

**Welcome**

Date :8/18/2000 Poster : Steve Ward

Welcome to our User's Discussion Forum. We are providing this forum as a means of information exchange for educational purposes. We are happy that so many of you are interested in sharing ideas about advanced ways to use our products. You are encouraged to share not only interesting techniques, but new and exciting applications of artificial intelligence. Thank you for your continued support of our products. Steve Ward, CEO.

**End of day**

Date :8/22/2000 Poster : Marco Racca

I am trying to have my trade closed at the end of day since I use only intraday data and daytrade the SP500, any help?

**Re: End of day**

Date :8/23/2000 Poster : Eric L. Hoyle, CFA

I'm not sure if this is what you are looking for, but there is a section on the web site that address how to close out trades at the end of the day using rules in the Trading Strategy. The address is: <http://www.neuroshell.com/daytrader.htm> . If that isn't what you're looking for, and you give me a few more details, I'll try and help.

**Re: End of day**

Date :8/25/2000 Poster : Daniel Lyons

On 8/22/00 Marco Racca wrote: I am trying to have my trade closed at the end of day since I use only intraday data and daytrade the SP500, any help?

Marco, one way of solving this is to add a rule that checks for and terminates any open trades at a specific time in the day using the time and boolean functions. These functions are available in the Day Trader Professional. Or write a custom function that is called as a DLL.

Kind regards,

Daniel

**Re: End of day**

Date :1/30/2001 5:41:18 PM Poster : Maciej

The way I do it is to program an exit using the Time functions and when time is one bar before the close of the exchange, in my case for the mini-Nasdaq 16.15 therefore at 16.10 using 5 min bars I force an exit. Not very elegant as it does not handle an half day as we had recently but that happens rarely,

Regards

### **Which addon should I get?**

Date :8/24/2000 Poster : Maxwell Craven

I'm having a bit of difficulty understanding the addons, especially the adaptive indicators and the neural indicators. I never used NeuroShell 2, but I have studied backprop somewhat, but these nets seem totally foreign to me. Can anybody help me out? Any ideas on how they can be used? Any thoughts on which I should purchase? Cheers!

### **Re: Which addon should I get?**

Date :8/29/2000 Poster : Steve Ward

Fortunately, you don't have to understand the methods to use them. Here are what I believe to be the key characteristics:

Adaptive Net Indicators - they do pattern recognition much like a human would. They actually compare new patterns to the training patterns. They are pretty good for classification.

Neural Indicators - they have backprop architectures, but weights are found by genetic algorithm instead of backprop's gradient descent algorithm. The recurrent nets "look back" in the data. Most important to me, they don't predict anything; they just give buy/sell signals directly.

Adaptive Turboprop 2 -Like the Prediction Wizard in the Trader, except capable of retraining automatically every N bars. Also, you can optimize outputs, just as with the other two types above. You can also optimize the training set size and the lookahead period.

I haven't found any one addon better than the others. None work all the time for all issues. However, I especially like the recurrent Neural Indicators; I often just feed them open, high, low, close, and volume.

### **Re: Which addon should I get?**

Date :9/8/2000 Poster : tb

Maxwell,

You aren't the only one having trouble keeping up with all of the new Ward products, what they offer, and how they fit together. I have been using Neuroshell2 for years and just started using the Trader. My company utilizes neural nets in some of our trading programs, generally employing GRNN and PNN style nets as opposed to nets based on backprop. They handle sparse data sets, train very quickly, and lend themselves well to trading problems.

The reason we started using the Trader is that Ward created "Adaptive Net Indicators", which is an add-on that essentially creates an indicator in a chart depicting the output of a GRNN or PNN network. The networks update themselves every bar, moving the training set forward one bar at a time so that the network is always up to date. It is very easy to set up trading strategies based on the value of the neural net "indicator", and we are able to export the indicator values to Trade Station 2000i if necessary.

If you use the Adaptive Net Indicators, try the "classify" category of nets. All you have to do is choose a meaningful combination of price based indicators and the package will create an output ranging from 1 to -1, indicating market strength or weakness. Simple trading strategies that get long at values above a given threshold (maybe .25 or higher) and flat when the indicator goes below zero work very well. Short sales would take place at a symmetric negative value and exit above zero.

Good luck!

### **Calling a dll**

Date :8/24/2000 Poster : chris wong

anybody used visual basic successfully to build indicators? i can't seem to get a vb dll working. have programmed a lot, but kind of new to vb and neuroshell. want to build several ideas i have into my chart.

### **Re: Calling a dll**

Date :8/29/2000 Poster : Ward.net Webmaster

Visual Basic won't make DLLs . It makes something called an ActiveX DLL, but that is misleading, because it isn't the same as a regular DLL. You can use Microsoft C to build a DLL, but we find that the PowerBasic compiler is a lot easier to use. Take a look at [www.powerbasic.com](http://www.powerbasic.com) and also take a look at the PowerBasic code we have provided in the Trader examples section of this site.

### **Signal triggered on bar 1**

Date :8/29/2000 Poster : Bruno Voisin

Hi, Have you noticed that if an indicator, say RSI(10), is used to for instance trigger a signal, it will be enabled from bar 1 even though it requires 10 bars to be calculated properly. This may lead to wrong optimizations. Some function equivalent to the EasyLanguage "MaxBarsBack" would eliminate such problem, I believe.

Your feedback would be much appreciated.

Bruno

### **Re: Signal triggered on bar 1**

Date :9/1/2000 Poster : Ward.net Webmaster

In the default chart formatting mode, the oldest data is not showing, so the RSI will be enabled from the first bar SHOWING on the chart. However, there can be many bars earlier than those on the chart that indicators can use for their "build up". In other words, you can have data that is loaded, but not necessarily displayed. The indicator will be calculated on what is loaded. Is this perhaps what you are noticing?

### **Re: Re: Signal triggered on bar 1**

Date :9/4/2000 Poster : Bruno VOISIN

Hi, I may be wrong, of course, but it seems that for instance, a  $(MACD(x,y,z) > 0)$  logical condition or signal will always be triggered on bar 1 (first bar displayed), without taking in consideration the number of bars required to calculate the indicator properly.

### **Re: Re: Re: Signal triggered on bar 1**

Date :9/8/2000 Poster : Ward.net Webmaster

But it DOES take into consideration the number of bars required to calculate the indicator properly. Those bars are in the earlier data and are used in the calculation. They are just hidden from your view unless you format the chart wider. Indicators will not be calculated and displayed at all if they don't have enough previous data to compute them properly.

## General advice on using N.Trader Pro

Date :9/1/2000 Poster : Ian

I have owned and worked with NT professional since its first release, on a part-time basis, and would be interested in feedback on the questions below. I know it's a long list....feedback on any aspect useful. I trade primarily commodities (mainly grains and bonds). Sorry this is so long.

### Selection of instrument to study

1. I could do with more guidance on this item. For example it is often recommended to select data that is less influenced by fundamental forces, but stocks and commodities are all affected greatly by fundamental forces...what are the technical characteristics I should be looking for in deciding (e.g. is it the lack of a trend, or is it simply the maintenance of the same technical forces throughout the training and walk-forward periods? Or is it a broad range of both trends and non-trending periods?)

### Preprocessing

1. Is it necessary to do any preprocessing when feeding data into Neuroshell trader? E.g. In cases where one indicator may show a negative number for a buy and another a positive number for a buy, is it necessary to make all 'buy' inputs point the same way? How well do inputs with just a binary 1 or -1 value help? Might such an indicator (showing the overall, long-term trend for example) be useful in a system primarily using oscillators for short-term

### Inputs

1. With indicators (e.g. RSI), is it enough just to feed in the indicator as is, or should I also feed in variations on it, e.g. the difference between today's and yesterday's value (to show direction), or difference between value and a certain constant (to show crossovers on a constant) etc. Does the adaptive turboprop do anything akin to these variations?
2. Related to 1 above, with the recurrent nets (add-in) is it less necessary to add lags of indicators since these nets retain some 'memory' of past values.
3. Did I read somewhere that binary inputs (e.g. 1 and 0, or 1 and -1 etc) are not well suited to neural nets like NT? Or is it only when the output is not binary as well?
4. Does it make sense to somehow sync the length of the output forecast with the length of the inputs? (i.e. if I am trying to forecast 5 days ahead, should I be looking for moving averages with 5, 10, or 15 as the lengths? And RSI with length of 5 etc)
5. With all the advice on the website and doc about using the momentum and volume indicators, has anyone found other categories useful? (Not asking for any secrets here, just a prod in the right direction).

### Training

1. Is it simply a matter of trial and error whether I go for multiple walk-forwards, optimize on training or walkforward sets etc? Is there an intelligent process I should go through to look for this?

### Outputs

1. Is it worth exploring a binary output that gives a 1 for open in x periods ahead being higher than current period, and -1 for it being lower?
2. Is it possible to find the optimal output...e.g. to see how many days in advance I should be predicting? Jurik talks about an 'optimal forecast distance', that was the idea I had in mind.

### Prediction Results, walk forwards etc.

1. I assume that to determine if I have a net that is potentially reliable enough to trade with I need to be looking for
- . Consistency of results in training and walk-forward tests
  - . Good results in both sets of data Am I correct?

### Overall Approaches

1. Has it been found useful to just throw all indicators in the package at a chart, and let the full optimization just find out the best indicators and values? I realize this would take a lot of computer time...
2. Is it useful to first of all take 1 indicator on its own and try all sorts of training criteria, outputs etc and just see what the best result is that I can get, then go on to the next indicator and do the same, and eventually use this process to identify the best outputs and criteria before putting a whole slew of indicators in and letting the optimizer sort out the best combinations and values.

If you are still reading....Thanks!!!!

**Re: General advice on using N.Trader Pro**

Date :9/7/2000 Poster : Steve Ward

I'll respond to three of your questions that I feel have clear-cut answers. The others are part of the art and can be argued many ways, so I'll let some other users give their opinions on those.

>1. Is it necessary to do any preprocessing when feeding data into Neuroshell trader? E.g. In cases where one indicator may show a negative number for a buy and another a positive number for a buy, is it necessary to make all 'buy' inputs point the same way?

No, not necessary.

>2. Related to 1 above, with the recurrent nets (add-in) is it less necessary to add lags of indicators since these nets retain some 'memory' of past values.

Yes, it is less necessary, unless you want to look back more than say 5-12 bars. The Lag indicators in Adaptive Net Indicators, however, can look back arbitrarily far.

>2. Is it possible to find the optimal output e.g.to see how many days in advance I should be predicting? Jurik talks about an 'optimal forecast distance', that was the idea I had in mind.

You can apply the optimizer to this task if you have one of the following addons: Adaptive Net Indicators or Adaptive Turboprop2. Both of those can optimize not only the output indicator parameters, but how far ahead the lookahead is.

### **S&P forecasting**

Date :9/2/2000 Poster : John Crisp

Has anyone had any success forecasting the S&P index? I would like a few tips on how to do this.  
Thanx John

### **Re: S&P forecasting**

Date :4/8/2001 9:12:35 AM Poster : NFred

I was successful until the break. Very difficult to design models that train on an uptrend and still work well in a downtrend. /fb

### **Re: S&P forecasting**

Date :4/9/2001 5:35:21 PM Poster : OmaSteak

Hello, I've been able to do a weekly SPY buy/sell point forecast that has worked and continues to work pretty well. While I can't give you the specifics of my indicators, it involved an exponential moving average and a measure of the differential between the projected buy/sell point and the ema value. You can see the results posted at [www.powerindexing.com](http://www.powerindexing.com).

### **S&P index prediction**

Date :9/3/2000 Poster : John Crisp

Could someone please advise me on the data variable for the input and the indicators that I should be using. I am very new to this and would very much appreciate any help forwarded. Thank you. John Crisp

### **Re: S&P index prediction**

Date :9/5/2000 Poster : Ian

Hi John,

I am no expert on this but have you looked into the most obvious?

1) the S&P examples contained in the product 2) the momentum and/or volume indicators (as mentioned in help and on tips at the web site) 3) example in Gateley's book where he uses several other data items (e.g. CRB index, treasury Bill index etc) 4) if you have NT Pro you can very quickly optimize and test whole groups of indicators to get ideas (from the contribution factors) which ones are likely to help you most

You need to have an idea of what you want to forecast (price changes for example, not absolute prices) and the time frame....it will be a long slog unless you have an idea that shows promise outside the neural net first. Oh....and the training data needs to have similar characteristics as the 'live' data.

Let me know if you would like to collaborate **Ed: on this forum, please**...as I say, I am no expert, but two hands could be better than one. Ian

### **Re: Re: S&P index prediction**

Date :9/7/2000 Poster : Eric L. Hoyle, CFA

How about 3 hands? I would be interested in collaborating on a project in this forum. I found that one of the best things about the Ward Sessions in Florida was the sharing of ideas and techniques. It would be great if we could get that kind of exchange going here. It would **REALLY** be nice if we had some way to share files/charts..... (hint, hint)

**Ed: please see the post concerning sharing files**

Eric

### **Re: Re: Re: S&P index prediction**

Date :9/10/2000 Poster : Ian

John, Eric and anyone else who wants to take part...how about this as a proposal?

I think we need to work through the following items. Lets agree on question 1 first and then



proceed. We could split the work between us if you like. I am sure Ward Systems will be watching and hopefully advising us on how best to proceed...

1. Choose a data instrument to analyze - I think we have chosen the favorite, SP500, but does anyone have a preference to the SP500 futures or the actual SP500 Index? I have extensive histories of both, I can share them if needed.
2. Decide what target to predict and time period - e.g. percent change in close, simple up or down in x days (ie binary indicator), or a derivative indicator such as the direction of the average of the close etc. I am happy for us to concentrate on any or all of these...I have been particularly interested in the binary one, but am happy to look at any of them.
3. Decide on best inputs - I do have the NT Pro and therefore could use the optimizer to help us identify good ones. I also have an extensive range of indicators in Tradestation that I would like to add to the mix. I assume we are heading for a range of about 5 or 6 indicators that are not closely correlated, I think I also have some software that can help us mathematically measure correlations.
4. Decide on training parameters (i.e. how many and how long walk forwards, when to retrain etc).
5. Sell our holy grail for \$5k a time - no just joking.....
6. I have many of the NT add-ons and would be happy to use any of those to add to the mix...

Thats all for now, if everyone is in agreement with these steps we should star with 1 and 2 (2 might need some discussion)...lan

**Re: Re: Re: Re: S&P index prediction**

Date :9/12/2000 Poster : Bruno VOISIN I am interested in taking part in this little project. Bruno On 9/10/00 lan wrote: John, Eric and anyone else who wants to take part...how about this as a proposal? I think we need to work through the following items. Lets agree on question 1 first and then proceed. We could split the work between us if you like. I am sure Ward Systems will be watching and hopefully advising us on how best to proceed...

1. Choose a data instrument to analyze - I think we have chosen the favorite, SP500, but does anyone have a preference to the SP500 futures or the actual SP500 Index? I have extensive histories of both, I can share them if needed.
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Thats all for now, if everyone is in agreement with these steps we should star with 1 and 2 (2 might need some discussion)...lan

=====

**Re: S&P index prediction**

Date :9/12/2000 Poster : lan

1. Choose a data instrument to analyze - I propose that we do the straight S&P500 index (symbol SPX), its easy to add others on later. Next stage is..
2. Decide what target to predict and time period -I will work on four main approaches, namely i) try to use Jurik's optimal forecast horizon to assess how far in the future to predict (and pick something like percent change in close), either creating this OFH in Tradestation and feed it through to NT or

try to create it in NT... ii) use the various add-ins (e.g. Adaptive Net Indicators) to optimise the output period iii) create a binary (i.e. buy or sell) output, or maybe this is really the trading strategy rather than the target output. (comments?) iv) use a good old favorite, namely 5 days percent change in close

I will create 4 separate charts.

This will keep me busy for several days, after which I will report back on this thread and then we can move onto the indicators/prediction inputs.

Does anyone have any alternative suggestions, or other lines they would like to follow up?  
Ian.

### **Re: Re: S&P index prediction**

Date :9/27/2000 Poster : Justin Word of caution: Be sure that the data you are going to use is virtually error free, this can be a daunting task. Before using any data files in Trader I check the data against a minimum of two other sources to ensure its integrity. I have first hand experience with data files from a commonly used eod provider being inaccurate on many occasions, in many markets. On 9/12/00 Ian wrote:

1. Choose a data instrument to analyze - I propose that we do the straight S&P500 index (symbol SPX), its easy to add others on later. Next stage is..
2. Decide what target to predict and time period -I will work on four main approaches, namely i) try to use Jurik's optimal forecast horizon to assess how far in the future to predict (and pick something like percent change in close), either creating this OFH in Tradestation and feed it through to NT or try to create it in NT... ii) use the various add-ins (e.g. Adaptive Net Indicators) to optimise the output period iii) create a binary (i.e. buy or sell) output, or maybe this is really the trading strategy rather than the target output. (comments?) iv) use a good old favorite, namely 5 days percent change in close

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Does anyone have any alternative suggestions, or other lines they would like to follow up?  
Ian.

### **Re: Re: Re: S&P index prediction**

Date :10/1/2000 Poster : Michael

I spoke with Steve Ward last year, and he suggested using the % change in Open, rather than close. I tried a few nets either way, and the open price seems to give a better predictor in volatile markets.

You're planning to give a binary output for trading. Two thoughts on binary versus analog output. 1) neural nets don't generalize well when forced to yes/no, true/false answers or predictions. We live in an analog world. 2) It will be extremely difficult to compare the possible returns between two alternatives with a binary number. If we predict % change in close, then we'd like to move into the investment which has the most % change. I suggest that a comparison tool between alternatives be the goal, rather than a binary yes/no.

### **Re: Re: Re: Re: S&P index prediction**

Date :10/4/2000 Poster : JM

I agree with Michael. I've tried many months using binary output and the result has been very disappointing. Generally, my experience with NST is that it is better suited to predicting an

analog output. Why not try predicting some good indicator values, esp oscillators, that will have a positive impact on our trading rather than predicting price itself?

**Re: Re: S&P index prediction**

Date :10/23/2000 Poster : kc yeong Hi, I would like to say I'm in but I do not trade US markets. I'm interested to know more about point 2(i) below regarding Jurik's OFH. Is it an addin? Can it be created in NT Pro from scratch? I've read about it and would like to find out more about it.

Thanks, KC On 9/12/00 Ian wrote:

1. Choose a data instrument to analyze - I propose that we do the straight S&P500 index (symbol SPX), its easy to add others on later. Next stage is..
2. Decide what target to predict and time period -I will work on four main approaches, namely i) try to use Jurik's optimal forecast horizon to assess how far in the future to predict (and pick something like percent change in close), either creating this OFH in Tradestation and feed it through to NT or try to create it in NT... ii) use the various add-ins (e.g. Adaptive Net Indicators) to optimise the output period iii) create a binary (i.e. buy or sell) output, or maybe this is really the trading strategy rather than the target output. (comments?) iv) use a good old favorite, namely 5 days percent change in close

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Does anyone have any alternative suggestions, or other lines they would like to follow up?

Ian.

**Re: Re: Re: S&P index prediction**

Date :10/24/2000 Poster : Justin Brundage

Try [www.jurikres.com](http://www.jurikres.com) , that is the Jurik Research website. I have tried to contact him in effort to explore him writing some of his indicators for use in NT Pro. I have not heard back. I own some of his indicators for Tradestation, but I do not get the benefit of optimizing with the GA. Maybe if others express an interest to him as well it would help. The indicators are fantastic.

**Re: Re: Re: Re: S&P index prediction**

Date :10/27/2000 Poster : Victor Chu Hi Justin, I think the only useful product by Jurik Research is JMA (Jurik's Moving Average). They have implemented this as a DLL and it can be used as a AddOn to Trader. I do not find the rest of their products like CFB and WAV useful. Best Regards  
-Victor Chu

**Re: Re: Re: Re: Re: S&P index prediction**

Date :10/30/2000 1:20:18 PM Poster : Justin Brundage  
Victor,

I appreciate your thoughts and opinions. JMA, and RSX, can be great indicators. How would I go about using JMA as an add-on? I have no experience with DLL's. Would I get full use of the GA optimization using JMA in this way?

Thank you,  
Justin

**Re: Re: Re: Re: Re: S&P index prediction**

Date :10/31/2000 9:35:58 AM Poster : Daniel P Lyons Hi Justin, I have implemented Mark Jurik's JMA as a DLL. It is pretty good but to get the full advantage of any tools, first try to understand how to implement them. For example, if you create a MACD using a JMA for the fast curve and a

simple moving average for the slow curve you will get a better MACD than the traditional ones because in this type of indicator you want to take full advantage of lag and JMA will allow you to do this. To call the DLL via your own code (assume c or c++) is very easy. You can optimise settings used in JMA using the genetic algorithms in DTPro although you will want to understand more about the outputs you are seeking first. Best regards, Daniel

**Re: Re: Re: Re: Re: S&P index prediction**

Date :10/31/2000 2:15:05 PM Poster : Justin Brundage Daniel, I appreciate your input, however you will have to excuse my ignorance, I understand the use of JMA, I just have no idea how to get it into NST. Where would I get the JMA DLL? How do I get it into NST? I don't have my own code. Are there any resources that you know of that would show me how to call a DLL from NST? Thanks, Justin

**Re: Re: Re: Re: Re: S&P index prediction**

Date :10/31/2000 5:37:14 PM Poster : Daniel P Lyons

Justin, you need to purchase JMA as a DLL from Mark Jurik at: [www.jurikres.com](http://www.jurikres.com) To call the DLL from NST, you will need to place the jrs\_32.dll in the template directory and use the array method to create the template in NST. You can also write your own DLL that calls JMA as part of a more complex indicator. I hope this helps, kind regards, Daniel

**Re: Re: Re: Re: Re: S&P index prediction**

Date :11/1/2000 2:08:52 PM Poster : Ward.net Webmaster Maybe we can clarify. By "array method", Daniel Lyons means the indicator "External DLL Call by Array", which is in the "External DLL Calls" category. You give this indicator the DLL's calling parameter types and default values, and then the Trader Professional makes a custom indicator that makes calling the DLL possible. The custom indicator is stored as a .tpl file in the Template Folder of the Trader folder. You can even specify a category you want the custom indicator to show up under. You are allowed to share your .tpl files with others as you wish, just as you can share charts. This is the method by which all of our add-on vendors supply their indicators to users in DLL form.

**Re: Re: Re: Re: Re: S&P index prediction**

Date :11/2/2000 8:48:41 AM Poster : Justin Brundage

Thanks to both of you for your assistance. -Justin

**Re: Re: Re: Re: Re: S&P index prediction**

Date :1/17/2001 1:48:53 PM Poster : TROY BONIN IS THERE ANY POSSIBILTY YOU ( OR ANYONE ELSE) WOULD CONSIDER SHARING YOUR .TPL FILES FOR JMA AND RSX?

**Re: Re: Re: Re: Re: S&P index prediction**

Date :1/18/2001 7:50:01 AM Poster : Victor Chu

Hi Troy, I am not sure if you call RSX from NS Trader since Jurik has not implemented as a DLL, but I can certainly share my TPL file for JMA. I wonder if Daniel has used JMA to smooth any indicator other than MACD with success.

Thanks  
Victor Chu

**Re: Re: Re: Re: S&P index prediction**

Date :9/12/2000 Poster : Eric

Ok, here are my thoughts:

1. The SP500 is fine with me. I would lean towards the Index instead of the Futures, just to avoid the "expiring contract" issue, but I can't say that I really care that much.
2. On the issue of what to forecast, I've always felt that was a tricky question. I've thought a lot about,

but I can't say I have any good answers. I was never real happy with "%change over a period of time". I've always wanted to capture sustained moves and simple percentages don't always do that. The path that Stock X took to gain 10% in 20 days I think is important. Was it up 5% in 10 days or down 50%. You can use derivatives to get around a lot of that, but I've never been real happy with those results either. I can eyeball a chart and say where I'd like to buy and sell, but I'm not sure how to quantitatively model that... I one time tried optimizing a trading strategy, giving it the future values and adjusting the trading costs to see what it gave me as buy and sell points, but once again, no holy grail. I guess this is a long way of saying "I don't know." I would like to know your thoughts on the binary indicator and what you're looking for the model to predict.

3. I'm working with NDT(?) Pro, the day trader version, with Tradestation, which I bought 1 month before Omega announced they were "changing" to a web site version..... (I'm not real happy with Omega, but I'll hold judgement until I see what they release.) But as far as NT is concerned, I can work with either the intraday or the end of day depending on what everyone else has.
4. I'll leave the training parameters alone for now, but I think that deserves a lot of discussion.

So that's my 2 cents. Let me know what you think about #2.

-Eric

### **Re: S&P index prediction**

Date :9/14/2000 Poster : Ian  
Eric,

In answer to your question..

>> I would like to know your thoughts on the binary indicator and what you're looking for the model to predict.

my answer is that I have wanted to research first setting up indicators at the 'ideal' tops and bottoms (maybe by using a zig-zag indicator), and then see if there are a good combination of indicators that predict those points well. I am sure many have tried that before, but I guess I have to learn for myself! Also, I realise the zig-zag indicator cannot be used realtime, but I just want to use it for training the net. Meanwhile, I am setting up all the other parameters mentioned in previous posts and I will be in touch. Ian.

### **Re: Re: S&P index prediction**

Date :9/15/2000 Poster : Olli  
May I join in?

Finding out what to predict seems to be one of the most important keys to success in predicting. I have found out, that this depends on the market, the behaviour of which you are trying to predict. The percent change works fairly well in currencies, where trends tend to be longish, but not that well with the SP500 or any other more fluctuating market. So my idea is that you would need to have to compile something, which 1) would tell you the direction and give an estimate of 2) the magnitude of the expected move and which would 3) not lag the market too much, otherwise you are trying to predict the past or the present movements, not the future.

The real outcome of trades is of course most dependant on your exit strategies, but I would be grateful of finding better entries as well.

Any thoughts?

### **Finding out what to predict**

Date :9/20/2000 Poster : Steve Ward

I couldn't agree with Olli more. Here is a very typical comment we've received through the years: "I have just changed my output and now I'm getting great results." We've

heard this in scientific applications as well as financial. Remember that neural net outputs do not have to be just price, change in price, or percent change. You can predict any standard indicator or one you custom build. One idea to get you started is already posted on this site under tips and techniques called Normalizing Network Outputs.

**Re: Finding out what to predict**

Date :9/21/2000 Poster : Ian

Thanks to Olli and Steve for the ideas, I will be working on some output ideas this weekend, including the Ruggiero example referred to. I thought I would first take a simple net and keep the input the same try the different outputs to see what happens....for me at least this is already a very useful forum. I will send the results of my work back to the forum in the next 4 days or so. Ian.

**Re: S&P index prediction**

Date :10/2/2000 Poster : Tom Gamon

John:

As an alternate to modeling the S&P500 index you might consider SPY ADR's traded on the AMEX. They have enormous liquidity as they are one of the most actively traded issues on the the exchange. I have had good success modeling it (over an out of sample of the last 2 years) by using Predict4 AdaptiveNet Add In Not Turbo Prop 2) . just using the Open, High, Low, Close. However, I have not traded it, but will follow the signals for a while.

Good Luck,

Tom Gamon

**Re: Re: S&P index prediction**

Date :10/4/2000 Poster : Ian

Good idea, especially as the ADR's (on any of the indexes) can actually be really traded. Have you tried the technique detailed below with ratio-adjusted data also. as opposed to the raw data? Ian

**Re: Re: S&P index prediction**

Date :10/11/2000 Poster : Steve Ward

This sounds like pretty good advice to me, and I am already aware that Tom knows what he is doing. Others, please post if you also have success with SPY ADRs.

**Re: Re: Re: S&P index prediction**

Date :10/12/2000 Poster : JM

Hi all,

Can someone please advise me what is the SPY ADRs? What does ADR stand for and is there a futures contract on it? If there is, what's its symbol? Thanks!

JM

**Re: Re: Re: Re: S&P index prediction**

Date :10/13/2000 Poster : Eric L. Hoyle, CFA

Someone check me if I'm wrong, but ADR stands for American Depository Receipt, a vehicle used most often for trading share(s) of foreign companies on an American Exchange. However, the SPY are actually more similar to a tradeable mutual fund that has been created to mimic an index. The SPY is supposed to track the S&P 500, while DIA (Diamonds) should track the Dow Jones Industrial. There are a lot more, but you get the point. They are traded throughout the day on the Amex, and I don't believe they're subject to the up-tick rule for short sales. You can read more about them at

www.amex.com. Look under "Index Shares" and then again under "Broad based Indexes". I don't know if they trade futures on them, however, I would be very surprised, since you can trade futures on the underlying index they're supposed to track.

Eric

**Re: Re: Re: Re: S&P index prediction**

Date :10/13/2000 Poster : JM

Thanks Eric. Your post is very informative. It seems the US trade almost anything under the sun :) By the way, would it be too much if you can kindly explain about the uptick rule for short sale? I come from a country where short sale is strongly discouraged and short position must be closed within the same day. Thanks in advance!

JM

**Re: Re: Re: Re: Re: S&P index prediction**

Date :10/16/2000 Poster : Eric L. Hoyle, CFA

Again I'm not an expert, but generally, the uptick rule says that if you are going to sell a security short, the trade must be conducted at a price above the previous price (an uptick) or at the same price. However, the trade can only be conducted at the same price if the previous price was itself an uptick. It's designed to prevent short sellers from driving down the market. There are other rules for NASDAQ, where you are dealing with Market Makers, but the intent is the same. I did a quick search on Yahoo and found this explanation if you want more specifics: <http://www.directaccesstrader.com/short.htm>. Good luck.

**Re: Re: Re: Re: Re: S&P index prediction**

Date :10/16/2000 Poster : JM

Thanks so much again, Eric. Now I understand. Good trading to you!!

### **DayTrader Pro - question about misprints**

Date :9/5/2000 Poster : Jimmy Raineri

I just started using DT Pro. It's a great package. I have a few questions, but let's take one at a time:

1. How does it handle misprints? It seems to me that quote.com only sends corrections (cancels) - and I noticed today that DT Pro didn't adjust the corresponding bar properly. For example, during a 2 minute bar the low price was 10.00 and the high was 20.00. 2 minutes later a cancel is made for the only trade at 20.00 and it is resubmitted at 15.00 -leaving the high trade for the previous 2 minute bar at 12.00. DT Pro still shows 20.00 for that bar, and I assume it trains and optimizes based on that incorrect price.

That leads me to a general question about misprints - is there any way within DT Pro that I can "see" these misprints and create an indicator based on them? It seems obvious that these "mistakes" are made to manipulate the price of a stock.

Thanks.

### **Re: DayTrader Pro - question about misprints**

Date :9/5/2000 Poster : Jimmy Raineri

A little typo above - resubmitted at 12.00 - not 15. <G>

### **Re: Re: DayTrader Pro - question about misprints**

Date :9/12/2000 Poster : Ward.net Webmaster

We'll look into whether the cancels that you see on Qcharts are coming into our feed too, and whether they can be handled. In the mean time, you can manually correct any data point in the Trader. Please look in the videos in the section called Formatting a Chart, and the video is called Modifying Raw Data. This technique works with the DayTrader as well as the other versions.

### **Re: Re: DayTrader Pro - question about misprints**

Date :9/12/2000 Poster : Ward.net Webmaster Our programmers now tell us that NeuroShell DayTrader Professional is indeed programmed to correct the chart when quote.com sends corrections. This may appear not to be the case, however, because:

1. The DayTrader doesn't make the bad part of the bar turn red like Qcharts does.
2. Different servers have slightly different data. If NeuroShell DayTrader Professional is connected to a different server than QCharts, there is a good chance that the data will vary between the two programs (Open, High, Low, Close, and Volume have been observed to be different). If you can capture evidence that data correction isn't working, we'd like to see it. Please forward details to support@wardsystems.com. With regard to building an indicator, it is not possible at this time, but it will be added to our ideas list.



**Re: Re: Fuzzy Logic and Neural nets**

Date :9/8/2000 Poster : Ian

Thanks Bruno, I'll to see if I have my old Neuroshell 2 disks...Ian

On 9/7/00 Bruno VOISIN wrote:

In my view, neural nets are also good fuzzy logic operators. I would use Kohonens (unsupervised learning) or Probabilistic nets (supervised learning) to do classification, the way a fuzzy logic preprocessor would. I don't know of any FL add-on for NSTrader though.

Bruno

On 9/5/00 Ian wrote: I am interested in opinions as to whether I can create systems within NT pro (incl add-ins) that cover fuzzy logic approach? or if indeed anyone feel that is worthwhile to explore.

Thanks. Ian.

**Re: Re: Re: Fuzzy Logic and Neural nets**

Date :9/12/2000 Poster : Bruno VOISIN

Ian, The discussion can go much further. It is always funny to send a message to the FL newsgroup and tell them that everything FL does can be done by neural nets. You can expect some interesting backfire. To my (modest) knowledge though, almost everything can be done using classification nets, and you may be better off buying the Ward add-ons, than using NeuroShell 2.

FL however may give you a more targeted approach (based on fuzzy rules), hence tends to give more productive results, a little quicker. You may want to take a look at [some FL products](#). I would myself stick to the Trader and try to add on to the existing platform.

Bruno

**Re: Fuzzy Logic and Neural nets**

Date :9/12/2000 Poster : Ian

Bruno and Steve,

Thanks for the comments on fuzzy logic, I have all the Ward NT add-ins so I will be trying to use them (on the S&P index prediction thread in fact). I would love any guidance you have on those...maybe as part of the Index thread? I was wondering if you think NT could basically offer good inputs of the FL sort....Ian.

**Re: Re: Fuzzy Logic and Neural nets**

Date :9/12/2000 Poster : Steve Ward

I agree with Bruno that neural nets contain all the fuzziness you need. Note that NeuroShell 2 nets can be called from the Trader Pro or DayTrader. However, if someone really wants to build a fuzzy logic engine in a DLL or our DataX add-on, wouldn't that be a nice add-on they could sell? For those that own GeneHunter, there's a great (but complicated and undocumented) Fuzzy Logic example on ward.net.

**Re: Re: Re: Fuzzy Logic and Neural nets**

Date :9/12/2000 Poster : Ian >>For those that own GeneHunter, there's a great (but complicated and >>undocumented) Fuzzy Logic example on ward.net.

Hi Steve,

I do own Genehunter (it will be in your records!)...but cannot find the disks with the serial #...so I cannot immediately access that example, could that be put in the file sharing area? Or could someone outline the main aspects of that example? Also...can the same be achieved with the NT Pro optimising capability? Ian

**The GeneHunter Fuzzy Logic Example**

Date :9/13/2000 Poster : Steve Ward Ian: We'll handle the serial number problem thru tech support

channels. I don't know offhand why you couldn't use the Trader GA by coding the fuzzy engine in a DLL, but I'd do a little test first if I were you. Meanwhile, here is all the documentation we made:

**Solving Fuzzy Logic Problems Using GA-generated Fuzzy Membership Function Parameters**

It is possible to solve problems using fuzzy logic, even if you don't know the proper shape of the fuzzy membership functions (triangles or trapezoids). You can let the genetic algorithm find an optimal set of fuzzy regions (i.e., the membership triangles). You can download two Excel examples of this below. We have actually programmed the fuzzy logic "engine" into Excel, then used the GA to find the optimal membership triangles. The first example, fuga\_1n.xls, is a fuzzy logic example which seeks to approximate a parabolic shape, just as a neural network might do. The example is a fuzzy logic engine that takes an x value and generates the function value  $y=1.6x^2 - .8$ . The GA optimizes the form of the membership triangles to achieve the best approximation. (Obviously, the NeuroShell Predictor can do a much better job of such an approximation, but this is just an example.) In the second example, fuga\_3d.xls, we built a fuzzy approximator of the function  $z(x,y)=.5(x+y)$ . **WARNING:** These examples are very, very, difficult to understand and we have not documented them. They are beyond the capabilities of most of our users. Do not even attempt to understand them unless you are very good at Excel and you understand fuzzy logic. We offer them AS IS, with NO TECHNICAL SUPPORT, for anyone interested in building hybrid GA-fuzzy systems. The hardest part about them is understanding how we have built the fuzzy "engine".

**Re: The GeneHunter Fuzzy Logic Example**

Date :9/14/2000 Poster : Ian Steve,

Thanks for the follow up on this detail, I will contact the tech support people to get access to the examples. Ian.

1. Create an archive file, either zip or exe, which contains all relevant files, including \*.cht, \*.tpl, \*.dll along with any necessary data files. Please try to make your file as small as possible.
2. Send your archive file as an attachment to [forum@ward.net](mailto:forum@ward.net)
3. After review, we will upload your file to our server.
4. Within the body of your post to this forum, make a note indicating that you have sent a file to us. We will then insert a link to your file, so that others may download it. Please only send example files and NOT problem files. If you have problems with your charts, please send those to [support@wardsystems.com](mailto:support@wardsystems.com). We would like to keep this forum as a means for users to share ideas and not for tech support.

### **Re-Optomising and Re-Training**

Date :9/10/2000 Poster : Nick Ali

Is there any way of preventing certian parameters being re-trained or even giving uper an lower bounds. If you have a system based on say a couple of nets do you have to go into each net and re-optomise and train?

Many  
thanks Nick

### **Re: Re-Optomising and Re-Training**

Date :9/12/2000 Poster : Bruno VOISIN Any parameter range can be set prior to optimising. You may set the parameter range to nil (i.e. lower bound = upper bound) to prevent the genetic optimiser from "touching" it.

Bruno

### **Optimizing Trading Strategy**

Date :10/5/2000 Poster : kc yeong Hi all! I've just got Neuroshell Trader Pro recently and found it to be a very flexible software. I have used Metastock before that. As I was using the trading strategy wizard, I've got some results that I do not understand. Thought I'd post it here and hopefully, someone may have an answer. It concerns the trading rule selection option. My objective is to optimize a simple moving average system. So, I ran the wizard with a range of parameters (5 to 100 in steps of 5) and ask the wizard to select one rule for simple moving average crossover above and one below. And I set the wizard to buy or sell when one of the conditions is true. Funny thing is that after optimizing, the software returned more than one buy conditions. Now, this confuses me. If I choose one buy condition, why does it return multiple conditions? In this case, the trading statistics will be calculated based on these multiple buying rules, true? Any ideas? Regards, KC

### **Re: Optimizing Trading Strategy**

Date :10/6/2000 Poster : Ward.net Webmaster When you choose one buy condition, you are saying that if any one of the many conditions is true, then buy. If you selected full optimization, then the genetic algorithm may delete some of the conditions, but it could still leave several there. Remember, it will buy when any one of those left is true. If you really want only one rule possible, enter it and then do parameter optimization to find the best parameters for that one rule. Does this explanation help?

### **Re: Re: Optimizing Trading Strategy**

Date :10/7/2000 Poster : kc yeong Thanks. I understand now. In the midst of juggling several things at the same time besides working on NST, I've mistaken rule optimization for parameter selection.

### **Re-optimising doesn't re-optimising**

Date :10/6/2000 Poster : Paul Fowkes I have a chart which uses two data streams in a strategy (ie it's non-neural, no prediction) to issue buy/sell orders for day trading SP. I created a chart from scratch and got some good results after optimisation (parameter) on the long-side but had mis-typed one of the short-side parameters.

I then updated my short-side parameters and can not get the thing to re-optimize at all. It simply ends up with the same trading stats that it starts with - even after running for half-an-hour (PIII 800MHz). I've tried everything I can think of (changing parameter ranges, deleting re-adding them etc) but it never changes the results. They're always the same as it started with. Any ideas what I'm doing wrong?

I have built many other strategies/predictions etc and never seen this behaviour before. Normally if a change something and then re-optimize, the results change as you watch it run and you end up with something different. Help.

### **Re: Re-optimising doesn't re-optimising**

Date :10/11/2000 Poster : chris wong you indicate that the re-optimization was running for a half hour. maybe it was trying to find another solution but just kept coming up with the same one? i'm no expert on this, but maybe the optimal solution was the same for both sets of short side parameters you used?

## How to detect the NN optimal model

Date :10/6/2000 Poster : Peter Hoon Here are some ideas for traders seeking to detect the optimal model, and avoid over fitting in NT.

Basically, the strategy is to test the model varying the number of hidden neurons you use, while you keep a table of statistical quantities, which are printed out in "Prediction Analysis".

Background I have developed my own forward leading smoothed target, based on domain experience and graphical analysis, about 4 periods ahead, and am seeking to develop an optimal model to predict it. Using GA, trial and error, and visual graphics, I came up with a prediction model for it that has good "fit stats". I selected "no trades" while building my model. I am just working on model building at this time; later, I will build a trading system around this "leading indicator", designed to pick intermediate tops and bottoms. These data are based on an out of sample of over 1600 bars, made up of the OOS evaluation portions of three walk forwards. The training and each walk forward produced virtually identical fit stats for this model, a very encouraging sign that the model is robust. The columns listed are consecutively: number of hidden neurons in training and optimization (always kept the same), the average error, the r, the R sqd, MSE (mean squared error), and percent correct sign. The second row is the % contribution respectively of three indicators: RMI(close, 3, 7), Williams %R(High, Low, Close, 8) and Waveletvaldaub12(close, 8, 2).

The parameters for these inputs remain the same for each different number of hidden neuron models when optimization for parameter input is chosen (keeping all the inputs). I get the same numbers below when I choose different objectives: Max R sqd, Min MSE, Max r. This also is an encouraging sign that the model is robust. I get virtually the same numbers below when I check "balance upward and downward trending market sections".

	Hidden	Avg Error	r	Rsqd	MSE	%correct sign	(%contrib.)	(%contrib.)	(%contrib.)
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Neurons

.	0	11.4	.818	.669	192.0	100	(47.57)	(47.26)	(5.16)
.	3	11.4	.818	.668	192.2	100	(79.39)	(16.68)	(3.93)
.	6	11.4	.818	.669	192.0	100	(59.62)	(37.96)	(2.42)
.	7	11.4	.818	.669	191.9	100	(52.97)	(40.81)	(6.22)
.	8	11.4	.818	.669	192.1	100	(53.01)	(41.66)	(5.33)
.	9	11.4	.818	.668	192.2	100	(51.98)	(43.19)	(4.84)
.	12	11.4	.817	.667	193.2	100	(55.0)	(40.13)	(4.80)
.	15	11.4	.816	.665	194.1	100	(61.26)	(34.46)	(4.28)
.	20	11.4	.815	.663	195.1	100	(60.16)	(36.24)	(3.61)
.	25	11.5	.814	.662	195.9	100	(56.16)	(41.17)	(2.67)
.	35	11.5	.814	.661	196.5	100	(45.77)	(45.10)	(9.12)

I'll number my statements about the data above, so traders can offer their ideas and reactions:

- 1) A completely linear model works well, but introducing some non-linearity by adding a few hidden neurons seems to help. Note the slightly lower MSE with 7 neurons Vs. Zero neurons.
- 2) The best clues to possible over fitting and possible model instability come by examining the Rsqd and MSE columns.
- 3) The use of 7 hidden neurons seems about optimal. You get a fairly nice spread of relative contributions, the highest Mul R sqd, and the lowest MSE.
- 4) After about 7 hidden neurons, the MSE starts rising, Mul Rsqd starts dropping, suggesting over fitting and possible model instability. Also, the relative contributions are not as evenly spread (RMI starts "hogging" more relative contribution) after the model with 7 hidden neurons, particularly with 20 and 25 neurons.
- 5) The model with 35 hidden neurons is either approaching instability, or actually is unstable: Note the unexpectedly high contribution of wavelet, and the higher value of MSE.
- 6) When I remove the input with the smallest contribution, wavelet, the model still works well and has good fit stats. However, keeping the input, which provides some information about cyclicity in the target, seems intuitively a good idea. The other two main contributors are principally measures of

market momentum. Wavelet's presence in the model helps "spread" the relative contributions somewhat more evenly.

7) From breast cancer research using multivariate linear models, we often kept one predictor that had a relatively low contribution; it helped stabilize the model by acting as a "suppressor" variable, and it was often just at or slightly above the "F to enter or remove" level of statistical significance. Though it alone was not particularly important, we kept it because it slightly improved the overall prediction power of the model. This would be another argument for keeping wavelet in the model.

#### **Re: How to detect the NN optimal model**

Date :10/7/2000 Poster : Bruno VOISIN Hello Peter, Interesting exercise you have done. The 100% correct sign worries me a little though. Talking about wavelets, I have tried to use them on several occasions without much tangible success. Much of the signal remains in the residual, implying that the signal is not well captured by the waves. Some wavelet functions may be more appropriate as most of the common ones are simple not suitable for time series. In addition, I believe you should detrend your series rather than using the close. If you are interested in the topic, you may want to take a look at Prof. Murtagh's work on [www.multiresolution.com](http://www.multiresolution.com). His paper is available on <http://strule.cs.qub.ac.uk/~gzheng/financial-engineering/finpapermay99.html> And I have also re-written his VB program for faster computations. The original code is available on his site (<http://www.multiresolution.com/MTv2open.zip>) One question still: what financial issue are you trying to predict?

#### **Re: Re: How to detect the NN optimal model**

Date :10/11/2000 Poster : Maxwell Craven

It doesn't look like he used the close, although his "forward leading smoothed target" could be based on the close. Peter, can you tell us what your forward leading smoothed target was? The 100% correct sign most likely appropriate, because since the target is probably always large and positive, the prediction is probably always positive as well.

#### **Re: Re: How to detect the NN optimal model**

Date :10/23/2000 Poster : kc yeong Hi Bruno,

I've seen articles referring to Morlet wavelets as suitable for financial time series forecasting. They also mentioned that other wavelets are less suitable. In Prof. Murtagh's work, he used A'trous (spelled correctly??) wavelets. Can you tell me what is the difference between Morlet and A wavelet and how they are useful to financial time series forecasting compared to others?

#### **Re: Re: Re: How to detect the NN optimal model**

Date :10/27/2000 Poster : Victor Chu

Hi KC,

I do not find the Morlet and Gabor wavelet really usefully as they suffer from end point distortion. If they are used as inputs to a neural network the predictions in the middle of the charts are beautiful but future predictions on the right of the chart are terrible. (Perhaps the people at the Trader AddOn Product WaveFin have something to say about this).

Prof Murtagh's Reduntant Haar Wavelet does not suffer from the end point distortion problem. I have used the wavelets in two different ways

- (1) As a value to predict There have being a lot of discussion in this forum as to what to predict. To this I can add a new value to the list, ie Level 1 or Level 2 of the Reduntant Haar Wavelet. All the short term cyclic information resides in this two level and it can capture the market turning points quite well.
- (2) As inputs to Neural Trader While they are not exactly magic bullets, the Reduntant Haar Wavelet can produce good trading models if they are used as inputs to Trader as a set.

I have translated Prof Murtagh's work from VB and VC and have compiled it as a DLL to be used as a

Trader AddOn. I will be glad to post it on this forum if anyone wants it

Thanks to Bruno Voisin for informing me about Prof Murtagh's site.

Best Regards -Victor Chu

**Re: Re: Re: Re: How to detect the NN optimal model**

Date :10/27/2000 Poster : Steve Ward

Nice work, Victor! I'm sure many will be interested in that contribution. Please send the DLL and your .tpl file to the Ward.net Webmaster at forum@ward.net and he'll post it.

Victor Chu wrote:

I have translated Prof Murtagh's work from VB and VC and have compiled it as a DLL to be used as a Trader AddOn. I will be glad to post it on this forum if anyone wants it.

**Re: Re: Re: Re: How to detect the NN optimal model**

Date :10/27/2000 9:36:32 PM Poster : JM

Hi Vic,

Thanks for your most informative post. I am a newbie when it comes to wavelets, and currently studying about it. I have a few questions regarding your post and hope that perhaps you or any 'wavelets guy' here can help:

You mentioned: >(1) As a value to predict >There have being a lot of discussion in this forum as to what to predict. To this I >can add a new value to the list, ie Level 1 or Level 2 of the Reduntant Haar Wavelet. >All the short term cyclic information resides in this two level and it can capture the >market turning points quite well.

I have always been a proponent of predicting indicators rather than price itself and your suggestions really make sense to me. But after predicting the Level 1 or Level 2 of the Reduntant Haar Wavelet, how do you intend to use that in your trading strategy? You also mentioned that all the short term cyclic information resides in this two levels. How can you best extract this information? What kind of cyclic information resides here? Can you get the dominant cycle length out of this information? When you said it can capture the market turning points quite well, can I take it that the indicator makes a peak or a trough corresponding to market peaks and troughs? Or must I perform some more complex mathematics or interpretation to determine whether the wavelet is telling me that the market is turning?

You mentioned: >(2) As inputs to Neural Trader >While they are not exactly magic bullets, the Reduntant Haar Wavelet can produce >good trading models if they are used as inputs to Trader as a set.

What do you mean by "used as inputs to Trader as a set"? Is it multiple wavelets used as inputs with each wavelet having different parameters? Or does the Redundant Haar Wavelet comes with many different category of wavelets that works best together as a set? (Pls pardon my ignorance with regard to the Haar Wavelet if this question sounds stupid)

Thank you for your time and looking forward to your DLL :)

regards JM

ps: This forum is getting more and more interesting by the day.

**Re: Re: Re: Re: Re: How to detect the NN optimal model**

Date :10/30/2000 12:27:43 PM Poster : Victor Chu

Hi JM,

I really do not understand Prof Murtagh's Non-decimated Haar algorithm, or Wavelets myself and what I wrote in my last posting is based on visual observations of the outputs.

If you run Prof Murtagh's MTV2OPEN spreadsheet using the Non-decimated Haar option, you will be prompt for a "scaling number". If you enter 6 say, you will get 7 columns, Scales 1 to Scales 6 and a



column called Residues. The Scales values looks like oscillator type values in that it varies between some positive and negative values. I do not know why Prof Murtagh called his website [www.multiresolution.com](http://www.multiresolution.com), but I can see that the various Scales are "different levels of resolution" of the original time series. Scale 1 is a very high frequency time series and contains all the noise. You can observe that the peaks and troughs of Scale 2 and Scale 3 corresponds to the peaks of the original time series and hence contains the short term trend information. If you want to construct a "lead indicator" to tell the direction the time series is going, then Scale 2 and Scale 3 looks like a good value to predict. Scales 4 and higher contains the long term trend information. The use of the term "Level" in my last posting corresponds to the term "Scales" by Prof Murtagh.

Perhaps you can use my DLL to plot the various scales and levels to see what I mean. **You can download Victor's DLL and TPL in the form of a zip file by clicking [here](#). Unzip the file and copy the DLL and TPL file to your \NeuroShell Trader\Template directory. Note, all Trader packages can use templates, but only the Professional and DayTrader packages can create them.**

I have actually use Trader to predict Scale 3, using Scale 1 to Scale 6 as inputs, and Maximize Net Profit, Find Optimal Trading Rules, and (in my case) long positions only as Trader's options. The result is reasonable good for one stock that I tried, and "not bad" for the rest. As I have said, the inputs are not exactly "magic bullets". At Prof Murtagh's web-site, there is message that says, "beware, the denoising techniques used are rather quick and dirty". I take this to mean that the Non-decimated Haar algorithm is not the best of Prof Murtagh's techniques. Of course, you can also use traditional indicators as inputs, as long as the result is good.

By the way, the Residues values act as a good moving average cross-over model. It captures all the major swings, giving few whip-saws. It beats most other moving average models.

Thanks -Victor Chu

**Re: Re: Re: Re: Re: How to detect the NN optimal model**

Date :10/30/2000 8:07:08 PM Poster : JM

Hi Vic,

Wow, thanks for the info. Didn't know that wavelets can do all those neat stuff. Your post is great! Thanks!

regards JM

**Re: Re: Re: Re: Re: Re: How to detect the NN optimal model**

Date :10/31/2000 12:38:18 AM Poster : Bruno VOISIN

Hi,

We should maybe have started a separate thread, but any how, it does not really matter.

As far as I understand wavelets, there are strong similarities with FFT. The signal is decomposed into waves of different 'periods' which do add up to the original signal. I have my own Excel Add-in as you know, and I have used it so far with the good old NeuroShell 2. It does indeed give pretty good results in predicting long to medium trends (first scales), although not nearly as good when you try and predict the %change. Secondly, I am skeptical when I see most the signal sitting in the residual. Of course, this depends on the number of scales you are using, but it also means that the wavelet has probably not captured well the inner movements of the series.

I am very interested in testing it further though, and I look forward to reading your feedback on this.

Regards Bruno

PS: please excuse my 'approximate' English.

**Re: Re: Re: Re: Re: Re: How to detect the NN optimal model**

Date :10/31/2000 9:58:01 AM Poster : Daniel P Lyons

Hi Victor,

I tried to run the DLL version of the HAAR wavelet but kept getting an invalid page fault when attempting to implement it with another proprietary indicator I use. This does not use the close price so I suspect it is calling memory that does not exist. Is it possible to obtain the c source code to the DLL so I could try to debug the indicator I am using,

kind regards,

Daniel P Lyons

**Re: Re: Re: Re: Re: How to detect the NN optimal model**

Date :11/1/2000 12:08:18 AM Poster : Victor Chu

Hello Daniel,

I can certainly give you the source code I will send it to the web-master within the next few days.

I have used an integer to represent the size of array passed in, instead of a long. If the number of bars passed in is a few thousand, it should be OK. If it is above say thirty-thousand, an overflow error can happen.

Another thing you can do is to export the indicator to a spreadsheet and try to run it with the MTV2OPEN program. Does the program crash?

Thanks Victor Chu

**Re: Re: Re: Re: Re: How to detect the NN optimal model**

Date :11/1/2000 1:18:30 PM Poster : Daniel P Lyons

Hi Victor,

thanks for your prompt reply. I will export the indicator as you suggest.

Strangely enough, the crash only occurs in real-time hence my desire to see what is happening as the conflict could be caused from my indicator...although my indicator does not normally crash when used on its own.

I engaged the DLL on the December Nasdaq futures contract in 1 min, 5 min and 15 min charts. The 1 min chart does not have more than 30,000 points so should be within your limits. I will experiment further today and keep you posted.

Also, have you also used the ATrous algorithm from Prof. Murtagh's routines?

Finally, I sent a message to John Bonn (producer of Wavefin) to clarify the end point distortion issue from their perspective re:Gabor & Morlet wavelets. Shall keep you informed of any response.

Thanks again for your help.

kind regards,

Daniel P Lyons

**Re: Re: Re: Re: How to detect the NN optimal model**

Date :10/28/2000 2:10:52 PM Poster : b

Victor,

It would be a good idea to post Prof Murtagh's wavelet if you have already programmed it in C. I was meant to do it for some time. I think Prof F. Murtagh should be kept informed of this though.

Regards Bruno

**Re: Re: Re: Re: How to detect the NN optimal model**

Date :10/30/2000 1:58:48 AM Poster : kc yeong

Hi Victor,

Thanks for the info. I've read in Katz and McCormick's "Encyclopaedia of Trading Strategies" as well as Timorthy's "Neural, Novel and Hybrid Algorithm for Time Series Prediction" and both books

referred to Morlet's wavelet as use for financial filtering. I'm glad you cleared it up.

I'm also interested in the C source code. I've downloaded the fortran code from Prof. Murtagh's site but ran into some bugs when I tried to code it. Will really appreciate it if you can post yours.

Thanks, KC.

**Re: Re: Re: How to detect the NN optimal model**

Date :10/28/2000 2:07:35 PM Poster : Bruno VOISIN

Hello, I referred to Prof. Murtagh when I rewrote his A-Trous wavelet utility. I am not an expert in wavelets per se, but his following articles indirectly mentioned Morlet wavelet as not suitable.

Please contact him for details. His site is on [www.multiresolution.com](http://www.multiresolution.com)

If you want to try the A-Trous wavelet and his subsequent modified Haar, you can download the free Excel add-on on [www.foretrade.com/wavelet.htm](http://www.foretrade.com/wavelet.htm) You may even want to compare his code with mine. They are functionally identical (except for the EMA which I have not coded).

Regards Bruno

**Re: How to detect the NN optimal model**

Date :10/11/2000 Poster : Steve Ward

Nice piece of work, Peter. Very well thought out.

**systems getting better!??**

Date :10/11/2000 Poster : chris wong

this week i dug out some systems i built last year. they weren't very good last year but now they look pretty good to me. anybody got any ideas why that could be?

**Re: systems getting better!??**

Date :10/11/2000 Poster : RJ Young

I have no idea how to answer your question, but now I wish I hadn't abandoned the charts I made last year that didn't work!

**Re: systems getting better!??**

Date :10/12/2000 Poster : JM

It could be that current market conditions has changed and it favours your older systems which is actually more suited to this current condition. I know there are traders out there who use different systems for different market conditions. Heck, they even let their nets decide which system to use for current market conditions by predicting the most profitable system (using its equity curve) for current market conditions.

JM

## **Portfolio Optimization**

Date :10/14/2000 Poster : Steve Ward Mike's thought below deserves its own thread. I don't think it is blue-sky. In our October Newsletter we will mention the GeneHunter examples that do portfolio allocation and optimization. It seems like a very easy thing to define a variable (chromosome for GeneHunter users) that specifies what percentage of your assets should be in tech, another specifying the percentage in retail, etc. You optimize those variables based on the profit they would have made over the last N weeks (you select N), thereby giving you the portfolio mix that (hopefully) should be valid at least in the near future.

As an extension, you could use the NeuroShell Classifier to classify the current state of the market into one of several categories. Then in the GeneHunter optimization, instead of using the last N weeks, you use data from the most recent period when the market was also classified in the same category as today.

Anyone have thoughts to add? (I'm going to post this on the GeneHunter forum too in case any GeneHunter users want to comment.)

Mike wrote: I found a book entitled "Layered Learning in MultiAgent Systems - A Winning Approach to Robotic Soccer." Each agent (soccer robot) assumes different goals during the game (pass, carry, go for a goal) and the team optimizes alternatives to maximize goals. Now, think of the same thing applied towards investing. Each agent/computer (tech stocks, retailers...?) tries to change the investing mix to maximize the goal (or profit).

Perhaps its blue-sky, but its fun to contemplate.

**Security Device and Laptop Installation**

Date :10/16/2000 Poster : kc yeong I'm having difficulty installing NST in my laptop. My laptop does not have a db25 parallel port. It has USB ports instead. I've tried to use adapters (two to be more specific - (i) RS232 parallel to serial and (ii) USB to parallel). Although the second adapter connects successfully to my printer, I still get the message that the security device is not detected whenever I try to run NST. Any suggestions? Thanks.

Regards, KC

**Re: Security Device and Laptop Installation**

Date :10/18/2000 Poster : Bruno VOISIN

That's a tech support question. I believe WSG does provide USB dongle replacement for the Sentinel SuperPro original security block.

## PowerBasic Code for Maximum Entropy Analysis

Date :10/18/2000 Poster : kc yeong

I'm feeling happy today! For the simple reason that my little maximum entropy project is finally completed. Below is the source code. I've decided to rename the code from MESA to MEPS (for some obvious reasons :-( ).

I've found out that the original code that I've posted earlier is actually correct. But it needed some minor corrections so that it makes more sense. Comments are included to make it self-explanatory.

Regards, KC

```
----- Begin -----
'
' This program calculates the maximum entropy power spectrum (MEPS) for input_series[i].
' Two important parameters to choose carefully are the number of poles (poles)
' and the resolution of the power spectrum (fdt). They determine how the power
' spectrum will look like. The action of the code is as follows:
'
' 1) Preprocesses the data by detrending it to remove the long term (linear) trend.
' 2) Calculates the mean square deviation xms and coefficients d(i) using
' Burg's algorithm.
' 3. Calculates the maximum entropy power spectrum pow_spec.
'
' References: 1)Numerical Recipes in Fortran by Teukolsky, Flannery, et al. (A very
' technical and somewhat brief review but this is where the codes are
' found). Can download the whole book from the internet for FREE. Yipee!
' 2)Neural, Novel & Hybrid Algorithms for Time Series Predictions
' by Timothy Masters. (A practical approach -highly recommended for those
' with some math background).
' 3)MESA and Trading Market Cycles by John Ehlers. (For beginners).
' 4)Internet Search...
'
' I would also like to point out that References (1) and (2) present a more objective
' viewpoint to using MEPS and they do point out some of the subtleties (read difficulties)
' in using MEPS.
'
' There are 5 variables altogether - 4 input and 1 output. The calling procedure is
' EXTERNAL DLL CALL by ARRAY with the following declarations:
'
' #1 ---> ByRef Double as Time Series (for input_series). Default is Close.
' #2 ---> ByVal Integer as Numeric Value with Integer>0 (for poles). Default is 20.
' It usually ranges from 20 to 150. Low values are preferred. As a general guide,
' the ratio (poles/length) should be a small number. Higher values give more peaks
' in the power spectrum and lower values give a smoother spectrum.
' #3 ---> ByVal Double as Numeric Value with Real>0 (for fdt). Default is 0.2. It
' can take on values from 0 to 0.5. This is the one that is connected to the
' concept of Nyquist frequency in FFT. Allows you to zoom in the power spectrum
' for a more detailed look. Usually, a lower value is desired for finer resolution.
' #4 ---> ByRef Double as Indicator Output (for pow_spec). This is the power spectrum.
' #5 ---> ByVal Integer as Number of Value in Time Series (for length).
'
```

' For a start, you might like to plot three indicators with poles=20,50,100 while holding  
 ' fdt=0.2 as the constant. Then, superpose them together to see how increasing the number  
 ' of poles affects the spectrum. Then proceed to read and experiment, and read and experiment  
 ' more and read.....  
 '

#COMPILE DLL

SUB meps ALIAS "meps"

(input\_series AS DOUBLE PTR,

BYVAL poles AS INTEGER, \_

BYVAL fdt AS DOUBLE,

pow\_spec AS DOUBLE PTR, \_

BYVAL length AS INTEGER)

EXPORT

DIM i AS INTEGER, j AS

INTEGER, k AS INTEGER, m

AS INTEGER, n AS INTEGER

DIM xms AS DOUBLE, delta AS

DOUBLE, missing#, mean AS

DOUBLE DIM denom AS

DOUBLE, p AS DOUBLE,

pneum AS DOUBLE, sum AS

DOUBLE DIM wk1(length) AS

DOUBLE, wk2(length) AS

DOUBLE, wkm(length) AS

DOUBLE DIM sumi AS

DOUBLE, sumr AS DOUBLE,

d(poles) AS DOUBLE DIM theta

AS DOUBLE, wi AS DOUBLE,

wpi AS DOUBLE DIM wpr AS

DOUBLE, wr AS DOUBLE,

wtemp AS DOUBLE

missing=3.4e38

p=0

sum=0

n=length

m=poles

FOR j=1 TO n

sum=sum+@input\_series[j-1]

NEXT j

mean=sum/length

FOR j=1 TO n

@input\_series[j-1]=@input\_series[j-1]-mean 'detrends input\_series

p=p+@input\_series[j-1]\*@input\_series[j-1]

NEXT j

xms=p/n

wk1(0)=@input\_series[0] 'Burg's Algorithm

wk2(n-2)=@input\_series[n-1]

FOR j=2 TO n-1

wk1(j-1)=@input\_series[j-1]

wk2(j-2)=@input\_series[j-1]

NEXT j

FOR k=1 TO m



```

pneum=0
denom=0
FOR j=1 TO n-k
pneum=pneum+wk1(j-1)*wk2(j-1)
denom=denom+wk1(j-1)*wk1(j-1)+wk2(j-1)*wk2(j-1)
NEXT j
d(k-1)=2*pneum/denom
xms=xms*(1.0-d(k-1)*d(k-1))
FOR i=1 TO k-1
d(i-1)=wkm(i-1)-d(k-1)*wkm(k-i)
NEXT i
IF k=m THEN
GOTO 10
END IF
FOR i=1 TO k
wkm(i-1)=d(i-1)
NEXT i
FOR j=1 TO n-k-1
wk1(j-1)=wk1(j-1)-wkm(k-1)*wk2(j-1)
wk2(j-1)=wk2(j)-wkm(k-1)*wk1(j)
NEXT j
NEXT k
10 FOR i=1 TO n 'calculates power spectrum
delta=fdt/length 'angle interval
theta=6.28318530717959*delta
wpr=COS(theta*(i-1))
wpi=SIN(theta*(i-1))
wr=1
wi=0
sumr=1
sumi=0
IF i<m THEN
@pow_spec[i-1]=missing
ELSE
FOR k=1 TO m
wtemp=wr
wr=wr*wpr-wi*wpi
wi=wi*wpr+wtemp*wpi
sumr=sumr-d(k-1)*wr
sumi=sumi-d(k-1)*wi
NEXT k
'@pow_spec[i-1]=LOG10(xms/((sumr*wr)*(sumr*wr)+(sumi*wi)*(sumi*wi)))
@pow_spec[i-1]=LOG10(1/((sumr*wr)*(sumr*wr)+(sumi*wi)*(sumi*wi)))
'Since xms is a constant for a given m, log(xms) just rescales the axis
'so I've decided to ignore it. Will not affect the overall shape of the spectrum.
END IF
NEXT i
END SUB

```

----- End -----

**Stocks and Commodities Tips Source Code**

Date :10/19/2000 Poster : Ward.net Webmaster

Source code for many of the Stocks and Commodities Tips can be found in Trader Tips from Stocks and Commodities section of this site. There is a self extracting archive available for download with the source files. The majority of these have been coded with Visual C 6.0. It is assumed that you have some knowledge about programming and building DLL's as it is beyond the scope of our technical support department to assist you in this matter.

**Re: Stocks and Commodities Tips Source Code**

Date :10/23/2000 Poster : kc yeong

Thanks for posting the C source codes. They make great examples and understanding it is easier than I thought.

Regards, KC

## MEM Update

Date :10/21/2000 Poster : kc yeong

I've updated the maximum entropy method code. There are some changes, the main one is on how the power spectrum is displayed. I've also sent mem.dll and mem.tpl to WebMaster. **You can download a self-extracting archive file, mem.exe containing the DLL and TPL using this [link](#).** Below is the source code. Please read the comments even if you do not intend to compile it because there are some instructions on how to use the algorithm.

As I've said earlier, this project is experimental and its focus is really to show how the maximum entropy algorithm can be coded in PowerBasic. Understanding the algorithm for trading purposes is an even larger hurdle which I'm currently embarking on. I think that fundamental to its understanding is FFT. So, I'm digging up some old text to refresh my memory. Finding suitable learning materials that I can understand is also another hurdle.

I've tested the code by using a pure sine wave and it gave the desired peak. If anyone is interested, this is how I generated a pure sine wave using NST. All I've done was simply to pick my most hated stock (in metastock format), erased its data with Metastock Downloader and cut-and-paste the sine wave data generated from Excel. I'm currently trying to use the code to resolve a combined sine wave. This is where the real power of mesa lies, its ability to resolve nearly equal frequency components. For example, if the combined wave is  $3\sin(2\pi f_1 t) + 2\sin(2\pi f_2 t)$ , then the code should give two peaks that corresponds to frequencies  $f_1$  and  $f_2$ . Usually,  $f_1$  and  $f_2$  can be quite close to each other. While methods such as FFT and wavelets tend to give peaky spectrum and make the identification difficult, MEM's spectrum is relative smooth. If anyone has found other uses, do share.

```
' ' This program calculates the power spectrum of input_series[i] using the ' maximum entropy method (MEM). There are two parameters to adjust. The first ' is the number of poles (npoles). It determines how well the spectrum fits the input ' data. [Some technical details: MEM actually uses a fitting procedure like fitting ' a polynomial to a curve. The number of poles represents the number of coefficients ' of the polynomial used to fit the data.] If you choose a small number of poles ' (i.e. npoles=20), the resultant power spectrum will appear smooth with a few ' peaks. A higher number of poles (npoles=100) will give many peaks as the spectrum ' tries to fit into every corner of the data. The problem with using a large value of ' npoles is overfitting. It tries to find whatever peaks, whether it is there or not. ' The second parameter is the number of frequencies to display (nfreq). This actually ' is related to the resolution of the spectrum. Remember that the displayed graph is ' power spectrum (vertical axis) versus frequency (horizontal axis). The value of nfreq ' changes the frequency scale. If you want to get a closer look at a peak, use a ' larger value of nfreq to zoom in on the power spectrum. A special requirement is that ' nfreq be larger or equal to the number of input data points. If the condition is not ' met, nothing is displayed. ' ' The action of the code is as follows: ' ' 1) Preprocesses the data by detrending it to remove the long term (linear) trend. ' 2) Calculates the mean square deviation xms and coefficients d(i) using ' Burg's algorithm. ' 3) Calculates the power spectrum pow_spec and display it. ' ' References: 1) Numerical Recipes in Fortran by Teukolsky, Flannery, et al. (A very ' technical and somewhat brief review but this is where the codes are ' found). Can download the whole book from the internet for FREE. Yipee! ' 2) Neural, Novel & Hybrid Algorithms for Time Series Predictions ' by Timothy Masters. (A practical approach -highly recommended for those ' with some math background). ' 3) MESA and Trading Market Cycles by John Ehlers. (For beginners). ' 4) Internet Search... ' ' I would also like to point out that References (1) and (2) present a more objective ' viewpoint to using MEM and they do point out some of the subtleties (read difficulties) ' in using MEM.
```

```
' ' There are 5 variables altogether - 4 input and 1 output. The calling procedure is ' EXTERNAL DLL CALL by ARRAY with the following declarations: ' ' #1 ---> ByRef Double as Time Series (for input_series). Default is Close. ' #2 ---> ByVal Integer as Numeric Value with Integer>0 (for npoles). Default is 20. ' It usually ranges from 20 to 150. Low values are preferred. As a general guide, ' the ratio (poles/number of input data points) should be a small number. ' #3 ---> ByVal Integer as Numeric Value with Integer>0 (for nfreq). Default is 2000. ' This parameter changes the frequency scale (horizontal axes). If you use a ' larger nfreq, the power spectrum will be plotted on a finer frequency
```

scale. ' #4 ---> ByRef Double as Indicator Output (for pow\_spec). This is the power spectrum. ' #5 ---> ByVal Integer as Number of Value in Time Series (for length). ' #COMPILE DLL

```
SUB mem ALIAS "mem" (input_series AS DOUBLE PTR, BYVAL npoles AS INTEGER, _ BYVAL
nfreq AS INTEGER, pow_spec AS DOUBLE PTR, _ BYVAL length AS INTEGER) EXPORT
DIM i AS INTEGER, j AS INTEGER, k AS INTEGER, m AS INTEGER, n AS INTEGER DIM xms
AS DOUBLE, missing#, mean AS DOUBLE, sum AS DOUBLE DIM denom AS DOUBLE, p AS
DOUBLE, pneum AS DOUBLE, delta AS DOUBLE DIM wk1(length) AS DOUBLE, wk2(length) AS
DOUBLE, wkm(length) AS DOUBLE DIM sumi AS DOUBLE, sumr AS DOUBLE, d(npoles) AS
DOUBLE DIM theta AS DOUBLE, wi AS DOUBLE, wpi AS DOUBLE DIM wpr AS DOUBLE, wr AS
DOUBLE, wtemp AS DOUBLE
```

```
missing=3.4e38 p=0 sum=0 n=length m=npoles
```

```
FOR j=1 TO n sum=sum+@input_series[j-1] NEXT j mean=sum/length 'mean=0 FOR j=1 TO n
@input_series[j-1]=@input_series[j-1]-mean 'detrends input_series
p=p+@input_series[j-1]*@input_series[j-1] NEXT j xms=p/n wk1(0)=@input_series[0] 'Burg's
Algorithm to find xms and d(i) wk2(n-2)=@input_series[n-1] FOR j=2 TO n-1
wk1(j-1)=@input_series[j-1] wk2(j-2)=@input_series[j-1] NEXT j FOR k=1 TO m pneum=0
denom=0 FOR j=1 TO n-k pneum=pneum+wk1(j-1)*wk2(j-1)
denom=denom+wk1(j-1)*wk1(j-1)+wk2(j-1)*wk2(j-1) NEXT j d(k-1)=2*pneum/denom
xms=xms*(1.0-d(k-1)*d(k-1)) FOR i=1 TO k-1 d(i-1)=wkm(i-1)-d(k-1)*wkm(k-i) NEXT i IF k=m
THEN GOTO 10 END IF FOR i=1 TO k wkm(i-1)=d(i-1) NEXT i FOR j=1 TO n-k-1
wk1(j-1)=wk1(j-1)-wkm(k-1)*wk2(j-1) wk2(j-1)=wk2(j)-wkm(k-1)*wk1(j) NEXT j NEXT k 10 FOR
i=1 TO n 'calculates power spectrum and display it IF nfreq<n THEN @pow_spec[i-1]=missing
ELSE delta=(i-1)/nfreq 'condition is nfreq >= n theta=6.28318530717959*delta/2.0
wpr=COS(theta) wpi=SIN(theta) wr=1 wi=0 sumr=1 sumi=0 IF i<m THEN
@pow_spec[i-1]=missing ELSE FOR k=1 TO m wtemp=wr wr=wr*wpr-wi*wpi
wi=wi*wpr+wtemp*wpi sumr=sumr-d(k-1)*wr sumi=sumi-d(k-1)*wi NEXT k
'@pow_spec[i-1]=LOG10(1/(((sumr*wr)*(sumr*wr)+(sumi*wi)*(sumi*wi)))
@pow_spec[i-1]=SQR(xms/(((sumr*wr)*(sumr*wr)+(sumi*wi)*(sumi*wi)))
'@pow_spec[i-1]=xms/(((sumr*wr)*(sumr*wr)+(sumi*wi)*(sumi*wi)) END IF END IF NEXT i END
SUB
```

## **MEM and other market tools**

Date :10/23/2000

Be warned: This is a long article :=) This article summarizes my current thought on what are the relevant tools to use to analyze the market. If you have a different opinion, please share.

I've been learning classical Technical Analysis for a while now and I still do not get it. How I envy when I read or hear people say that they managed to develop profitable systems after six months into studying TA.

After reading some articles on applying signal processing (the main subject of Electrical Engineering) to market analysis, I'm beginning to see the significance of how and why all those types of averages and indicators are used in analysing the market. And I find it fascinating because it presents to me another dimension to understanding TA. My interest in maximum entropy method arises from this study.

So, how should MEM be used? And also FFT and wavelet? The way I understand it, I think they are most useful if they act as data pre-processors for neural networks. Took me some time to realize and arrive at this conclusion. In order to understand why, we need to understand the function of these algorithms. All of these algorithms have a common function, that is, to process (or transform) a time-series so that we can see it in terms of frequency components. In other words, instead of seeing a given data series as some number at a certain time, we get to see it in terms of some number at a certain frequency. The number in time is different from the number in frequency. The former

represents price (close) or price range (high minus low). If there is a large price range at time  $t_1$ , that reflects a significant period of volatility. The latter number represents a different type of information. It shows the magnitude (or importance) of a frequency component. For instance, if there is a large peak in the MEM spectrum, we can interpret it this way. The height of the peak represents power, which is the number for the frequency series I mentioned earlier. A high peak at a frequency  $f_1$  means that this frequency is significant and may be important compared to those frequencies with lower peaks. How high is high? A high means that there are other short ones. Hence, high is relative. It has to be interpreted within the spectrum and compared to the other components in the spectrum. So, does power represent anything useful? Like price is to time? Unfortunately, no (as I understand it). Its interpretation is mainly to identify which frequency is important. Other than that, as far as I understand it, it has no meaning. So, this leads to my claim that such techniques are data-preprocessors. We use these techniques so that we can 'see' the time-series from another viewpoint, in terms of frequencies. Assuming that there are hidden information in the frequency-series, we can let neural network sort out which are important and which are not. Of course, when I say MEM, it means the simple MEM code that I've written. Other commercial products may extend the usability of the algorithm so that it can do other things. I have not used such softwares. Perhaps those who have used it may like to say something about other aspects of its application?

So, experts say we can use these methods to profit from the market. But why? What is really the rationale for their claims. I will explore this further below.

The main assumption of this sort of analysis is that markets move in cycles. So, we can say that if you believe in this assumption, you believe in a Wave Theory of the market. I have rephrased the statement above for an important reason. The key word is Wave Theory. It supposes that market moves are similar to water waves found in the ocean, sound waves we hear ever so often, or light waves that allow us to see through our eyes. All of these have something in common, some regularities in their movements. This thought came to me recently and struck me like lightning. So, allow me to elaborate.

Let's explore what are not waves. Let's say that the market is really random (so hurray to Random Walk supporters). Random means no patterns exist. So, it means that the market is not periodic. And using any methods having to do with periods or cycles is doomed for failure. So, random signals are not periodic.

What if the market is periodic? This is really an assumption because I do think if anyone really knows. There are some diagnostic tools that can be used which I'll elaborate later. So, for the time being, let's assume that the market is periodic. More precisely, it is mildly periodic, with a lot of noise. Further, let's assume that the waves are linear (there are also waves that are nonlinear such as solitons, if I'm not wrong, which will make things rather difficult). The linear property basically means that two or more waves can be added or subtracted from each other. This important property therefore allows us to decompose the waves into its frequency parts by simple arithmetic (instead of some nasty nonlinear partial differential equations). Then, we can say that the market moves are really (signal + random). The main interest is the signal part which is periodic. To get a better signal, we need to eliminate the noise by using technical indicators such as moving averages or digital filters like Butterworth filters.

So, what can be responsible for the signal part of the time series? Since market participants are you and I, we are the ones that cause periodicity. Each of us has some internal clock. It may be due to social conditioning or just human nature (I'll leave this part is a bit vague because of my limited knowledge in this aspect). If there are only ten market participants in this world and we monitor their trading patterns for some time, we may most likely be able to predict their trading habits and patterns. With millions of participants, each with different investment horizon – short, medium, or long term, market moves appear chaotic. And within the chaos, if we're lucky, we can find some periodicity.

To end it all, I would like to say something about the diagnostic tools I mentioned earlier. These are tools of chaos theory. In it are magic words like dimension embedding, Lyapunov exponents and Talken's Theorem. Although still at its infancy and not to mention, extremely difficult, there are ways where we can use to assess whether a time series is random or chaotic. If random, no hope. If chaotic, there's hope. Sometimes, we say deterministic chaos, meaning that there are certain

quantities that actually remain constant within the chaos. Sounds like periodicity, don't you think? But then again, it is constant in phase space, not frequency.

### **What issue to pick?**

Date :10/26/2000 Poster : Steve Ward

Here's a way almost EVERYONE out there can contribute to this forum and help everyone else.

I've noticed for years that some issues (stocks, futures, indexes, whatever) are more "predictable" at times than others. Later, they usually become unpredictable, probably based on news or other external factors difficult to capture in inputs. When they are "predictable", many different types of indicators and strategies work well. At such times, you don't need to be a rocket scientist to build good models for those issues. Many of you are concentrating on finding the perfect "killer" indicators. Maybe you should be looking for the "killer" issues?

I have often found that the candidates for these good issues are those that I'll call "cyclic": i.e., they go up and down frequently either during the day or over a few days or weeks. Today's markets should be full of them.

So here's the request. Tell us what issues you are currently finding predictable. If you haven't built a good model yet, at least contribute by telling the rest of us what issues you have found that appear to be "cyclic" recently, and preferably not being driven by strong news related to that issue. Those become candidates for our models. Furthermore, tell whether this cyclic motion appears in daily bars or hourly and smaller in intraday charts. Post on this thread.

There are so many issues out there to search that everyone can be a positive contributor, even if you just got the Trader and haven't even learned it yet. How about it?

I'll start off: I have been concentrating lately on Boise Cascade (BCC), both daily and half-hour bars. I have made money in the past with this stock using nets, and another reason it may be good now is that the price is low enough that you can purchase a big block without going to options. But I know there are better candidates out there than BCC. What do YOU like?

### **Re: What issue to pick? -Any help from Hurst??**

Date :10/26/2000 Poster : Jacobs

When selecting an issue, do you have any help of calculating the Hurst exponent (or Hurst Significance)? [ Advanced Indicator Set 1 - Add on ] What figures have you found for BCC?

### **Re: Re: What issue to pick? Any help from Hurst??**

Date :10/27/2000 Poster : Steve Ward I hadn't thought of that, but Hurst is an excellent idea, especially when there is no obvious news related to the issue. I get about 30% to 60% annualized return when BCC is predictable.

### **Re: Re: What issue to pick? Any help from Hurst??**

Date :10/31/2000 7:22:52 PM Poster : Jacobs Thank's for your reply.

Sorry, but I was thinking of Hurst. Have you calculated any \_Hurst values\_ for BCC?

**Re: Re: What issue to pick? Any help from Hurst??**

Date :11/1/2000 3:39:44 PM Poster : Steve Ward Previously I hadn't tried Hurst, but here's a chart I made where I tried it. This indicator is supposed to indicate randomness between -1 and 1. Below -1 it is anti-persistent, meaning it reverses direction a lot, sort of anti-trending. The signals are out of sample, and the green line is an adaptive moving average made with our Adaptive Net Indicators addon.



**Re: What issue to pick?**

Date :10/27/2000 Poster : Victor Chu Hello Mr Ward, You have made an interesting point. I have found that my models work very well at times, but at other times they just flater. So do you have any indicators or ideas that will tell us when the market is "predicable" or not so that when it is "predicable" we will trade accordingly and when it is not then we will just ignore the signals?

Regards  
-Victor Chu

**Re: Re: What issue to pick?**

Date :10/27/2000 Poster : Steve Ward The idea that Jacobs had on this thread, to use Hurst, sounds like it might be effective, unless the issue suddenly becomes unpredictable because of news. If a major brokerage changes their recommendation, or a bad earnings report comes out, it might not be easy to catch before hand.

**Re: What issue to pick?**

Date :10/29/2000 5:11:26 AM Poster : Ergo Mann Steve Thought at this point I would stop lurking and contribute. Firstly, I wanted to say congratulations on this discussion group. I believe it is a good and worthwhile tool, especially for yourselves at Ward, to see how people are using your product and what improvements might me made and of course for us, so that we may find new and useful ideas. This response is one of encouragement rather than specific technical information. I am amazed by the contents of what I have read here. So many of the contributors asking for specific indicators etc., I have used your product for two years now. For the first year I did not produce a worthwhile model. However, I kept a diary of my attempts and after one year decided that my approach was incorrect. Having changed my approach I have built models using both the genetic algorithms and neural networks that have added significantly to the timing of my trades. Your product has paid me back several times over the amount it cost, especially in the recent past. Prior to using NST I had built a mechanical trading system (MTS) which had been enhanced over a ten year period. This MTS allows me to gauge accurately the probability of a stock changing trend in the short term, NST had added to timing the turn. Although I purchased the Adaptive Net add-in around nine months ago I have not had the time to use it. I find the indicators that arrived with NST sufficient to form a basis for my work. I am therefore surprised at the effort people are going to to find more esoteric indicators, as if suggesting that the built in indicators are poor. As such I believe (and mean no offence) that there is an element of running before walking going on. One of your contributors remarked that other traders seem to take up technical analysis and find (almost immediately) a successful system, this



undoubtedly shows a level of discipline. Discipline, I find is the single most important element to trading. Discipline not to take profits early or let losses run. Sounds familiar, yes, but I do not believe any package is going to teach a human discipline. We are all tempted to override system signals at some point. I sympathize with you chaps in the US. I live in the UK and have found the FT-SE 100 index works with NST. Although my MST works with the Dow (DJIA), NASDAQ (Composite) and S&P 500, I have not been able to reproduce the same level of accuracy or consistency with the American markets. I do believe though that it is just a matter of time. Lastly, I think your product is very good. I would though like to see a higher level of user programmability. I believe it is too manual. I would like to cut and paste indicators and parameters and would also like a Visual Basic like language built in. Sorry I had to ask. Why? Because I could then program and walk away reviewing results instead of sitting in front my machine day and night, quite literally. Thanks again Ergo

**Re: Re: What issue to pick?**

Date :10/30/2000 4:10:33 AM Poster : kc yeong

After reading this thread, I get the feeling that "one of the contributors" must be me. Just a wild guess. Anyway, I'd like to take this opportunity to clarify. Some of my initiatives and remarks may have been misunderstood as undermining the usability of NST's built-in indicators. If such are the thoughts, do accept my apologies. I do find the range of indicators offered by NST very impressive and coupled with its dll capability makes the usability of NST limited only by imagination, a feature that I have been looking (hard) for two years and now, found. And some remarks made are more of a reflection of my current thoughts on general trading strategy development and issues that may not be in line with in this forum. Don't worry, it's gone.

My remark that classical technical analysis is difficult is just that, the keyword being classical. It is my belief that advanced methods such as NN and genetic algorithm offered by NST, which belongs to Advanced TA, does offer a lot of opportunities in exploring the market. In the process of focusing on larger issues at hand, I have left out the fact that the statement was actually referring to short-term trading in the range of 1-3 days.

I admit that I'm not using the full capability of NST, i.e., in the area of NN and genetic algorithm. It does not mean that I do not find them useful nor understand how to use them. I do intend to use them once I get some more ideas on how to use it in terms of my own understanding. And I believe that data preprocessing is an essential area of focus in using NN successfully. And that is why I'm interested in MEM.

On the issue of whether it takes rocket science to trade, I think it is a matter of personal preference. And, as far as I know, many software packages do not offer enough technical details for using advanced indicators such as wavelets and principal component analysis. These methods are definitely useful. But I do not like to treat them as black boxes. Hence, my present approach is really to program tools that I find useful and can understand completely. And in the mean time, wait for the

day when I can fully understand the pre-packaged tools. There are many references out there. So, I do not see how it has anything to do with running or walking. To me, it is about maximizing profit.

**Re: Re: What issue to pick?**

Date :10/31/2000 12:12:30 AM Poster : JM

Hi Ergo,

On 10/29/00 5:11:26 AM you wrote:

>I find the indicators that arrived with NST sufficient to form a basis for my work. I am therefore surprised >at the effort people are going to to find more esoteric indicators, as if suggesting that the built in indicators are poor. >As such I believe (and mean no offence) that there is an element of running before walking going on.

Disagree. Different people have different market belief system. And different people have different backgrounds and training, not to mention different real life experience. An engineer will tend to use those tools that appeals to his engineering background, while a physicist tends to use tools akin to rocket science. People like KC are clearly an engineering species, and of course will be attracted to tools like FFT and MEM which makes sense to his engineering mind. And people like Vic, who are more inclined towards physics will look at the market thru the eyes of his wonderful Wavelets. However, for mere mortals like me, I am still looking at the market the same way people have been looking at it 10-20 years ago, ie, thru conventional tools that I can understand, like Stochastics, Mov Avg, RSI etc. This is not to say that these tools are no good, but just that I can understand them, therefore, I am comfortable in using them. However, this will not stop me from taking a peep at the market using other's people's periscope, like KC's MEM or Vic's Wavelets. After all, isn't trading about making money, profits, bottom line? And as long as the tools hold promise to greater future wealth, why not? So I don't believe that these gentlemen here are looking out only for esoteric indicators, but rather, what their belief system tells them to, and what their training makes them comfortable with. Do not forget, alot of traders among my peer, and possibly among yours too, disregard neural nets as simply curve-fitting tools that are useless in realtime trading. I am a software engineer and system trader by training and therefore knows what neural nets can do. To my peers, they are simply esoteric tools, but to me, they gave me the edge I need in trading. So whether it is running or walking, I think it is relative. What is considered "running" to you may be "walking" to others and vice versa.

>I sympathize with you chaps in the US. I live in the UK and have found the FT-SE 100 index works with NST.

No sympathy needed. I believe NST can work with all stock indexes, be it the FTSE, SP, DOW, STI or NASDAQ. It is just a matter of building the correct model and I believe with due diligence, you or I can succeed with NST. Not to forget, our American friends can still trade the FTSE futures or the FTSE stocks if they so wishes, and the FTSE is not the cash cow reserved solely for the Brits. I reside in Singapore but I trade the US bonds and e-mini SP. Who knows, someday, I might just try the FTSE too, hopefully, with some hints and tips from you :)

>Lastly, I think your product is very good. I would though like to see a higher level of user programmability. I believe >it is too manual. I would like to cut and paste

indicators and parameters and would also like a Visual Basic like language >built in. Sorry I had to ask. Why? Because I could then program and walk away reviewing results instead of sitting in front >my machine day and night, quite literally.

Yes, I believe NST is a damn solid product and it is getting better. I don't know why there are so many financial websites out there purporting to have built accurate and extremely profitable NN models using another product when there is NST with its many add-ons and even a DayTrader version that the other product doesn't even come close with respect to NST capabilities. My partner and I concluded that there can only be one reason. Those NST traders are so successful with their models that they do not have the time to sell their signals, nor do they need to. As for a VB language, why not? But will this distract Ward System's people from their main job of producing good NN packages? I foresee there will be an increase in technical support regarding programming, system writing, supposed language bugs etc. Furthermore, Ward's programmers will be hard-pressed to solve programming language problems, add newer features to the language, improve compiler/interpreter performance etc, unless of course, Ward Systems want to become another language vendor :) I have a better suggestion, why not "open up" NST by giving us a set of API or COM-enable NST, so that we can manipulate NST using our own favorite language like Delphi or VB or C++. In that way, this will save Ward alot of work as the responsibility of programming and trading system development now lies squarely on the shoulders of the users, and at the same time, this will give advance users more flexibility and power to work outside of the NST environment, leaving Ward System the much needed time to improve on the core NN engine and more fantastic (read, profitable) add-ons :)

regards JM

ps: Thanks to Vic for the wavelets DLL. Will definitely 'play' with it.

**Re: What issue to pick?**

Date :11/5/2000 4:19:46 PM Poster : Steve Ward

Ok, so who has a cyclic issue we can examine?

**Re: What issue to pick?**

Date :11/14/2000 2:56:34 PM Poster : Greg

I'm just a beginner to the trader, but it looks like I might have some luck with LEH, currently looking like 75% ROI.

**Re: What issue to pick?**

Date :11/15/2000 10:19:06 AM Poster : Tom Gamon

I have had a lot of success modeling and trading XOM. The Neural Indicators Recurrent Nets 5 have worked well when I use it as the input to a conventional network. Then I would optimize the parameters. Generally I would use a 5 year training range and evaluate the out of sample performance over three years. The criteria I use for evaluating is how well it outperforms against a buy and hold strategy. It should generally be at least twice as good with an equal amount of succesfull long and short trades.

I have made some good models on XOM using training data from 1985 to 1990 and reviewed its out of sample performance to date. They seem to hold up well.

If anyone has some other issues that seem to model well I would like to hear about them.

Also, as I am always in the market with XOM I maintain a short position in my account at all times. If I get a long signal I will double up the longs in my account. This allows me to reverse by (closing longs) and leaving untouched the shorts in the account. By maintaining the shorts in this manner you can eliminate the worry of trying to get a short order filled in a down market (uptick rule).

**Re: What issue to pick?**

Date :12/8/2000 5:41:52 PM Poster : vince Hello Tom can you please explain again how you are able to get around the Uptick Rule problem for short selling? Thanks On 11/15/00 10:19:06 AM Tom Gamon wrote: I have had a lot of success modeling and trading XOM. The Neural Indicators Recurrent Nets 5 have worked well when I use it as the input to a conventional network. Then I would optimize the parameters. Generally I would use a 5 year training range and evaluate the out of sample performance over three years. The criteria I use for evaluating is how well it outperforms against a buy and hold strategy. It should generally be at least twice as good with an equal amount of successful long and short trades. I have made some good models on XOM using training data from 1985 to 1990 and reviewed its out of sample performance to date. They seem to hold up well. If anyone has some other issues that seem to model well I would like to hear about them. Also, as I am always in the market with XOM I maintain a short position in my account at all times. If I get a long signal I will double up the longs in my account. This allows me to reverse by (closing longs) and leaving untouched the shorts in the account. By maintaining the shorts in this manner you can eliminate the worry of trying to get a short order filled in a down market (uptick rule).

**Re: What issue to pick?**

Date :11/16/2000 11:18:00 AM Poster : Steve Ward Ok, we're starting to roll now; we've got LEH and XOM. Let's hear from more of you! Caution 1: If you load LEH from Quote.com, watch out for Sept 25th, 2000. Some of the Quote.com servers are giving what looks like bad data for that day. Remember you can fix it in the Trader by right clicking on the close and selecting "Modify selected data file". Caution 2: If you don't have the DayTrader, you can merge daily XOM data with daily with XON data if you're careful. Export a text file from Trader for XON and rename it XOM, but first delete the last day traded if the Trader put asterisks in any of the fields. Then map the directory where you place the text file. The Trader will put the two together successfully if you make sure those asterisked bars are removed. If you have the DayTrader, you'll be able to get so many recent intraday bars from XOM that merging with XON won't be necessary.

**Re: What issue to pick?**

Date :11/16/2000 3:39:01 PM Poster : Daniel P Lyons  
My observations of the stock market suggest that good companies rise faster and fall slower relative to other companies. I know that is an obvious statement, but to me, proper selection criteria will "cull" 99% of the poorer performers. Once this task is complete, then modelling becomes simpler as the remaining companies are usually more reliable and stable. From practical experience, much of this criteria has

been devised by Strategic Management Consulting firms, venture capitalists and so on. And, much of the critical ratios and data utilised often create "leading filters" and even better still is available in electronic form. To give an example of such companies, here are 6 that I followed since March 99. The results of these companies will speak for themselves:

EMLX SILI TQNT INFY AMCC QLGC

So in summary, I feel one should step back and think how you would evaluate a company from a purchase or takeover perspective and develop selection criteria accordingly. Personally, I use about 20 criteria as part of my selection process. From there, I believe modelling the various trading scenarios is a much simpler task...particularly given the power that NST offers.

Daniel

### **Merged XOM Data**

Date :11/17/2000 6:34:57 AM Poster : Tom Gamon You might also look at Yahoo Finance, they have merged the data for XON along with Mobil and adjusted for splits since 1970. It can be downloaded into any compatible format. On 11/16/00 11:18:00 AM Steve Ward wrote: Ok, we're starting to roll now; we've got LEH and XOM. Let's hear from more of you! Caution 1: If you load LEH from Quote.com, watch out for Sept 25th, 2000. Some of the Quote.com servers are giving what looks like bad data for that day. Remember you can fix it in the Trader by right clicking on the close and selecting "Modify selected data file". Caution 2: If you don't have the DayTrader, you can merge daily XOM data with daily with XON data if you're careful. Export a text file from Trader for XON and rename it XOM, but first delete the last day traded if the Trader put asterisks in any of the fields. Then map the directory where you place the text file. The Trader will put the two together successfully if you make sure those asterisked bars are removed. If you have the DayTrader, you'll be able to get so many recent intraday bars from XOM that merging with XON won't be necessary. On 10/26/00 Steve Ward wrote: Here's a way almost EVERYONE out there can contribute to this forum and help everyone else. I've noticed for years that some issues (stocks, futures, indexes, whatever) are more "predictable" at times than others. Later, they usually become unpredictable, probably based on news or other external factors difficult to capture in inputs. When they are "predictable", many different types of indicators and strategies work well. At such times, you don't need to be a rocket scientist to build good models for those issues. Many of you are concentrating on finding the perfect "killer" indicators. Maybe you should be looking for the "killer" issues? I have often found that the candidates for these good issues are those that I'll call "cyclic": i.e., they go up and down frequently either during the day or over a few days or weeks. Today's markets should be full of them. So here's the request. Tell us what issues you are currently finding predictable. If you haven't built a good model yet, at least contribute by telling the rest of us what issues you have found that appear to be "cyclic" recently, and preferably not being driven by strong news related to that issue. Those become candidates for our models. Furthermore, tell whether this cyclic motion appears in daily bars or hourly and smaller in intraday charts. Post on this thread. There are so many issues out there to search that everyone can be a positive contributor, even if you just got the Trader and haven't even learned it yet. How about it? I'll start off: I have been concentrating lately on

Boise Cascade (BCC), both daily and half-hour bars. I have made money in the past with this stock using nets, and another reason it may be good now is that the price is low enough that you can purchase a big block without going to options. But I know there are better candidates out there than BCC. What do YOU like?

**Re: What issue to pick?**

Date :11/20/2000 12:19:50 PM Poster : Randy Brown I used TC2000 to generate a potential list of stocks with the following characteristics: large cap, avg vol greater than 500k, 2 and 5 year price growth between -15 and 15%, price above \$12 and beta (compares volatility to S&P500) between .75 and 1.25. Most of the stocks returned by this scan are familiar names whose charts don't have extended trends either up or down. They are more up and down with slight upslopes or downslopes. I chose Delta Airlines (DAL) and put together a quickie prediction/trading strategy using daily data and was pleasantly surprised at the results. These tickers may exhibit the type of cyclicity using daily data that NSTrader works well on. Here's the list: BR, CB, CHV, DAL, GM, HI, HMA, OXY, PD, RAL, RD, TRW. It may be helpful to include an intermarket type of indicator input for the predictions. For example, if you choose OXY then you may also want to look at the Amex Oil Index and the S&P500. This gives the net a chance to put price movements into perspective, so to speak.

**Re: What issue to pick?**

Date :11/18/2000 3:42:21 PM Poster : SCJohn

I made a stab at this problem earlier this year (Ed: see below). Note: I have not implemented this idea. If one buys into the theory, then there are not a whole lot of stocks out there to model. At least using monthly data to perform the calculations. If you believe the theory has merit, then results could be calculated using weekly data as opposed to monthly. Stock Candidates For Neural Networks Can one find stocks that are cyclic in nature as opposed to trending. The best type of stock to model for neural nets are ones that do not trend. In other words, one wants to model a stock that is cyclic. Is there a metric that would be of help in identifying stocks that have a tendency to be cyclic as opposed to trending? I believe that I have come across such a metric. That metric is the Z Runs Score and it's associated Z Runs Confidence factor. What is a Z Run Score? A Z Run Score identifies, for a given holding period, the types of winning and losing streaks. For example, using a holding period of a month, stock XYZ could have: Win/Loss/Win/Loss. Or the stock could show: Win/Win/Loss/Loss. Now the important thing to find out is if the stock sequences of wins/losses are just random events or are they significant from a statistical point of view. This is where the Z Runs Confidence factor comes into play. The Z Runs Score can be positive or negative. A positive number indicates that winning holding periods are followed by losing holding periods. A negative number indicates the winning holding periods are followed by more winning periods and losing holding periods are followed by more losing periods. Regardless of the sign of the Z Runs Score, the Z Runs Confidence factor tells us if we can have any confidence in what the Z Runs Score is telling us. For one to arrive at a valid conclusion the Z Runs Confidence factor should be 95% or higher. Z Runs Confidence factors in the range of 90% to 94% suggests that one is viewing an anomaly (for neural network modeling I would not exclude those stocks that fall into the 90% to 94% range). And just plain forget any stock whose factor is less than 90%.

For more information on Z Runs Score and Z Runs Confidence read " Profiting From The Z-Score" by Mike DeAmicis-Roberts in the January 1998 issue of Technical Analysis of Stocks & Commodities. Note: the formula shown in the article is incorrect and the correct formula can be found in the March 1998 issue.

**Re: What issue to pick?**

Date :11/27/2000 3:58:38 AM Poster : philippe bousseau John, Could you give the right Z runs score formula ?

thanks pbousseau

**Re: What issue to pick?**

Date :11/30/2000 10:23:45 AM Poster : Steve Ward We found a copy of the article on our TA of Stocks and Commodities CD of previous articles. The formula was indeed wrong, but TASC faxed us a corrected article. The new formula is below. However, the formula is for making a statistical analysis of a trading system you are ALREADY using. So it appears to be more for determining the cyclic nature of your trading systems than for determining the cyclic nature of your stocks. As the article puts it, it compares "the number of streaks there are in a set of trades with the number of streaks that could be expected randomly".

If you are interested in this subject, we suggest getting not just the article but one of the books mentioned in the references of the articles before trying to use the formula:

1. Paulos, John Allen[1992]. "Beyond Numeracy", Vintage Books
2. Vince, Ralph[1990]. "Portfolio Management Formulas", John Wiley and Sons. So here's the formula:  $Z \text{ Runs Score} = (N*(R-0.5)-X)/\sqrt{(X*(X-N))/(N-1)}$  where N=total number of trades (the article says you need at least 30)

$X=2*\text{winning trades}*\text{losing trades}$  R=Number of runs (each time your trading system switches between a losing and a winning trade, it is 1 run)

Since NeuroShell Trader has indicators for winning trades and losing trades, you can probably build this as a Trader indicator. (See the category called Trading Strategy: System Information.) However, you'd probably need to build a small DLL to compute R, because we couldn't immediately figure out how to compute R easily in the Indicator Wizard. You could feed that DLL the Trader indicators for consecutive winning trades and consecutive losing trades, which are probably enough for the computation of R.

**Re: What issue to pick?**

Date :11/21/2000 6:34:44 AM Poster : philippe bousseau an interesting link to find correlated inputs for free : <http://www.market-topology.com/> .

**Re: What issue to pick?**

Date :1/14/2001 4:38:38 AM Poster : Werner In my opinion, issues are only predictable to some extent, if their changes in price are not random. Exactly this is claimed (since most statistical concepts need normal/near normal distribution of data) by the

academics, and they are right - sometimes. Technical analysis, it does not matter what kind, needs dependencies in price changes of the data. Academics say, since markets are efficient (this assumption is NOT always correct), such inefficiencies do not exist. - This is wrong - sometimes. The best way to find out whether an issue is exploitable with technical analysis (neural nets or simple mechanical models or whatever) is to use a concept called "Hurst Exponent" to measure the fractal dimension of the data. Sounds rather scientific, but is easy to handle. You just need someone how gives you access to an ad-on that calculates the Hurst-Exponent of you data. The Hurst exponents returns values between 0 and 1. Let's come to the interesting part now: Prices changes are not either random or dependent. They can also be in between of the two poles. You can determine a trigger level of dependence in the data, necessary for your system to be able to deal with the data. For the beginning you should just read about the Hurst exponent. Skip the formulas if you are not intersted in them and try to understand the basic concept. Then you do not need to search for the right issue. Hurst will tell you which is exploitable. Then you should start your individual technical analysis, not before. By the way: Since I am no a programmer I am looking for an Hurst exponent ad-on for NSTrd Pro. The fractal dimension indicator of one of the ad-on products does not calculate the hurst exponent. -If someone has a solution -please contact me [on the forum](#). Ah - excuse my bad English, I am German. Werner

**Re: What issue to pick?**

Date :1/16/2001 8:34:16 AM Poster : Ward.net Webmaster Whoops! Actually both Hurst Significance and Hurst Exponent are in our Advanced Indicator Set 1 add-on. That fact never made it to our web page description of that add-on. Sorry, we'll fix that.

**Re: What issue to pick?**

Date :1/22/2001 6:00:34 AM Poster : Rich Denning

I just spent the weekend trying to answer this question. My focus is for a short list of stocks that will be good for 3 to 10 day trades. I decided to screen for several different criteria using ATRs and average % change in the daily range together with alpha and beta calculations and the Gapo Index (in TASC 1/01). I took highest 10 from each of the separate calculations out of 2000 stocks and then tested them on a nn 5 day predicion of open. Here is the list I found to be the best: SEBL, BEAS, CHKP, IDPH, RATL, SANM, EMC, MRNX, RFMD, EMLX, NEWP, PWER, ELNT, MANU, SDLI, DIGL, ITWO, MEDX, QLGC, AMCC

My net is producing about 100% per year on two one year walk forward tests. But this is condiderable less than the average return during the training/optimizing period. I am not sure how to know whether I have over curve fitted the model. I am intested in learning more about the Hurst indicator as a way to find good trading stocks. Where is this indicator found? Rich

**Re: What issue to pick?**

Date :1/22/2001 9:42:40 AM Poster : Steve Ward Rich: Nice job! I was hoping this thread wouldn't die out. I'm looking forward to trying some of these, and I hope more of you will submit some more candidates. It is perfectly normal for the training/optimization period to do much better than the out-of-sample periods. There will always be fitting during optimization or net training, but since you also did pretty



well out of sample and your model carried on for the next two years, I wouldn't call it OVERfitting. By the way, for those who didn't see it, the description of how to build Gapo in NeuroShell is on p57 of that issue, and/or you can get an example on this site under the section "Traders Tips from Technical Analysis of Stocks and Commodities Magazine". Below are the references we used when making the Hurst indicators in our Advanced Indicator Set 1 Addon (see the Addons section of [www.neuroshell.com](http://www.neuroshell.com)). Also see my post on this thread on 11/01/00. Peters, Edgar E., "Chaos and Order in the Capital Markets", Second Edition, John Wiley & Sons, 1996. Peters, Edgar E., "Fractal Market Analysis", John Wiley & Sons, 1994.

**Re: What issue to pick?**

Date :1/23/2001 10:09:27 AM Poster : Rob Maiman Rich: I'm new at this and wondered how you sifted through 2000 stocks using the filters you mentioned. I'd like to do the same to the Canadian market. Rob

**Re: What issue to pick?**

Date :1/29/2001 3:13:43 PM Poster : Ergo Mann As a response to Steve's thread I decided to set myself the challenge of adapting my process to US stocks. I apologize of the long post and hope this helps others. Since the initial post I have downloaded from Yahoo Finance various US stock data. End of day data, as Tom has mentioned, is available including the Dow Jones Industrial back to 1929. As an aside I use the Dow from January 1929 test how I would need to adapt models over a (very) long period. Do note that the data includes Saturday trading dates, which affects models using weekly data sets. A charting package may handle Saturday data as included in the prior or latter week. The exercise has been of enormous benefit as it has led me to produce neural networks (Predictions) that consistently generates positive Correlation (r) and R-squared. Prior to the exercise I would generate these in a haphazard fashion. Now I am able to generate positive signals on virtually all securities to which I apply the system. I have regarded the attainment, on a consistent basis, of positive correlation and r-squared as the measure of my effectiveness and progress in utilizing NeuroShell Trader. The models all use five-year training periods and three-year evaluations plus two walk-forwards of one year and two optimal walk-forwards. When applied to Johnson & Johnson: JNJ the following neural network (Prediction) results were produced:

Input State Date: 1997/05/28:

Input End Date: 1999/05/27:

Output Start Date: 1997/05/29

Output End Date: 1999/05/28:

Number of Bars: 500

Average Error: 82.7:

Correlation (r): 0.171:

R-squared: 0.0204:

Mean Squared Error 70160

% Correct Sign: 53.8

Note: Correlation and R are better the closer to one they are. The Errors are something I am working on to reduce.

Applying the Prediction (Neural Network) to a Trading Strategy (Genetic Algorithm) over the period 2000/06/01 to 2001/01/26 produced the following:

Start Date: 2000/06/01:

End Date: 2001/01/26:

Beginning Price: 87.101:

Ending Price: 91.938

Change in Price: 4.836:

Percent Change in Price 5.6%:

Annual Percent Change in Price: 8.4%

Return on Trades: 20.7% (15.8%):

Annual Return on Trades: 31.5% (24.0%)

Return on Account: 21.3% (15.9%):

Annual Return on Trades: 32.3% (24.1%)

Net Profit: \$17.64 (\$1579.91):

Gross Profit: \$28.07 (\$2753.04):

Gross Loss: \$10.44 (\$1173.13)

Ratio Gross Profit/loss: 2.69 (2.53)

Percent Profitable Trades: 75.0%:

Number Trades: 8:

Number of Winning Trades: 6

Number of Losing Trades: 2

Notes:

(i) I deliberately remove all data from 1999/06/01 when training the neural network to ensure that the results when applied to the more recent dates are not corrupted. You can see that a gap in the data is evident, from 1999/06/01 to 2000/05/31, this gives confidence that the network has indeed 'learned' the signals correctly.

(ii) The figures in brackets represent the Trading Strategy using an initial \$10,000 with trading costs of \$30 on entry and \$30 on exit.

(iii) The network uses only the indicators that ship with NeuroShell Trader. Using the same system Merck produced an 89% (73% with commissions) return over the same period and CISCO 82% (71.6% with commissions) excluding commissions. I will now seek to exploit these models in the real world. Obviously, there is room for improvement, removal of the one-year data buffer and understanding how often models should be re-trained. I am comforted that although the sample is small the re-training looks as though it can be conducted over an extended period. I will report back. Lastly, I have begun applying the Adaptive Net Indicators and preliminary results have been quite outstanding, I will conduct similar experiments on the same data sets and report the results. Ergo

### **Re: What issue to pick?**

Date :1/31/2001 11:38:04 AM Poster : Texas Bubba Your results look pretty good even though I don't understand the math functions you mentioned. Could you explain more how you used all of the old data back to 1929? I'm still learning NeuroShell but from what I already know your walk forwards don't seem like they go back that far.

**Re: What issue to pick?**

Date :2/9/2001 1:06:18 PM Poster : Steve Ward

Real nice work! And thanks for sharing it.

**Re: What issue to pick?**

Date :4/18/2001 3:07:14 PM Poster : Ward.net Webmaster We are posting this message for a user who does not have an internet connection, but who nevertheless wanted to tell everyone what stocks he has traded with success: I run an insurance agency and trade part time (evenings). I started trading with the NeuroShell Trader Professional at the end of January 2001, and today (April 18th) I have doubled my money with 71 trades. The best returns have been coming with the Cluster Indicators, and the others have been done with Adaptive Net Indicators. I feed momentum indicators into these. I Trade CMVT, SANM, SPOT, BBY, and MCHP.  
Jenner Jones

### **HAAR Wavelet Source Code**

Date :11/3/2000 2:43:39 PM Poster : Ward.net Webmaster Mr. Chu has been kind enough to send us the source code for his HAAR Wavelet function, as well as some other functions that he has written. The file can be downloaded using this [link](#). All discussion relating to these indicators should be directed to Mr. Chu via the forum.

### **Re: HAAR Wavelet Source Code**

Date :11/5/2000 9:55:24 AM Poster : Daniel P Lyons Hi Victor, solved the riddle re: crash...it was related to the number of points being passed. Have you investigated the ATrous function at all? I would be interested in your views on this function. It would appear that it may smooth noisy data which could be used as an input to a net for attempting to predict trends. I look forward to your response, kind regards, Daniel P Lyons

### **Re: HAAR Wavelet Source Code**

Date :11/14/2000 12:03:58 AM Poster : Victor Chu Hi Daniel, I have not investigated the ATrous function as yet. I am not sure if it suffers from the end point distortion problem. If it does, then it is not suitable to be used as inputs to Neural Networks. From -Victor Chu

### **Re: HAAR Wavelet Source Code**

Date :11/15/2000 3:45:15 AM Poster : Daniel P Lyons  
Hi Victor,

thanks for the update.

I spoke to John Bonn (WaveFin) re: end point distortion who made these points for Gabor/Morlet filters. Basically, the WaveFin filters are lagged so they do not incorporate any future data. If a filter that is not lagged is used as an input then you will get end point distortion. This does not occur with WaveFin because of the lagging.

The downside to lagging the filters is the lag itself. To compensate for this they allow the user to "tune" the lag according to their application. When you fully lag the filters the outputs will be completely accurate. You can reduce the lag by reducing the accuracy. There is a balance between accuracy and lag that can be found and will be dependent on your application. Also, there are guidelines for setting parameters to reduce lag yet still retain accuracy. He felt many people focus on reducing lag in their inputs. The real measure is the performance of the overall system (inputs and neural net). Providing a net with accurate lagged inputs will usually result in better overall system performance.

I hope this is useful,

best regards,

Daniel

### **Re: HAAR Wavelet Source Code**

Date :11/16/2000 12:51:12 AM Poster : Bruno VOISIN I suggest you contact directly Prof. F. Murtagh:

Prof. F. Murtagh, School of Computer Science, The Queen's University of Belfast, Belfast BT7 1NN, Northern Ireland <http://www.cs.qub.ac.uk/~F.Murtagh>  
f.murtagh@qub.ac.uk Centre for Image and Vision Systems  
<http://www.qub.ac.uk/ivs>

Regards Bruno

**Re: HAAR Wavelet Source Code**

Date :11/6/2000 5:21:01 AM Poster : kc yeong  
Victor, Wow! Those codes are great. Thanks for your generosity.  
Regards, KC

**Re: HAAR Wavelet Source Code**

Date :1/3/2001 5:52:41 PM Poster : cantley  
Are the .tpls and .dlls also available for those of us without compilers?  
Thanks, Steve

**Re: HAAR Wavelet Source Code**

Date :1/4/2001 9:51:05 AM Poster : Ward.net Webmaster  
Steve,

Look for a post by Victor Chu with the subject "Re: Re: Re: Re: Re: How to detect the NN optimal model" dated around October 30. It has the details for the tpl and dll.  
Ward.net Webmaster

**Before entering the Market.**

Date :11/28/2000 5:49:29 PM Poster : Jacobs

When do you decide if a found model/strategy is worth trying on the Market?

What tests or statistics do you look for?

What makes you feel a model might be promising?

**Re: Before entering the Market.**

Date :11/29/2000 8:54:57 AM Poster : Steve Ward

This is a really key issue for most of us. My ideas on this are well known, and I'll repeat them again later if necessary. But first I hope many of you out there will respond to this so we can see some fresh opinions.

**Re: Before entering the Market.**

Date :11/30/2000 5:29:21 AM Poster : James

Some trade system figures that I've found important are net profit, number of trades, percentage winners, trade time span, and max drawdown. Statistically speaking, the total number of trades should exceed 30 or so for any period of time evaluated. This is to ensure that the system figures obtained is relevant in terms of statistical testing. Then, I would test the system on real-time for a few months to see whether the system conforms to the statistics obtained from evaluation period. I'd look for any deviations of real-time results and try to fine-tune the system.

This leads me to a question: In the process of developing systems, I've tried to create a prediction indicator that predicts %change in open 2 days ahead by using exactly the same input, i.e., %change in open 2 days ahead. Since this is obviously curve-fitting, the out-of-sample results should be bad. On the contrary, my out-of-sample results are fantastic. If this is so, how much should I trust out-of-sample results?

**Re: Before entering the Market.**

Date :12/1/2000 12:12:04 AM Poster : Victor Chu

Hi James,

How do you get the %change in open 2 days ahead in the first place?

Thanks -Victor Chu

**Re: Before entering the Market.**

Date :12/1/2000 9:55:29 AM Poster : James

I just used the indicator wizard. I "lead" the "% change" of open by two days. If you try it, you will find that the actual signal matches exactly with the out-of-sample signal for the case when the output you're trying to predict is also created from the indicator wizard. If I use the default, the match is not perfect.

I've tried it for the case when there are no neurons, i.e., the linear case. I would assume that in this case, the predictor resembles a linear regression fitting. But I could not figure why the out-of-sample results are so fantastic.

**Re: Before entering the Market.**

Date :12/1/2000 12:29:47 PM Poster : James

Here's a website that might be of interest:  
[www.cs.iupui.edu/~ateal/draft3b.html](http://www.cs.iupui.edu/~ateal/draft3b.html). It has useful tips on profit testing and related issues.

On 12/1/00 9:55:29 AM James wrote: I just used the indicator wizard. I "lead" the "% change" of open by two days. If you try it, you will find that the actual signal matches exactly with the out-of-sample signal for the case when the output you're trying to predict is also created from the indicator wizard. If I use the default, the match is not perfect.

I've tried it for the case when there are no neurons, i.e., the linear case. I would assume that in this case, the predictor resembles a linear regression fitting. But I could not figure why the out-of-sample results are so fantastic.

**Re: Before entering the Market.**

Date :12/3/2000 2:04:18 AM Poster : Bruno VOISIN

Hello,

I would calculate a t-stats and its probability (significance) on the distribution of trades, and also look at serial correlation (lag=1). These are, as far as I know, basic tests for statistical stability. You can also look at confidence intervals, etc... All these tools are available in Excel.

Thanks the Central Limit Theorem, a sample of 10 to 15 trades is usually good enough for those tests, but of course, more is better.

I usually only do it on in-sample data, but it is often advised to do it on out-of-sample data too. I believe it then becomes a bit of an overkill. In your case, I would do it though to check whether your results come from random chance.

Regards  
Bruno

**Re: Before entering the Market.**

Date :12/5/2000 5:09:39 AM Poster : James

Hello Bruno

Thanks for the tip. In NT on-line help, it is advised that input for prediction analysis should not include leading indicators. Only lagged inputs should be used. I do not know the reason why and I hope someone can answer.

Do you carry out real-time testing? There are two methods that I use. One is to train the historical data up to present and then update data daily without retraining to see how the system performs. The other is to use train the historical data for the past few years and then update the historical data to present to test the system. Each has its own merits but I find that the latter saves more time. Do you subscribe to any of the above?

Regards, James

**Re: Before entering the Market.**

Date :12/5/2000 9:33:22 AM Poster : Bruno

Hello James,

My english is sometimes 'approximate'. NN inputs should never look in the future. In

economics, one often talks of leading indicators, simply because they do carry some predictive value, so that's is the way I interpret the word 'leading'. On the other hand, a lagged value is a past value for an indicator which would not have such predictive characteristic.

Your other question is a matter for debate. My feeling is that if you have enough coherent data, i.e. reflecting a consistent market behaviour, you can use walk-forward testing. This is the way NSTrader should be normally used. If not you can then train up to present, but you have no real indication of generalization, and you will be tempted to retrain your net periodically. A lot of traders do that, even though it is not a sound practice in theory. Personally, I like using the Adaptive Nets up to present, and then looking at the statistical distribution of trades for clues about system stability. I would like to know what other users are doing.

Regards Bruno

**Re: Before entering the Market.**

Date :12/6/2000 6:24:46 PM Poster : Randy Brown

Hi James,

It seems to me that if you use %change in open 2 days ahead as an input to a net that is trying to solve for %change in open 2 days ahead...you are giving it the answer. So I would expect it to have "fantastic" out of sample results. See what I mean? It's like having a crystal ball to see into the future! Or taking an exam with a 'cheat sheet'.

If you look at the Input contributions I'm fairly certain that you'd find that the '%change in open 2 days ahead' input would have a value at or near 100%. So even with out of sample data you are still feeding it 'the answer'.

**Re: Before entering the Market.**

Date :12/7/2000 12:57:12 PM Poster : James

Hi Randy,

I follow your logic. That does explain the out of sample results. Thanks. I just tried it out for fun to see how a 'perfect prediction' would look like. Does that mean that following such reasoning, any 'leading indicator' used as inputs to NN will mean sneak peeking into the future? Do you use any leading inputs?

Regards, James

**Re: Before entering the Market.**

Date :12/7/2000 4:13:19 PM Poster : Randy Brown

I think the best way to think about the 'leading indicator' issue is to ask whether or not that data would be available after all the backtesting is finished and you are actually trading off the signals in your net. Obviously if you are using tomorrow's close as an input to a net that tries to predict tomorrow's close, you won't have that input available until after tomorrow's close - so it wouldn't be useable (because it wouldn't be available).

Also (you're probably aware of this but just in case...), a leading indicator (or coincident indicator or lagging indicator) as used by economists (like, for example, money supply or index of new housing permits, etc.) is not the same



as an indicator in the trader that has a 'lead' applied to it. Some people use economic leading indicators because of a belief that a correlation may exist between, say, a contraction in money supply and a future slowdown in economic activity.

No, I don't use leads as inputs for obvious reasons but I sometimes use the lead of a graph to shift it to the left on the chart because I like to look at the charts. Sometimes I can get ideas for new inputs or even trading strategies by employing the flexibility that the trader gives me to view graphs with leads and lags. In the old days (before the trader) you used to have to 'lead' whatever it was that you were trying to predict by the number of periods ahead that you wanted to predict it. Now the trader takes care of those types of mundane details.

I hope this helps...

Randy

**Re: Before entering the Market.**

Date :12/8/2000 12:57:56 PM Poster : James

Thanks for your input. BTW, how do you lead the graph? I mean, what is the parameter that represents the graph?

Since I am the originator of this question and got the answers, I feel obliged to summarize it. Comments on flaws in the reasoning (if any) is appreciated. As I now see it, leading an indicator in the context of neural networks means shifting the price series to the left. For example, if we have a price series (x1, x2, x3, x4, x5, x6, x7, x8, x9, x10), we may shift the series to the left to make it a leading input to train the network. Say, a lead of one period will shift the price series to the left by one step. In this case, we use input x2 to train the network to predict price x1, x3 to predict x2, and so on.

x1, x2, x3, x4, x5, x6, x7, x8, x9, x10 original price series  
x2, x3, x4, x5, x6, x7, x8, x9, x10, x11 price series lead by 1 period

The problem with using a leading input is that we require x11 to predict x10. And x11 is the future price that we do not know in advance.

Thanks for all your responses.

**Re: Before entering the Market.**

Date :12/9/2000 6:59:33 AM Poster : Randy Brown

Hi Jim,

By "graph" I meant anything you can put in a chart (existing data/calculations, indicator, other instrument data, predictions, trading strategies). To answer your question, the parameter that represents the graph is called the Time Series in the indicator wizard. It works the same way in both the lead indicator and the lag indicator except that the lead shifts the 'graph' left and the lag shifts it right.

Upon further reflection I realized that I rarely use the lead indicator anymore...unless I'm just playing around and trying to visualize 'what-if' scenarios.

**Re: Before entering the Market.**

Date :12/9/2000 2:01:16 PM Poster : James

Thanks, Randy.

**Re: Before entering the Market.**

Date :12/17/2000 7:41:57 AM Poster : Maxwell Craven

I have never heard your ideas Steve, please repeat them.

**Re: Before entering the Market.**

Date :12/18/2000 1:48:46 PM Poster : Steve Ward

Well, I believe in the sixth Commandment of Non-linear Modeling and Neural Nets (see Tips and Techniques on this site for all commandments):

6. Thou shalt not apply statistical measures and precision to financial modeling.

The reason is that I think the myriad of elusive and changing variables that drive the markets means that good market models often don't last long enough for statistics to be applicable. There are many who make money on models that do not meet scientific standards.

So here is my favorite procedure:

1. Use an out-of-sample (evaluation) period of 3 to 12 months.
2. Screen for profit exceeding buy and hold, which is not hard in today's US markets.
3. Then "eyeball" the out-of-sample buy/sell signals to see if generally the model gave buy signals near the valleys and sell signals near the peaks. Make sure the profit wasn't made on only one long trend, and that there weren't any bad drawdowns.
4. If the model passes the fuzzy eyeball test, go with it. Remember, you are looking for a great edge, not the Holy Grail.
5. Diversify your funds into several such models on different issues.
6. After a while, your models may deteriorate as market conditions change, so keep working on new models to replace them.

However, for those who feel more comfortable with more formal analysis, there have certainly been some good ideas on this forum, and not just in this thread.

**Re: Before entering the Market.**

Date :12/6/2000 2:16:48 PM Poster : Ergo Mann

I subtract six to nine months worth of historical information from the data file and build my network using the remainder.

The out-sample would be, say, the nine months prior to March 2000 in this example. If the out-of-sample looks successful I then re-introduce the 'saved' data in three monthly stages.

If this achieves positive results I will then trade the model using the 'panel' system.

This gives me the greatest confidence when/if the model trades successfully, that the next signal will be valid.

One last wrinkle is that I have a Mechanical Trading System based on a technical analysis package and I look for complimentary signals between NeuroShell Trader and the MTS.

This seems to work and is not as long winded as it might appear.  
Ergo

### **Input selection**

Date :12/7/2000 8:15:09 PM Poster : Zocker

I would like to start a little discussion about input selection.

1) What is your technique for building a net? Do you build the nets on a trial and error base, or according to the "picture" how the stocks graph looks, or any other technical or psychological aspects? 2) In which form do you use these inputs? The inputs can be in raw form, as change, or in normalized data. For example: a moving average is the raw form, a change over a period of time creates an oscillator, and the sinus from this created oscillator normalizes it in a certain range. 3) How do you classify good and bad inputs? I made the experience that when I delete the best inputs found in the optimization the results getting better and wise versa by deleting the worse inputs the nets getting worse after retraining. 4) Do you build only one network for one issue or do you build multiple networks from different inputs? In case of multiple networks do you treat the results separate or do you build in addition a "overall network" from the results off the previous ones?

Thanks a  
lot for your  
time. I  
wish you a  
great and  
successful  
day.  
Zocker

### **Re: Input selection**

Date :12/9/2000 1:40:26 PM Poster : James

I'll try to answer your questions in general. I usually select my inputs by trial-and-error as well as to source for ideas from books, magazines and journals. I do not need to understand the mechanics of the system in detail as the net may or may not work in the market I'm trading. But if I do hit a jackpot, then I'll narrow down my focus and trying to understand everything about it.

I do not know if this is helpful but I always thought of the net as an equation similar to the moving average formula. In the latter, a price series goes in and some numbers come out called the moving average. In the same way, the net is an equation that processes some inputs to produce an output. Thinking it this way helps me to relief some of my phobia about nets.

**NYSE Uptick Rule**

Date :12/8/2000 3:53:47 PM Poster : Vince Notardonato

As anyone had  
an idea on how  
to get around  
the NYSE  
uptick rule for  
Selling Short?  
Thanks

**Re: NYSE Uptick Rule**

Date :12/9/2000 5:48:22 AM Poster : Nicka

One traditional way is by 'boxing'. It requires two accounts you simultaneously buy long in one short in the other this can be done on any uptick. When you want to take a short position you simply close the long.

Cheers! Nick

**Re: NYSE Uptick Rule**

Date :12/9/2000 7:02:31 AM Poster : Randy Brown

You could try Spyderys for the Dow Jones Industrial Average (DIA), Nasdaq 100 (QQQ), S&P500 (SPY) and a Mid cap index (MDY), all of which are traded on the Amex and are exempt from the uptick rule on short sales. I think there are a lot of newer ones lately as well...check the amex website.

## **Normalisation**

Date :12/9/2000 6:13:04 AM Poster : Nick

Any tips for effective normalisation ? I feel that it may be as important as the model itself. I have tried simple differences and percentage changes. Do you normalise all inputs ? Inputs and Outputs? I guess the object is to detrend the data (leaving something like Steves ideal range bound issues) and add the trend back in right at the end. I have tried stochastics in the past with not that much success any thoughts welcome.

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**Bruno Voisin – t-stat & serial correlation**

Date :12/11/2000 8:23:31 AM Poster : Jacobs

I think it's an important issue, stability or the probability of a random event, and would like to know more about how you perform these tests. Is it possible for you to give a simple example showing the procedure?

**Re: Bruno Voisin – t-stat & serial correlation**

Date :12/12/2000 11:56:59 PM Poster : Bruno

Hi, I am a big Excel fan, and I do most of my tests there. Obviously, it is better to have a good knowledge of statistics, but one can get away with some basics.

In a nutshell, the idea is to take your distribution of trades as a population, on which you calculate the mean trade and the standard deviation. The "t-stat" is basically a technique to compare the characteristics of two distributions, this time the trades distribution with a distribution of no profitability. So, to make it short, you divide the sample mean by its standard deviation to get the t-stat. You then get the probability, i.e. significance using the TDIST Excel function with a number of "degrees of freedom" equal to the number of trades minus one. That number is in a way a probability of results occurring out of random chance, therefore, lower is better.

Another important test is the serial correlation of trades, which can plague any statistical test. It is again quite easy to do in Excel, and the result must obviously be as little as possible.

There is also the calculation of confidence intervals to check the probability of trades within a range around the mean (CRITBINOM function). It is a good test to gauge the impact of outliers.

All this (and more) can be done on in-sample and out-of-sample data. I usually do it on in-sample. I actually would appreciate the view of a qualified statistician on this.

Testing time series distribution is quite complex anyway. And there's only so much one can do to build stable systems. You can also try to apply similar techniques to see how close your in-sample and out-of-sample distributions are really.

I hope this helps a bit,

Bruno Voisin ForeTrade

**Ergo Mann – old approach**

Date :12/11/2000 8:25:45 AM Poster : Jacobs

It was interesting to read your post regarding your first year experience with NST. You kept a diary and changed your approach. It would be interesting to hear how this first approach was. Can you elaborate a bit on this? You also changed something, was it mostly on the input or output side or maybe some other side?

**Re: Ergo Mann – old approach**

Date :12/13/2000 3:52:48 AM Poster : James

I am also interested.

**Re: Ergo Mann – old approach**

Date :12/20/2000 7:57:02 AM Poster : Ergo Mann

I am impressed that you included my nom de plume in the subject heading else I really would not have spotted it.

I read this yesterday morning, 19 December and was a bit taken aback by your question.

I log onto the forum once a week just to get a feel of what is discussed.

The initial response from my October article was not positive so I thought I had better keep quiet. I do wish though that this forum were available when I first bought NeuroShell Trader as I may have reached this point sooner.

At the end of the first year I went back to the book that made me purchase NST from Ward, Neural Networks for Financial Forecasting - Edward Gately. This helped me enormously as Gately is very disciplined and I believe you need to adapt his actions to suit NST (the program he used in the book works slightly differently to NST providing actual levels the underlying security is will reach). Gately's book covers input selection, preparing and manipulating data, through to training and developing a forecast for the S&P.

In the past year another book The Predictors - Thomas A Bass has helped me as well, though unlike Gately this is a more general overview of the subject rather than specifics in generating a working network. This trend of generality is what I pursue here.

It would be easy for me to say do this or that and I am sure many here will vehemently disagree. I wish to avoid that. NST is a very complex program with numerous subtleties that lead to useful or poor models. I do not profess to know all of them, though some are strikingly obvious when pointed out.

(i) I am reluctant to give away my own system (ii) I firmly believe that with the aid of these two books you will form a strict method of interrogating NST leading to improved models.

Ergo

**Re: Ergo Mann – old approach**

Date :12/20/2000 9:16:15 AM Poster : Steve Ward

>The initial response from my October article was not positive so I thought I had



better keep quiet.

I'm glad you're back. I thought your Oct posting was excellent. Everyone has to remember that this business is an art, not a science, and therefore it is difficult to label any approach as "right" or "wrong". Some strategies will be profitable for some people on some issues at some times, and some will be profitable for other people on their issues at other times. Even the notion of "profitable" is subjective. I have watched some very successful traders get that way, and I assure you that no two are doing the same thing. This forum is getting better every day because more of you are sharing your ideas, all of which will probably appeal to someone sooner or later.

## Evaluate a model – me?

Date :12/11/2000 1:00:19 PM Poster : Jacobs

How do you do it, with some kind of confidence, in a near random market , not accepting/using a false model.

Assume we have an issue that have an equal chance of going up or down. Maybe the real chance is 50-51% of going up (as an average). One year has about 250 trading days. The probability that x predictions are correct is  $(0.5)^x (0.5)^{250-x}$  [binomial distribution] If we find that 135 days are correct(  $135/250 = 0.54 = 54\%$ ) we get a probability of  $0.092 = 9.2\%$  Thus we are running a 9% risk of classifying the random model as a useful predictive model.

Assume we are evaluating indicators producing buy and sell signals at an average rate of once a week. We have selected 100 different indicators and want to decide if any of them has predictive power – which we define as being correct more than 55%. Our testperiod is 10 years = 50\*10 signals from each. What's the probability a random indicator slips through? Using the same formula we get a probability of 1.12% But the probability that any of the hundred is passing the test is  $1-(1-0.0112)^{100}$  and that's 68%

I think it's important to have figures of this kind as a background.

Frankly - I don't know how to evaluate a model in NST. But I want at least three things (my first level list) from my model.

1.) Performance is better than Buy & Hold. - What two figures do you compare?! 2.) Low probability that the result is obtained by chance. - At least a figure reflecting this. 3.) High probability that the performance will repeat itself in the (near) future (assuming a steady-state market!? no reports/no recommendations/no new orders etc.....) . and a figure reflecting this probability.

Who wants to use a model that is worse than Buy&Hold?

#1 and #2 I guess will be found somewhere among the statistics in NST – but where?

When evaluating #1 (searching for a probability measure) you also have to include number of trades, number of successful trades, how the profit was made - many small successful trades or just one or a few jackpots. It should be possible to obtain a figure for this, assuming something .....maybe a gaussian distribution –or something like that? Bootstrap method??( not much experience of this myself but heard of it)

To evaluate #3 I think the result of these walk-forwards might be used. (or the length of the out of sample period, might be understand as the number (or ratio) of successful trades?) But how? Bootstrap again???

In the end ( I know) , it's me that decides what "low" and "high" means and also if the market will be in a "steady-state" and all the other assumptions. But I want some figure reflecting this. Is it possible to get this? A relative figure is enough. With a figure I'm able to choose among different models otherwise.....yes what?

What things do you want from your models? And how do you decide if these goals are met? Any view is appreciated!

## Re: Evaluate a model – me?

Date :12/11/2000 4:43:27 PM Poster : Cantley

One of the things that has always concerned me is the way it's so easy to operate in a manner such that your out of sample isn't really out of sample anymore.

You run ideas until you get an out of sample test that's adequate. Do you have a good model, or have you fiddled so much that you've found a good model for the out of sample period you're using?

Circles within circles within circles...

Steve

**Re: Evaluate a model – me?**

Date :12/13/2000 3:50:16 AM Poster : James

For #1, the figures can be obtained from the trading strategy statistics under beginning and end prices.

For the rest, I think all these tests that you suggested can be implemented into NT through it's dll capability. For example, programming the binomial distribution should be quite simple and you can use as inputs, indicators that are available from the indicator wizard under system positions.

For example, I've programmed a simple indicator that measures the system drawdown using the r-squared coefficient of linear regression (r-squared = 1 represents an ideal system with no drawdown) . Such information is not readily available in the indicator wizard. Another is an indicator that displays a histogram/distribution of any variable. The only thing I have not managed to do though is to scale the x-axis to display the value of the variable that I want. The x-axis always displays the dates of the price curve.

**Re: Evaluate a model – me?**

Date :12/13/2000 8:48:08 AM Poster : Ward.net Webmaster

Not sure exactly what you are doing, but there are two r-squared indicators in the Regression category that might be helpful. For building histograms, the Data Exchange Add-on might be useful since you can program any type of display with it that has access to Trader data streams.

**Re: Evaluate a model – me?**

Date :12/13/2000 10:47:36 AM Poster : James

My aim is to fit the whole time series. I believe the indicators that come with NT can also do this but not as readily as what I aim to do. In this case, I do not have to deal with the regression period.

**Re: Evaluate a model – me?**

Date :12/19/2000 3:24:30 PM Poster : Ward.net Webmaster

>1.) Performance is better than Buy & Hold. - What two figures do you compare?!

First modify the Trading Strategy and select either the "Optimal" period or the "Current" (backtest) period if you optimized. Then press the Detailed Analysis button and look at "Change in Price", "Percent Change in Price" and "Annual Percent Change in Price". Those are buy and hold. Compare them to the stats below called "Net Profit", "Return on Trades", or "Annual Return on Trades". Here is a picture of the statistics as they appear:



## **STOCK PICKS**

Date :12/14/2000 10:05:04 AM Poster : Vince

I am relatively new at using the Day Trader and I am still trying to decide how to make a stock selection. There are so many stocks on the NYSE, I believe 3900 and of course I cannot trade them all. Does anyone have any idea on how to narrow them down to a manageable number? Do I keep the same stock all the time and run an optimization maybe once a week or do I come up with a new list of stocks every night for the following day? In either case which ones are the best candidates? If someone can give some help I would really appreciate it.

Thanks

Vince

## **Re: STOCK PICKS**

Date :12/18/2000 2:31:32 AM Poster : SM

For picking stocks to day trade I rely mainly on the news and staying with one sector works well too.

Scan the typical sites Bloomberg, Quote.com, etc. before the market opens. Check out the conference calls for the prior and current day on Quote.com (under earnings calendar) these seem to add to intra-day volatility. Of course, if your model goes bearish make sure that stock is shortable.

For intra-day trading make sure the prices are well supported on both sides with the level II data. I like to see at least 150,000 shares traded within the first half hour. For day trading volatility and liquidity are very important. That narrows the field of "tradable" stocks down dramatically. The number of new stocks you look at will be a function of time you have to have to evaluate them.

Happy Trading

### **Automated trading**

Date :12/18/2000 2:43:08 AM Poster : SM I  
have been working on a trading server that  
will (via the DataX api) interface with the  
myTrack on-line brokerage SDK. Is anyone  
else working on something like this?

Are there any other brokerages that provide SDKs for doing automated transactions?

### **Re: Automated trading**

Date :12/18/2000 2:50:20 PM Poster : Michael Stigall TradeStation has an interface  
on their alerts which can place automated trades with 3-4 brokerages (I use ETrade,  
and its one of them). The interface itself is not smart enough to cancel an existing  
order, so you are required to manually kill any existing order first on the same lot, or  
write some EasyLanguage code to handle more complex situations.

### **Trading UK Markets or other non US/Canadian Markets**

Date :12/19/2000 8:22:25 AM Poster : John Hegarty I am new to Trader and am interested in trading UK equities. I would be interested in other's experiences of using Neuroshell Trader in this or other non US/Canadian markets. I don't believe that there is a multicurrency capability and I assume that using the numerical of a UK Sterling price will be fine and that I can convert date formats as required. In terms of UK data sources I have yet to select a vendor and I am considering Market Eye and ADVFN as cost effective sources of historic and daily data (downloaded over an internet ADSL). I have not properly considered Quote.com, but from a quick look at their UK site they appear considerably more expensive than both the domestic UK competition and in comparison to their US pricing. I'd welcome any views on suitability/experiences/implementation of these vendors or on alternatives. If any one has other UK customisation or market experience they can share then this would be most welcome. Thanks John

### **Re: Trading UK Markets or other non US/Canadian Markets**

Date :12/20/2000 8:15:02 AM Poster : Ergo Mann

John

I trade the UK markets and use NST to track the UK traded options stocks as well as the indices of the UK, US, Japan and Germany.

I do not get hung up on the '\$' signs in the package it really is not a big deal. Though the way the data is constructed for the trading packages I use does obviate some functionality. For example, the Royal Bank of Scotland's data will say 1494.5 for £14.9450; I feed 1494.5 into NST. The US data I receive will already have the data in the correct dollar and cents configuration, that is, \$30.625 for BCC etc.,

End-of-Day Data I use a text file of UK stock and indices with a down-load of end-of-day indices from a reliable source on the Internet. I have an Excel worksheet that appends the data to the bottom of the '. CSV' file. The help file in NST is extremely good at pointing out the various options including a fantastic selection of date options.

Intra-Day Data For £7 a month Sky Digital gives you access to Sky Text which gives you tick-by-tick data for the major indices, including FT-SE, NASDAQ, DOW, DAX etc., This is the most cost-effective method, though I agree Market-Eye and Prestel are good alternatives, though perhaps not as cheap.

Ergo \*\*\*\*

### **Re: Trading UK Markets or other non US/Canadian Markets**

Date :12/20/2000 3:59:24 PM Poster : Ward.net Webmaster

Try using a Point Value of .01, so a value of 1494.5 can be turned into \$14.945 in the trading reports. However it should be noted that point value applies across all chart pages, so care should be taken when using point value on charts with multiple chart pages.

### **Re: Trading UK Markets or other non US/Canadian Markets**

Date :12/28/2000 7:28:13 AM Poster : Floating Bear

Don't bother. The UK market is far less volatile than those in the US. There is a UK tax (stamp duty) of .5% payable on all purchases. Brokers costs are far higher

(lowest is about £10) Research material is less widely available.

**Re: Trading UK Markets or other non US/Canadian Markets**

Date :1/12/2001 7:46:18 PM Poster : Maciej

John,

I'm trading the French and UK markets and know that Quote.com is fine for my US trading but does not presently have any European markets. For these I use Dialdata for EOD. It's OK but there are quite a few problems of data quality.

If you find any European based data suppliers please let me know, the problem being the need to feed in seamlessly into NST.

Regards,

Maciej

**Re: Trading UK Markets or other non US/Canadian Markets**

Date :1/14/2001 3:39:10 PM Poster : Massimo Campi

You can use for EOD data on the French market [www.netbrokers.fr](http://www.netbrokers.fr), Swiss market [www.quoteline.ch](http://www.quoteline.ch), Italian [www.clubdiborsa.com](http://www.clubdiborsa.com).

Regards Massimo Campi

**Re: Trading UK Markets or other non US/Canadian Markets**

Date :2/10/2001 3:28:36 AM Poster : Dr Iraj Jafarian

Hi, I am also using trader for the UK market. I use Investorease to import data into Trader . It costs me nothing.

### e-mini

Date :12/30/2000 8:35:13 AM Poster : Maxwell Craven

I've seen mention of e-minis on this forum. Can someone please explain them? Can I access them on Quote.com?

### Re: e-mini

Date :12/31/2000 7:57:38 PM Poster : JM

Hi Maxwell,

E-minis are mini contracts of their bigger counterparts that are traded on the CME. Eg, there is the e-mini S&P, which is only 1/5 times of the 'big' S&P contract, ie, 1 full point of the S&P is \$250 but 1 full point of the e-mini S&P is only \$50. Another difference between the e-mini contracts and their big brother is the tick size and the medium used for trading them. For the full S&P, minimum tick size is 0.1 while the e-mini S&P is 0.25. During the regular trading hours, the full S&P is traded on the open-outcry pit of the CME, while the e-mini S&P is strictly an electronic creature. There are other e-mini contracts traded on the CME as well, most notably the e-mini Nasdaq and the e-mini currencies. You may wish to check out their specs in [www.cme.com](http://www.cme.com).

Something else I find about the e-mini contract is that alot of brokers actually offer lower comission if you trade the e-mini S&P, though not sure if they do the same for the other e-mini contracts. And of course, the margin for the e-mini contracts are much smaller. One more thing I experienced while trading the e-mini S&P is that it tends to swing more wildly than its big brother, maybe because of the lower point value and the bigger tick size. Hope this helps.

JM

### Re: e-mini

Date :1/1/2001 9:18:13 AM Poster : Maxwell Craven

Thanks, JM, that explanation and the CME web site helps me quite a bit. Your observation that the e-mini S&P swings more wildly than its big brother makes me wonder if it is the kind of candidate Steve Ward talked about in his post. Have you found that these swings lead to profitable trading systems?

### Re: e-mini

Date :1/2/2001 3:46:30 AM Poster : JM

Hi Maxwell,

When I wrote the e-mini S&P swings wildly, you can read that as 'erratic'. It is by no means easy to predict the S&P, but I find predicting the e-mini S&P a bit more difficult because of those wild swings. The big S&P, though by no means a tame creature, behaves somewhat more orderly when compared to his smaller brother. The big S&P do make wild swings too, and definitely offer anyone with a good model the opportunity to profit from it, provided you have the stomach to face this king of the beast. As for me, I only dare to take on the e-mini, and even then, it is with respect that I enter its electronic pit. I do not have much success building a good intraday model for the e-mini, but I am still trying. I find predicting and trading the US bonds less stressful. You might want to ask the other more experienced traders in this group (believe me, there are some really experienced and successful guys here) to give you some pointers in trading and predicting the S&P and the e-mini S&P. Good trading.



JM

**Re: e-mini and SPY**

Date :1/9/2001 11:15:04 AM Poster : Maxwell Craven

I hope this doesn't sound too dumb, but does anyone have any suggestions about making systems with S&P, vs e-mini, vs SPY?

**Re: e-mini and SPY**

Date :1/9/2001 7:44:18 PM Poster : Bill Szaroletta

Let me toss a thought into the discussion: switch-trading Rydex mutual funds.

Rydex ([www.rydexfunds.com](http://www.rydexfunds.com)) has a family of no-load, low-management-fee mutual funds that track the S&P500 Index in various multiples of the S&P 500 performance. While lacking the high leverage of trading the S&P directly, these (what they call) "dynamic funds" can be switched-traded twice per day. They include: Nova at 150%, Titan at 200%, Ursa at -100%, TEMPEST at -200% and, of course, a money fund.

We're currently backtesting several S&P500 trading systems, developed using NS Trader Professional, utilizing Rydex to switch-trade based on a panel of experts "opinion" on the direction of the S&P 500: Strong Buy Long Opinion ==> Titan Buy Long Opinion ==> Nova (...not 100% of S&P500, but trading Nova/Ursa ratios is too much hassle) No Opinion ==> MM Sell Short Opinion ==> Ursa Strong Sell Short Opinion ==> TEMPEST

2x to -2x leverage may be too weak for some traders relative to trading the index directly, but might be suitable for some IRA, 401K, etc accounts. You need \$25K to open a direct Rydex account. Might be worth a look.

Regards, Bill Szaroletta

**Re: e-mini and SPY**

Date :1/12/2001 2:30:27 AM Poster : JM

Hi Bill, Interesting. Though I don't really know about Rydex, but I find your post informative and interesting. Thanks for sharing a new trading vehicle that can be modeled by NST.

regards JM

**Re: e-mini**

Date :1/2/2001 9:27:49 AM Poster : chris wong

if you want to get the emini futures on quote.com, you have to tell neuroshell about the symbols, because they aren't there now. make a text file called "emini futures.lst" and save it into the servers folder of neuroshell. here is what i have in my file: ESH1, March 2001 ESM1, June 2001 ESU1, Sept 2001 ESZ1, Dec 2001 ESH2, March 2002 ESM2, June 2002 ESU2, Sept 2002 ESZ2, Dec 2002 right now i think only the march 2001 contract is active. i got those symbols off of cme.com

**Re: e-mini**

Date :1/9/2001 1:25:54 PM Poster : Tim McPherson

On 12/30/00 8:35:13 AM Maxwell Craven wrote: I've seen mention of e-minis on this

forum. Can someone please explain them? Can I access them on Quote.com?

E-Mini generally refers to the EMini S&P and E Mini Nasdaq Futures. They are smaller contracts and are traded only electronically.

On Quote.com the current contract symbols are ES01H (e mini s&p march) and NQ01H(emini Nasdaq march)

<http://www.cme.com> (Chicago Mercantile Exchange) has complete info.

Tim

### **Cluster add-on?**

Date :1/4/2001 7:07:45 PM Poster : Michael Stigall Has anyone else tried out the new Cluster indicators? I didn't have much result with using them as NN input, but received excellent improvement by using them as entry/exit points in a trading strategy. I'd be interested in hearing about other folk's experiences with the new tool. Thanks.

### **Re: Cluster add-on?**

Date :1/5/2001 8:00:21 PM Poster : Zocker

Hello Michael The same happened to me with the Cluster indicator. I used the Cluster indicator sample; changed the stock to CELG added a trailing stop and a crossover above/below indicator for exit signals. Trained the trading strategy on one year data "bought" as many shares as possible and have now a strategy which produced a more than 7000% gain. Since one week I try to check it out on paper trading. The results still jet do not look bad at all. After a half year playing with NST I believe it's easier finding stocks, which fits your indicators as indicators which fits your stocks.

Good luck Zocker

### **Re: Cluster add-on?**

Date :1/7/2001 10:02:18 AM Poster : Michael Stigall

I also saw numbers which showed 5,000% to 20,000% gains. I haven't tried anything beyond paper trades yet; I'm in the process of moving to a new brokerage.

I was also amazed at how often the clustered traded, even without exit signals.

I agree completely with you on the quality versus quantity. Its better to have a technical system you understand and then find out which stocks perform well with the system. And there are so many good systems already out there, which benefit from the "tweaking" possible with Neuroshell Trader Pro <grin>.

### **Re: Cluster add-on?**

Date :1/10/2001 3:02:04 AM Poster : Daniel P Lyons Hi Michael, I was most interested in your comments re:Cluster Indicators. Have you tried them on Nasdaq or S&P futures? Best wishes Daniel

### **Re: Cluster add-on?**

Date :1/10/2001 8:57:42 PM Poster : Michael Stigall I'm not "into" futures yet <grin>. I trade stock options on NASDAQ tech stocks only. NS Trader Pro is used to forecast stock price change, and then I use OptionStation to pick suitable options. On 1/10/01 3:02:04 AM Daniel P Lyons wrote: Hi Michael, I was most interested in your comments re:Cluster Indicators. Have you tried them on Nasdaq or S&P futures? Best wishes Daniel

**options**

Date :1/9/2001 11:29:43 AM Poster : chris wong has anyone got any ideas suggestions or tips on the best way to make options systems with nst? where do you get the data? is it better with daytrader than trader pro? what issues work best? any suggestions on inputs?

**indicators to import**

Date :1/10/2001 6:31:01 PM Poster : FRED SMILEK I programmed some of my indicators in Tradestation 2000i, and I exported them. Please advise on how I can import them into Neurshell Trader, I am having a bit of trouble finding the import facility. I read the help file and it indicates to do it through the chart creation.

Thanks

**Re: indicators to import**

Date :1/12/2001 2:51:34 PM Poster : chris wong wardsystems put a new doc on the changes in documentation section here called change in omega research proSuite 2000i interface documentation which it seems might be easier to understand and maybe have more details. take a look at that

### **daytrader pro questions**

Date :1/18/2001 1:39:20 PM Poster : Jimmy Raineri

1. If/when you are disconnected from the quote.com feed, you are presented with a message box asking if you want to reconnect or not. Is there any way to have it attempt to reconnect immediately, and then every xx seconds thereafter until told otherwise? The fact that it won't automatically reconnect pretty much negates any benefit of setting alerts - I'm listening for an alert from across the room or in another room and I have no idea that it isn't even connected. It also makes unattended operation impossible.
2. In the trading strategy parameters, there is the option to "buy as many shares as possible with current account balance". I don't think this is working properly -it uses the profit from a current day trade to make the next trade - that money is not in your account at that time and would result in a regT call. Is there any way to make it properly calculate the real "buying power" in an account at the start of day and trade for that day based on that only?

Thanks for any assistance.

### **Re: daytrader pro questions**

Date :1/18/2001 2:17:31 PM Poster : Ward.net Webmaster

Release 3.2 already has the feature you are requesting in #1. With regard to #2, this may depend on your broker. The daytraders here at Ward Systems use Datek, and they seem to make the credit available after every trade. The others here tend to use Ameritrade, which we think does not seem to make the money instantly available. We suspect that firms which cater more to daytraders are more like Datek than Ameritrade. Maybe we can hear from other users with other brokers on this issue?

### **Re: daytrader pro questions**

Date :1/18/2001 6:51:47 PM Poster : Jimmy Raineri That's pretty unusual to make a current day profit available for trading - but then again wasn't Datek the one who would let you short a stock no matter if it had the stock or not?.... Either way, since it is not the norm to make those funds available current day, is there a way, or could a change be made to make trades based only on the amount of money in the account at the start of the day? It is pretty hard to come up with an accurate trading when the system trades with money it doesn't really have. When will release 3.2 be available? Thanks.

### **Re: daytrader pro questions**

Date :1/23/2001 2:22:27 PM Poster : chris wong

i just received a brochure in the mail from ameritrade saying they now have real time account updates. account balances are now updated "immediately after your transactions occur". brochure says it makes it easier to place multiple trades during the same trading day.

### **What issue to pick - a useful procedure???**

Date :1/23/2001 8:11:54 PM Poster : Jacobs

First I will thank you all for your interesting postings and WSG that have started this forum. Special thanks to those who submitted code,dll's ,templates and book recommendations!

I have found it rather difficult to build a useful neural net model for a particular issue. Besides, Steve Ward has a couple of times written that we should select an issue that is easy to predict and if an issue is predictable many models(variables) will predict it.

These last days I have tried another version – I've started with a model searching for an issue. This search is done in different steps. Model: 5 inputs, 40 hidden nodes in training mode and default (10?) in genetic mode. Optimize on training set. Training time 3-5 years + 1 walkforward of 1 year 1.) Run the model for as many issues you can -in optimizing mode(parameter search) 2.) Throw away those issues that are nonprofitable (negativ return). 3.) Of the remaining issues throw away those that have a return that is less than buy&hold

Now you have issues that are profitable and the model is better than buy&hold.

Now change the evaluation period - use two walkforwards of 6 months, still using the same dates as before.

4.) Run/optimize the model again for the found issues. 5.) Throw away those that are nonprofitable 6.) Keep only those that are better than buy&hold 7.) Of the remaining issues keep those that show a profit and have a return that is better than buy&hold on BOTH walkforwards. (both walkforwards should now show a profit and the return is better than buy&hold)

I end up with profitable issues that show some degree of consistency, both walkforwards show a profit and the profit is better than buy&hold. Optimization is meant as a filter. If it can find parameters that show a profit in the past and the future(out-of-sample) it's a sign of repeating movements in those issues.

To refer to the beginning – repeat the procedure with a (quite) different model. See if some issues turn up again – in the end of the process or near the end... ( I have only done this with one model)

Well, this procedure seems rather mechanical. Are there any hidden problems that I have overlooked? How dangerous is the procedure – like using the result on the out-of-sample to correct/adapt your model? Where are the critical parts and how can I reduce them? Is this a way worth trying?

Any comments are appreciated.

### **Re: What issue to pick -a useful procedure???**

Date :1/25/2001 8:27:03 AM Poster : Texas Bubba

I have to apologize to everyone for lurking here so long without contributing but I am not a professional trader like you and the others. I only just started trading when I got Neuralshell a while back. I was amazed that your systems is so much like mine, except that I dont evaluate two different ways, but now I'm going to try it out your way. Ive been reading all the things Ward has put out and I can't see where we have anything wrong here and it has seemed to work good enough for this country lad to use. I have to warn you though that I'm only into stocks at this time but I got hooked

enough to know that I want to expand out later.

**Re: What issue to pick -a useful procedure???**

Date :1/25/2001 8:57:44 AM Poster : Maxwell Craven

Well, I'm certainly not a professional either, but I really like your idea. How many issues do you use and what type are they?

On 1/25/01 8:27:03 AM Texas Bubba wrote: I have to apologize to everyone for lurking here so long without contributing but I am not a professional trader like you and the others. I only just started trading when I got Neuralshell a while back. I was amazed that your systems is so much like mine, except that I dont evaluate two different ways, but now I'm going to try it out your way. Ive been reading all the things Ward has put out and I can't see where we have anything wrong here and it has seemed to work good enough for this country lad to use. I have to warn you though that I'm only into stocks at this time but I got hooked enough to know that I want to expand out later.

**Re: What issue to pick -a useful procedure???**

Date :1/29/2001 8:35:06 AM Poster : Steve Ward

Jacobs:

I too like your method. You keep the number of inputs and hiddens small. You seem to avoid the problem of fitting the evaluation set by running a model only once. The fact that you use many issues in that one run means you can find predictable ones without the evaluation fitting. You help assure that the predictability was no accident by running with a different evaluation set. You don't train too far back and you don't insist on a long evaluation set, which I like. To all of this I would suggest diversification in all of the models that result. Thanks for sharing this with us.

Steve Ward



**End of Day Data Sources besides HistoryBank**

Date :1/26/2001 2:23:30 PM Poster : snd

Does anyone have End of Day Data source they would recommend with Neuroshell Trader?

**Re: End of Day Data Sources besides HistoryBank**

Date :1/27/2001 10:39:49 AM Poster : JM

Hi,

I use Pinnacle Data for futures end-of-day data. Pinnacle's data seems clean and their data-maker software offer unadjusted, forward-adjusted, backward-adjusted and ratio-adjusted continuous futures price data, which is suitable for neural networks. Service is good and price is cheap. Daily update of database is done over the Internet using their downloader program. I strongly recommend this data provider. Their URL is [www.pinnacledata.com](http://www.pinnacledata.com).

I am not in any way connected to Pinnacle, but just a very satisfied customer, and just feel like sharing this info with everyone here.

JM

**Re: End of Day Data Sources besides HistoryBank**

Date :1/27/2001 1:47:58 PM Poster : Steve

I use CSI. They provide wonderful tools! For futures, I can construct most any kind of continuous contract that you can think of. They offer stocks as well. The price is pretty good too.

<http://www.csidata.com>

Best, Steve

**Re: End of Day Data Sources besides HistoryBank**

Date :1/28/2001 8:54:40 PM Poster : snd

Thanks.

On 1/27/01 1:47:58 PM Steve wrote: I use CSI. They provide wonderful tools! For futures, I can construct most any kind of continuous contract that you can think of. They offer stocks as well. The price is pretty good too.

<http://www.csidata.com>

Best, Steve

**Re: End of Day Data Sources besides HistoryBank**

Date :1/29/2001 10:39:22 AM Poster : tom Gamon

If you are modeling stocks, you might want to try Yahoo Finance - Historical Data , it is downloadable into csv format. The data is available for free and as much as thirty years is available for most stocks. I believe it is provided by CSI for Yahoo. However you must re-sort the data from earliest to latest to make it work with NS Trader, this can easily be done with Excel or similar.

Best regards

**Re: End of Day Data Sources besides HistoryBank**

Date :1/29/2001 2:03:31 PM Poster : snd

Thanks, I downloaded Yahoo this weekend and it looked pretty good. I had to resort the order and change the date format in Excel. Does anyone know of a more automated way? Like a downloader or Excel Macro? Right know I am debating signing up for CSI or writing a macro.

**Re: End of Day Data Sources besides HistoryBank**

Date :1/30/2001 2:18:42 AM Poster : Olli Myllynen

There is a free piece of software called QuoteMonster available at [www.xmlworks.com](http://www.xmlworks.com) . It is really a set of perl scripts, but it will do the trick.

I used it before I signed up for CSI to test my simple ideas - I would not dare to use any free data floating around for my trading or system creation. The risk is simply too big in futures trading.

Olli

**Results of Search: End of Day Data Sources besides HistoryBank**

Date :5/6/2001 5:44:22 PM Poster : Stephen

All, After using or reviewing Dial Data, HistoryBank, Telescan, Prophetlink and CSI the winner by far was CSI. My observations matched the conclusions of an article in Future's Magazine on End of Day Data sources. My personal experience with Dial Data and then later HistoryBank was a constant battle with bad data. Trading systems would look great until I looked back through the results and found the 500% winner made the system. Zero's would cause Tradestation to blow up while scanning charts. Prophetlink look good so I signed up for the trial and downloaded some select stocks. The 30 day trial only lasted a day, I found a zero in the volume data of SSTI. Yahoo uses CSI data and provides it for free, so I had thought of crafting my own downloader, but decided it wasn't worth the time. It has been I while since I used Telescan, but I don't remember being impressed. Thanks for your help. Hope this is of use. - Stephen

**Re: Results of Search: End of Day Data Sources besides HistoryBank**

Date :5/7/2001 8:37:20 AM Poster : Xprogrammer

Stephen:

Thanks for taking the time to tell us about your review. Take a look at Gary's thread called "Cheap Data". He tells where to get a \$30 downloader for the Yahoo data.

The Xprogrammer

**Re: End of Day Data Sources besides HistoryBank**

Date :1/30/2001 10:16:10 AM Poster : chris wong

maybe my excel is set up different, but i downloaded from yahoo and didn't have to change the date format. in fact when i select download spreadsheet it loads excel right into my browser if i select the open option in the browser instead of the save option. i then just selected the columns and used the sort command to reorder the rows. very easy since i didn't even have to load up

excel. then i just saved in the csv format into the folder that i use with neuroshell.

**Re: End of Day Data Sources besides HistoryBank**

Date :2/2/2001 2:11:09 PM Poster : Maxwell Craven

Prophet Finance has good and inexpensive data that can be downloaded using the Dial Data downloader that is already part of Neuroshell. You just change the internet web site it goes to, and their server mimics the Dial Data one. They can also deliver in Metastock format, which seems to work fine in Neuroshell. See [www.prophetfinance.com/marketdata/](http://www.prophetfinance.com/marketdata/)

**Re: End of Day Data Sources besides HistoryBank**

Date :8/10/2001 6:24:04 AM Poster : albertl

Hello, I am trying out Prophet at present and would like to give the Neuroshell inbuilt downloader a go at mimicking dial data, as you mentioned, can you may be help with the Prophet download server address? Also Prophet says they have cash contracts, but I do not get data for EC1599, JY1599 etc. Indices tickers seem not to be as numerous as with Quote.com , some strange values like negative ( ! ) or zero quotes have appeared exceptionally at least with continuous contracts at my side Thanks albertl

**Re: End of Day Data Sources besides HistoryBank**

Date :8/10/2001 1:52:04 PM Poster : Maxwell Craven

Hi Albert - I use Quote.com now, but I remember that Prophet provided an alternate URL to go into the Dial Data downloader. You have to tell them that you are using NeuroShell Trader, and that you want their product that uses the Dial Data Downloader. They give you URL that replaces Dial Data's URL. You go into the data sources menu and into the end of day download part. Then in Dial Data download setup, theres an internet setup button that has dial.tdc.com and dial2.tdc.com in it. I just replaced those with what Prophet gave me. I suggest that you email Prophet tech support with the other questions, because I don't remember much about their ticker symbols. If they don't help you, I guess you can try Dial data - I recall they weren't that much higher; maybe their symbols are more like quote.com. I think you're supposed to tell them that you are using NeuroShell also.

**Re: End of Day Data Sources besides HistoryBank**

Date :8/14/2001 4:27:25 PM Poster : albertl

Thanks Maxwell, I thought by now I would have got an answer from prophet, so I could pass on the URL. I am slightly put off now, as they just are increasing their prices. I believe also I would have to subscribe to the futures data in order to get currency data, this would be an overkill .Their index data seem not to include currency indices and I do not need futures for the moment.

So I am turning now to track data or may be to AIQ. I wonder if anybody is using AIQ ( the program and the data ) and profiting the data for the NS Trader? albert

**Re: End of Day Data Sources besides HistoryBank**

Date :8/15/2001 9:08:33 AM Poster : Steve Ward

Today I am emailing the CEO of Prophet Finance and asking that they find out

what happened with your answer. Let me know if they still don't answer. I have always thought they were more responsive than most data feed vendors. I am hoping your request just got lost somewhere.

Steve Ward

**Re: End of Day Data Sources besides HistoryBank**

Date :8/15/2001 11:24:10 AM Poster : albertl

Here already the answer from AIQ ( it took 2 emails from me before they reacted) " Dear Albert, Yes, you can download the historical data to Excel, DIF, PRN, and ASCII files. These are normal files, tab or comma delimited. Whether or not you can use the data in the Neuralshell program is something you'll need to take up with them. I hope this answers your question. ... Regards,..Sandy..." At 59\$ (basic-with unlimited historical and delayed data). Seems worth trying out, hope the exact fields / format will not give trouble in the end and that the indices and currencies will be there.

> ~~~~~

**Re: End of Day Data Sources besides HistoryBank**

Date :8/15/2001 3:13:56 PM Poster : webmaster@ward.net

The .PRN files should load as long as there are descriptive text labels on the first row. Ask them to email you one file so you can try it out. Also, NeuroShell will read AIQ files in AIQ format. If the ticker symbols are the same as the ones on our historical CD, you should not have to download anything older than the last date on the CD files, because NeuroShell "glues" files together with the same ticker symbol.

If the ticker symbols are different (say on continuous contracts or indexes), that could be one reason to use Dial Data because our historical CD is provided by Dial Data. You can get the Dial Data account which only goes back to when your historical CD ended, which could be cheaper than the unlimited one.

**Re: End of Day Data Sources besides HistoryBank**

Date :8/16/2001 4:33:34 PM Poster : albertl

Thanks, 1)Yesterday Prophet sent the URL of their download server: "The URL for the service you mention is data.prophetfinance.com, the IP address is 207.33.55.106" Unfortunately I get the error messages : "cannot connect to data.prophetfinance.com" and "could not resolve host gluttony.prophetfinance.com###:11001"

2) regarding downloading with prophetfinance's own downloader I must say, they were quite helpful , if only I could find the currency indices , I would stay with them

3)downloading end of day data by means of a normal end of day downloader program seems now a luxury to me , in comparison with the real time quote.com service which I was using to pull the end of day data I say this to the intention of the friend in this discussion group who enquired about the different services quote.com is providing, I never found out if quote.com is providing an end of day downloading service and a corresponding downloader , or not. I suspect they dont . Does anybody have more info?

albertl

**Re: End of Day Data Sources besides HistoryBank**

Date :8/16/2001 5:05:03 PM Poster : webmaster@ward.net

Your problem connecting with Prophet Finance should be handled by tech support. Please contact them with complete details about exactly what you did to set up and run the downloader: support@wardsystems.com or call 301-6627950 9am to 12pm or 1pm to 5pm EST.

On 8/16/2001 4:33:34 PM albertl wrote: Thanks, 1)Yesterday Prophet sent the URL of their download server: "The URL for the service you mention is data.prophetfinance.com, the IP address is 207.33.55.106" Unfortunately I get the error messages : "cannot connect to data.prophetfinance.com" and "could not resolve host gluttony.prophetfinance.com###:11001"

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albertl

**Re: End of Day Data Sources besides HistoryBank**

Date :8/29/2001 3:37:09 PM Poster : albert stoffel

Hello Maxwell, Sorry for the delay 1)regarding Prophet Data they gave only this answer to my request for including currency indices in their stocks&indices package: "Albert, You're correct, these are not among the indices that we provide. I have submitted a request to add this to our database and also spoke with our data manager."

2)Regarding DOWNLOADING HISTORICAL DATA from QUOTE.COM : I have found this , but not tried out yet, under their QFEED service description:

"UTILITIES QcomBarData by Dan Dill A useful utility for downloading data from QFeed™ on a scheduled basis, regularly and automatically downloads daily or intra-day data from the QFeed™ data service into ASCII files for use in Dynamic Trader software (or any other software that can use ASCII-formatted text file data). SpreadMsg Lite by Compuquest, Inc. Monitor stocks, mutual funds, futures, currencies, & receive alert messages via E-Mail, Pager, Cell phone, etc. Your custom rules determine content and time of message delivery. Several more are in development -stay tuned... "

I was using QCHARTS BASIC previously, consider now going back on qcharts if this download utility can be used also with subscription to qcharts.

By the way ,quote.com is proud that we have to download each time we log back on " we do not have to keep the info on our computer" and this way " we do not loose any tick"

3) regarding CURRENCIES and FUTURES under qcharts basic

I still do not know if there is a way of getting these data are real time qcharts basic, I managed to see them only delayed, even though in livecharts they are real time to my knowledge, Does one need qcharts intermediate or may be qfeed can anybody help?

albertl

**Re: End of Day Data Sources besides HistoryBank**

Date :9/1/2001 4:58:29 AM Poster : Maciej

This is really a question for Steve. I've come across a source of data called Hyperfeed ([http://www.hyperfeed.com/f\\_main.html](http://www.hyperfeed.com/f_main.html)). Will NST be able to use this?

Regards

**Re: End of Day Data Sources besides HistoryBank**

Date :9/4/2001 8:35:42 AM Poster : Steve Ward

We've actually talked to the Hyperfeed people before. Unless something has changed, they are sort of a wholesale data distributor. If we purchased their data, we could resell it to you as you connected to a server we'd set up. At least at that time, they didn't sell direct to the individual trader. So we would have to get into the data feed business, like TradeStation Pro. It is always an option, but it would represent a big diversification for us.

**Historical Data**

Date :1/27/2001 7:51:46 PM Poster : snd

Thanks, but I was looking for Stock Data. I had heard in the past that pinnacle was very good as well.

### **Correlation**

Date :2/4/2001 1:29:22 PM Poster : scantley

So here's a wierd idea...

We have this GA hiding in our application here, and I wonder if there's any way to use it for other purposes.

For example, can anyone think of a way to take two or three indicators, and cause the GA to find parameters with the lowest correlations? Nothing straightforward comes to mind, but is there a subtle approach that someone can think of?

If not, then the folks at Ward might drop something like this into idea jar for version 4 or 5 or so. Trader is already configured to use the GA to minimize and maximize functions for predictions and trading strategies. It isn't that big a stretch to want to find a way to use it to outside of these two environments.

Anyone?

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### **Re: Correlation**

Date :2/6/2001 1:47:14 PM Poster : chris wong

i can do it by hand at least. i used the linear xy regression: coefficient of correlation indicator. i fed two indicators into it. then i changed parameters by hand until i saw correlation getting lower.

### **Re: Correlation**

Date :2/6/2001 2:05:59 PM Poster : Steve Ward

What you want to do is fairly easy with our GeneHunter product (maybe a little bit harder with three indicators instead of two). Yes it is embedded in the Trader Pro, and yes we might be able to figure out how to expose it to Trader Pro users in some future version, but in the mean time we have many users who supplement the Trader's capabilities with GeneHunter. They also use GeneHunter to optimize portfolios, build stock picking rules, and other types of indicator optimization that might not be possible in the Trader Pro. The downside: you have to be fairly proficient with Excel, because everything is not turnkey like it is in the Trader Pro. So if any readers of this forum want a copy now and not wait for some future version, I'll see if I can pull some strings and get you get a 20% discount off the \$395 price from now till March if you call or email me before then.

**Re: Correlation**

Date :2/7/2001 9:01:14 AM Poster : Maxwell Craven

I was wondering why you want to do this. All I can think of is that uncorrelated indicators might make better inputs to neural nets. However, the NSTP optimizer already crafts the indicators to make the nets work best, which might involve more than just being uncorrelated. Is there something I'm missing?



**Need for additional add-in program**

Date :2/4/2001 4:59:14 PM Poster : AlMart

Gentleman, I thank you for the product. It has tremendous potential. My biggest problem in making use of that potential is the fact that much of what I study calls for additional programming. While, I can do some of the programming myself, it is a long and arduous process because I am not good at it. My reasoning regarding trading tells me that I am interested in high probability patterns. I am not concerned with low probability or ambiguous events. If that means that I should only trade once every four days in a market that's perfectly fine with me. Therefore, I am looking for an interface that will allow me to use the trader and manually identify the patterns that are of interest to me. A few simple mouse clicks would provide me with the ability to focus your product on very specific patterns. Such a simple add-in feature would provide tremendous utility and avoid hours of programming. Proponents of Elliot wave would have the opportunity to capture regular or irregular wave counts with simplicity. Those traders who use price patterns along with volume or some other indicator would be equally happy. Exactly, this kind of approach using neural nets was raised in a Technical Analysis of Stocks and Commodity article by Jeffrey Katz, PhD (I believe). If this an upcoming product please let me know. I am submitting this suggestion because I am certain that there are many others who are looking for this type of a user friendly interface.

**Re: Need for additional add-in program**

Date :2/7/2001 9:15:29 AM Poster : Ward.net Webmaster

Our monthly newsletter has exciting announcements from time to time. Make sure your correct email address is on file here so you can read them.

**Re: Need for additional add-in program**

Date :2/7/2001 11:52:57 AM Poster : Floating Bear

The ideal way would be for Trader to interface with a low cost but high quality charting and T/A program, say, Metastock.

Any Chance?

**Re: Need for additional add-in program**

Date :2/8/2001 5:19:11 PM Poster : Texas Bubba

I really like the pattern recognition tip that Neuralshell put into the december issue of Stocks and Commodities. I think it was also in a Neuralshell newsletter too if I'm not mistaken. It uses lines to form patterns.

**Re: Need for additional add-in program**

Date :2/15/2001 10:46:06 AM Poster : Steve Ward

Yesterday we announced the new Fuzzy Pattern Recognizer Add-on in our monthly newsletter. It looks like it fits your need and then some in terms of being able to specify a pattern and then find it in a time series. How's that for fast response to customer requests? Although you can't actually draw the pattern on the screen, it is very easy to describe a pattern in fuzzy rules. The fuzziness also means that you get a probability that your pattern exists, not just a binary yes or no. That means it will even tell you that it found a pattern "somewhat" like your pattern. In addition, you can let the optimizer find new patterns you didn't think of yet.

**Re: Need for additional add-in program**

Date :2/16/2001 1:30:14 AM Poster : AIMart

Very impressive! I can't wait to try it. How soon do you think it will be before it is marketed?

**Re: Need for additional add-in program**

Date :2/16/2001 9:02:06 AM Poster : Steve Ward

We are taking backorders right now. The Fuzzy Pattern Recognizer is done and ready now, but it is based on the soon to be released NeuroShell Trader release 3.2 platform. Notice we also have fuzzy release dates like "soon". If we didn't, we'd be under pressure to release on a certain date even if all the bugs aren't out, and we'd rather kill the bugs than meet an arbitrary deadline.

**Fuzzy addin**

Date :2/27/2001 5:05:46 PM Poster : Xprogrammer Steve,

Will the fuzzy plugin that I purchased actually be shipped when the new release is out, or if not how long after that? I am very anxious to use it, because I have been looking for something like this. Any new fuzzy descriptions of the release date available yet? Are you up to "real soon" yet?

**Re: Fuzzy addin and new release**

Date :3/2/2001 1:50:53 PM Poster : Ward.net Webmaster

We are definitely in the "real soon" phase now, because the release is ready and we are cranking up production and trying to get our free web download set up. Start watching for it in the "Release news ..." section of this website. Once the CDs are made, the shipments of the Fuzzy Pattern Recognizer add-on will be sent first in order the purchases were made. Free release 3.2 CDs will be sent with the Fuzzy addon. Other users can download for free or we'll send new CDs for \$30 plus shipping.

**fast fourier**

Date :2/13/2001 8:58:26 AM Poster : chris wong

i have adaptive turboprop 2 addon that i purchased several months ago but just started using. it has an pretty good example that seems to do well with the fft fast fourier indicators. previously i didn't get much from fft but with at2 it works well even when no hiddens are put in the at2 nets. at2 help file says no hiddens is linear regression meaning it hasnt even gotten to the point of building a net and already good results. has anyone else had any experiences with fft outside of at2?

**Re: fast fourier**

Date :2/13/2001 9:28:22 AM Poster : Xprogrammer

I just purchased AT2 also but I have been concentrating so far on some of the other aspects. Not being an engineer, I don't know much about FFT. I have been interested in verifying the capabilities that the Neuroshell web site touts, like being able to optimize the output, number of hiddens, training set size, how often to retrain, and how far ahead to predict. Being an old (literally!) Neuroshell2 user, I understand the old neural nets pretty well, and I had even thought myself that NST should have had that flexibility before. I even considered programming backprop in a DLL, but my programming experience dates to the COBOL days. Have you done any optimizing of outputs yet? Any suggestions on what outputs to use that would benefit from optimization?

**Re: fast fourier**

Date :2/13/2001 4:34:57 PM Poster : Steve Ward

We frequently hear from people who say: "I am an old COBOL programmer, but I can't write DLLs." or "I have written Easy Language but I'm not a programmer."

Well, I'm happy to be the one to tell you you're more capable than you think: If you were a COBOL programmer you'll find DLLs in PowerBasic a snap. (Hey, I myself wrote thousands of COBOL lines of code in the early 70's, so I know what I'm saying!) And if you have written any involved Easy Language indicators, then you're practically a C programmer, and you'll have no problem with DLLs. Start now and greatly enhance your use of the NeuroShell Trader!

Why are DLL's so easy? Because there is no need to write input/output code. It is all calculation. You just get data streams from the Trader, and pass back an output data stream. No worries about dialog boxes, windows, or the like. It's a well defined clean environment to work in. Try it and see.

**Re: fast fourier**

Date :2/18/2001 2:33:02 PM Poster : Xprogrammer

I suppose you are right. I just don't have any idea what a DLL is and maybe that scared me a little. I'll try it because as you said it can't be that much harder than what many of us did in the "old days".

**Re: fast fourier**

Date :2/15/2001 8:12:35 AM Poster : chris wong

for outputs i just used change in open, which is the same one that was used in the

examples that came with at2. the parameter that gets optimized is change over what period. but then theres another lookahead period that optimizes too. i think you could use percent change too if you wanted or some stochastic.

### **Wanted: A Programming Language for NST**

Date :2/18/2001 5:07:24 PM Poster : Gary

I believe the NeuroShell Trader has changed. At first, it was merely a program to make it easy to use neural nets. Then, it got the genetic algorithms. Now it has a fuzzy logic add-on. NeuroShell Trader is becoming an all-purpose AI platform for the advanced trader. However, if the advanced trader is the target market for NeuroShell Trader, then it should be realized that an embedded programming language is necessary. Steve is right in telling us not to be afraid of DLLs, and encouraging us to try to C language and PowerBASIC. But nothing quite takes the place of language that is part of the program. It would be more tightly integrated into the functions of the program and debugging would be quite easy. To this point, a trading language has been mainly the domain of TradeStation. In fact, a halfway competent trading language is its main feature. But we should note that it is about the level of Turbo Pascal about 20 years ago. In terms of core functionality, TradeStation really hasn't improved for quite a while. And it is still the most expensive program there is in its field. And now the newest version wants to force us to use its data, and perhaps ultimately its broker. This is unacceptable to many people. I, among others, would be looking for a substitute. NeuroShell Trader would more than fit the bill if it had a trading language as part of the package. A few years ago, I got so frustrated with TradeStation that I sat down with Visual Basic and started to write my own programming language for trading. It was mainly Visual Basic, with several specialized routines included. It was not quite the equal of Easy Language, but it was after all just a hacked creation of one person. What surprised me was how easy it was to do such a thing at all. I wondered then and even now why no one has ever provided really good competition for TradeStation (though MetaStock has come close). It has more to do with the commercial side of things rather than technical feasibility. It requires an established player to take on No. 1. Like NeuroShell Trader for example. In my opinion, if NeuroShell Trader had a programming language, it would be so far superior to TradeStation that I and many other people wouldn't even bother looking at TradeStation. Only so much can be done even with artificial intelligence in simply banging indicators together. We need to be able to easily express any idea we can think of. Is it possible to have some way to do this that is at least as good as Easy Language? Certainly! For example, wouldn't it be nice to have a programming language that is also an expert system, the one missing piece that NeuroShell Trader doesn't have? To think of the possibilities is amazing. As is the difficulty --in any case, I would hardly expect to see NeuroShell Trader with any such improvements in immediate future. Yet the idea of NeuroShell Trader as the unparalleled platform of choice for the advanced trader, AI or not, is compelling.

### **Re: Wanted: A Programming Language for NST**

Date :2/19/2001 6:20:19 PM Poster : Michael Stigall

I said the same thing several years ago, when WS still taught NST training sessions in Florida. At the time, I recommended a scripting language to not only add new indicators, etc. (such as your programming language) but also to automate tasks within Trader. Each night, I update several neural nets and look for various criteria. I may decide to retrain the net and/or retune the trading system. I'd also like to rank the various neural net outputs (% change, 5 days out) to see which stock may move the most (percentage-wise). I still use Excel spreadsheets to track most of this on a daily basis, since I don't have the time to fiddle with PowerBasic now. I'd like to see a tool which would allow NST to kick off the stocks I'm interested in once their

end-of-day data is updated, train several nets at once, save formatted output results from each training session and then rank the results for me in the morning.

Perhaps as I get older, I'm also getting more lazy <grin>. I could try to code something in PowerBasic to perform the daily chores, but I also need to control the operating system (multiple windows with NST running several stocks at once), interface to other applications (Global Server or other databank), and also allow me to create ranking indicators for the reports (which it can probably already do).

**Re: Wanted: A Programming Language for NST**

Date :5/16/2002 4:37:42 PM Poster : Dave Hubbard

I couldn't agree more. Trade Station really disenfranchised many of the old users in the last couple of years. You guys have made a great product and could really give Trade STation a run for their money if you made a programming language for NST that could enable us to be more flexible with our systems and money management strategies! Perhaps even try to become compatible with all of TS's solution providers.

**Re: Wanted: A Programming Language for NST**

Date :2/20/2001 12:40:43 AM Poster : Victor Chu

Hi, I totally agree with Gary. A good idea will be to use VBA as a programming language, like Microsoft has used for MS Word and Excel. The user can then call COM objects from NeuroShell Trader, not just DLLs, to do what ever he wants to do

Thanks -Victor Chu

**Congratulations to NST user**

Date :2/22/2001 10:07:41 AM Poster : Ward.net Webmaster

Congratulations are in order to Scott McCormick who did so well with the help of NST that his story took a whole chapter in a new book. We thank him for revealing how he did it and giving away some of his techniques. See [www.neuroshell.com](http://www.neuroshell.com) for details.

**real-time forecasting -trading: comments**

Date :2/23/2001 6:31:31 PM Poster : Syl Dear friends Do you have any practical example of a working real time neural net ? It seems that the AT2 does not work at all even if optimized for real time trading but the the Pred Wiz works just fine but must be retrained manually at each n period. Did anyone had some success with the AT2 or other AI algos ? Thanks Syl

**Re: real-time forecasting -trading: comments**

Date :2/26/2001 8:15:28 AM Poster : chris wong syl:  
there are several posts on this forum now on that subject which you may have missed, including mine. just search for these terms: adaptive, at2, neural indicator. of course more examples from others would be nice too.



**SPY**

Date :2/24/2001 2:06:05 PM Poster : Maxwell Craven Does anyone know why I get 5 minute bars for SPY until 4:15 EST? Is it delayed 20 minutes or something? If so, how does that effect trading this stock?

**Re: SPY**

Date :3/11/2001 7:41:41 PM Poster : SMM Sounds like your quote.com account has not been upgraded for real-time exchanges. You can verify your quote.com account here: Lycos > Quote.com > My Account > Add Exchanges

**Re: SPY**

Date :3/12/2001 11:35:59 AM Poster : Maxwell Craven Thanks, SMM, you are correct. I am only signed up for real time with Nasdaq and Nyse. (Actually you have to select Account Mgt. instead of My Accounts, even though after you select the former it says you are in the latter!). However, I'm still confused, because other Amex stocks do end at 4PM and don't go to 4:15 like SPY does (at least those that have enough intraday data to fill the day). Have you any idea why the other amex stocks don't go to 4:15 too? Furthermore, Spy actually starts with the 9:05 bar like the others do, whereas I would assume it would also start 15 minutes late.

**Re: SPY**

Date :3/13/2001 12:42:38 AM Poster : W Smith  
I not sure why you are getting SPY quotes past 4:00PM EST, but I know the S&P futures contracts trade until 4:15PM to allow for final settlement prices, and/or after hours market developments. Perhaps the exchange allows after hours trading in SPY for the same reasons.

**Re: SPY**

Date :3/13/2001 8:03:21 AM Poster : Maxwell Craven  
Yes, it certainly makes sense that they would trade as long as the S&P does. Many thanks for clearing up this mystery that has bothered me. This forum certainly is a great place for novices like me to get help from others who know more! I had no idea that S&P traded until 4:15, and I don't think I would have noticed my delayed feed until I stopped building SPY models from data downloaded at night and started trading them during the day. In fact I didn't even know about SPY at all until I learned about it here. More thanks to all who are willing to add something to this forum.

### **Problem with Stops in Tader**

Date :2/27/2001 5:30:12 PM Poster : Cantley I'm having trouble implementing a stop strategy in Trader, and hopefully one of you folks will have a thought. I just can't figure out how to do what I'm trying to do, because the "Maximum Value" function only accepts integers for the window size. (Note to WSG: you need to allow indicators as inputs for some of these functions!) I would like to be able to take the maximum value of a function since entry into a trade and use it as a stop. For example, a moving average minus a normalized volatility. For a long trade, I'd like to be able to use something like that as a stop. It's entirely possible that I'm missing something obvious. Anyone offer some help? Or do I need to get a programming language and write it on my own? Best, Steve

### **Re: Problem with Stops in Tader**

Date :2/27/2001 8:50:54 PM Poster : Ward.net Webmaster The exact function you seek is in the new release. When you get it look in Trading Strategy:Position Information.

### **Re: Problem with Stops in Tader**

Date :3/7/2001 9:38:39 AM Poster : Cantley As promised, the function is there. It took me a while to figure out that I needed to not use the "since filled" version (which is what intuition would have had me use) but things are working the way they look like they should now, and my first attempt at a "real" trading system using this sort of stop is home training right now. Thanks for the new functions! Best, Steve

### **Re: Problem with Stops in Tader**

Date :3/7/2001 8:56:27 PM Poster : Scott McCormick  
Rather than use some formula for the stop, why don't you use that criteria as an exit criteria? That way you can program anything you want. After all, a stop is just reason to exit, and there is no real difference from that and any other exit criteria, except that a stop is a fairly rigid and mathematically mechanical way of doing it. But, I could be misunderstanding why you want to use it that way. If so, please post a more detailed explanation.

Scott

### **Re: Problem with Stops in Tader**

Date :3/8/2001 8:45:31 AM Poster : Xprogrammer  
That is what I do too. After Steve's encouragement that programming dlls in basic is not harder than programming Cobol and Easy Lang, I am starting to experiment with generating my entry and exit signals in a dll too. My ideas for buying and selling are too wierd for any conventional indicators anyway.

### **Re: Problem with Stops in Tader**

Date :3/8/2001 10:15:30 AM Poster : Randy Brown  
Is anyone willing to post a simple example of "generating entry and exit signals in a dll"? Just something to show the mechanics of how something like that works would be worthwhile to look at.

### **Entry signal**

Date :3/9/2001 9:30:45 AM Poster : Xprogrammer

Sure, Randy. Below is a simple one I built. It generates a buy signal whenever the close is higher than the open. This was just something I started with, but it's better to start easy. I just used Ward's examples to get me going. This can be used in a trading strategy as a long entry rule. The first line is pretty much just scary looking boilerplate that sets up the name of the indicator and the names and types of parameters that will be sent to it by NST. There are two parameters, cl and opn. BYVAL... AS DOUBLE is kind of a standard number type that NST can provide. (We programmers use scary looking notation like that in order to maintain our job security.) Then the code just returns a 1 (true) if the close is greater than the open, otherwise it returns 0 (false). When BuySignal is inserted as a long entry rule in NST, a buy signal gets put on the chart whenever a true is returned.

```
FUNCTION BuySignal ALIAS "BuySignal" (BYVAL cl AS DOUBLE, BYVAL opn AS DOUBLE) EXPORT AS DOUBLE
```

```
If cl > opn Then BuySignal = 1 Else BuySignal = 0 End If
```

```
End Function
```

### **Re: Entry signal**

Date :3/9/2001 7:47:10 PM Poster : Randy Brown

Thanks, Xprogrammer. It looks like a little effort to learn the language might be worth the increased flexibility to test all the weird ideas that I come up with.

### **Re: Problem with Stops in Tader**

Date :3/8/2001 11:13:49 AM Poster : Cantley

The answer has to do with whether you want to exit at the stop price, or exit at the open the next day. I'm not using the DayTrader, I'm using Trader Pro. I want to exit at the stop price. So placing it as an exit doesn't work right.

With the new functions that have been added in 3.2, I can do the exit right. I'm experimenting with a volatility exit. Close +/-~3 ATR as a trailing stop.

Best, Steve C

**Seminars and other training material**

Date :3/2/2001 12:21:27 PM Poster : Ian Orbell

Hi everyone,

Firstly, this discussion forum is great! I log in 2 or 3 times a week to see the latest input, and often find items of interest. So thanks to all who contribute, I hope to add some more comments of my own in the near future (I took a break since some comments back in October).

My question is...for those of us who never managed to make it to the seminars in Florida is there any way we can get the training material (for a price of course), or will the seminars or some similar event be planned for the near future? I have been avidly printing many of the forum emails, and reading all the separate help files, and going through the supplied examples. But I am sure there were many other aspects of the seminars that would be a significant extra education to even all those sources. I realise that the training material will not have the benefit of anecdotal input from other seminar attendees. Ian

**Re: Seminars and other training material**

Date :3/2/2001 1:59:01 PM Poster : Ward.net Webmaster

Now that release 3.2 is debugged and starting production we will be turning our attention to training. We have something a little different cooking you should like which we will try to announce by early April. Stay tuned.

**Re: Seminars and other training material**

Date :3/4/2001 3:29:18 AM Poster : Bruno Voisin

I hope, selfishly maybe, that it can be organised around several levels (Newcomer, Advanced, Programmer,...) for those of us who have attended the seminar already, and even better, with a early morning session from 4AM to 10AM for jet-lagged Europeans like me. Just kidding... :)

Bruno

**Re: Seminars and other training material**

Date :4/25/2001 7:59:26 AM Poster : Alan Gillies

Hi, Can I just back up Ians request I am based in the UK so travel and attendance to any US or indeed London based Training is not an option-I also would love to see some manuals/training guides to help us get the best from practical application of the great features in Neuroshell-I am at the stage now where I am able to do the basics but would love some guidance about using some of the tools in a more practical application.A book or manual would be great as it is easier to refer to -or a CD based interactive type training.Look forward to seeing what you guys have up your sleeve.

Alan

**Re: Seminars and other training material**

Date :4/25/2001 8:20:54 AM Poster : Ward.net Webmaster

We missed our early April date, but we are still close to announcing something we think many of you will like. Give us about 2 weeks more and we should have some information. We'll post the information here first, so please stay tuned a little longer.

**Re: Seminars and other training material**

Date :5/14/2001 3:29:38 PM Poster : Ward.net Webmaster We can now discuss the new training concept we have cooked up. There will be more details in our May email newsletter, due out any time now, but here is the overview: The new concept is one of online courses, called AI College(tm), where you can take a training course on the web any time you want in the privacy of your home or office. In addition to slides on the web, there are audio clips and video clips which are mailed to you in advance and installed on your computer with a special purpose browser. (They are too big to be downloaded). There will be a special forum for class discussions, and email communication with the instructor(s). There are those who will be very happy with this new concept, especially our users in Europe, Asia, and Africa, and our users who have trouble getting away for a few days. Tuition will also be less. However, for those who feel there's nothing like an in-person seminar, we still plan to have those in the future as well. The first online course will be an Advanced Course for the NeuroShell Trader Professional and DayTrader Professional. The May newsletter has a few more details or you can read more at [www.aicollege.com](http://www.aicollege.com). We hope you like what you read. PS: If you have changed your email address lately and didn't tell us, you won't get the May newsletter. Email tech support with your new email address and ask us to update your record in our database.

**Re: Seminars and other training material**

Date :5/16/2001 8:29:41 AM Poster : Ergo Mann  
Webmaster, re: Real-time Feeds/DataX

I was so relieved to read your e-mail regarding the future enhancements to NST and in particular the building of an interface to aid the capture intra-day tick data.

Presumably this will either supersede DataX or be an enhancement to it.

My request in an earlier posting for a refresh method for data sent to the NST can therefore await the development of your interface.

I completed my own system of sending data to the NST, but decided that the second option of updating CSV files was simpler and more rather than the DataX route, until such time as the refresh exists.

To this end I use my Visual Basic DDE client to send data to an Access database from the day trading software I trade with. Every minute a set of queries manipulate the data into the High, Low, Close and Open format.

For the sake of speed, I coded an ActiveX control of my own that updates end-of-day and minute-by-minute data in CSV files.

It would be better to call a method at this point to ask NST to refresh the loaded CSV data (re-load the CSV data) rather than have to close down the model and re-open it but this is a small price to pay for what is now a very good system that allows me to execute the best trades possible with the minimum of slippage.

One last point. When your new interface is available I will be able to extend the scope of this analysis from indices to stocks using the alarms built into NST. I look forward very much to its release.

Ergo

**Re: Seminars and other training material**

Date :6/24/2001 7:54:42 AM Poster : John Hegarty

I've had a very quick look at the AI College site. I understand that there is a fixed time in which to complete the course after which access is not allowed. What is unclear to me is what reference material, if any, would be available to me after the course completes.

Please advise if I would retain any course material for future reference.

Thanks

John

**Re: Seminars and other training material**

Date :6/25/2001 10:09:22 AM Poster : Ward.net Webmaster

John

You will be able to retain the video and audio clips, but you'll have to print the slides to keep them. After the 45 day class period, you won't be able to login any longer, but you could still play the clips while looking at the printed slides offline.

**Re: Seminars and other training material**

Date :6/25/2001 12:12:50 PM Poster : John Hegarty

Thanks for the quick response. This sounds fine.

Regards

John

## **Questions on Jurik Research indicators**

Date :3/12/2001 8:54:08 PM Poster : Michael J. Begley

I am considering purchase of Jurik Research indicators and have some questions for the group. I have read through the past threads on this and will summarize what I got out of it. For the record, I mainly use Excel and Tradestation to create trading models today but would like to use NST in the future.

Implementation of the Indicator: If I use the "Programmer's Generic DLL" form of a Jurik indicator, I would then be able to use this in NST by creating a template for it. This appears to be the best route to take since this would allow use of NST's GA to optimize parameters. I have not created any NST templates yet but it does not look hard even for a non-programmer. On the other hand, the "Tradestation" version of the indicator could be imported to NST but a prior post suggests that I would lose the ability to optimize the indicator parameters in NST with this approach. Is my understanding correct on these points correct? If I want to continue to develop trading algorithms in all three environments (Excel, TS and NST) it appears I am going to end up buying all three versions of each indicator I use. Does anybody see a path to reducing the number of versions needed for these three environments? I am not a programmer but it is difficult for me to believe that 1 dll could not have served all three of these environments.

Which indicators are useful? The indicators that seemed most interesting to me were: JMA - Jurik Moving Average: In this and other forums there seems to be almost universal support for this. VEL - Ultra-smooth Velocity: Not much discussion on this in this forum. Any recommendations? CFB - Composite Fractal Band: Jurik suggest this is useful as a measure of trend strength. One poster in this forum suggests it did not work for him. It seems to me that a good target for a neural net would be to forecast the change in the CFB. If the trend is forecast to weaken significantly, you may want to exit your market position. Has anybody tried this or any other uses? Any results - positive or negative? RSX - One negative post and one positive. Any other results - positive or negative?

I appreciate any experiences and suggestions you would like to share. Thank you.

Mike Begley

### **DLL SDK**

Date :3/15/2001 4:48:29 PM Poster : Ergo Mann Thanks for the DLL SDK. I successfully coded in C++ a complex DLL that took a lot of resource under Excel to calculate. Now I am able to fully automate a specific feature of my trading. Thanks again. Ergo.

### **Re: DLL SDK**

Date :3/16/2001 8:57:01 AM Poster : Xprogrammer Please let me also add my thanks to Steve Ward for urging me to take a look at Powerbasic DLLs. It wasn't hard, and I too am now able to easily code some of my specific ideas. So I think I will now see if I can do some C or C++. I did a little IBM 360/370 FORTRAN as well as COBOL in the old days, and it looks similar at least. The Xprogrammer

### **Re: DLL SDK**

Date :3/21/2001 12:55:31 PM Poster : JM Hi Xprogrammer, Before you jump into C or C++, which is not exactly similar to COBOL or FORTRAN, you may want to check out Delphi. It is a very cool tool, and is based on the Pascal programming language, simple to learn and use. And this variant of Pascal is Object Pascal, so you can use all those OO stuff that you can use with C++. Ward.net has a Delphi DLL example which you can download and study. Happy programming!

regards JM

### **Re: DLL SDK**

Date :3/21/2001 3:43:24 PM Poster : Xprogrammer Well thanks JM, I'll certainly take your advice. You sound like one of us programmers, true?  
The Xprogrammer

### **Re: DLL SDK**

Date :3/21/2001 8:13:37 PM Poster : JM Yep. I make my other half of my living by doing developments in Delphi :) I also use Delphi to write programs to pass realtime NS Daytrader predictions to TradeStation 2000i. Of course you can buy DataX from Ward to achieve this, but I guess I rather spend the \$249 on something more helpful to trading like the new Fuzzy Logic add-on :)~~~

The point I want to make is, once you've tried Delphi, you'll want to use it for all your Windows programming needs, and now, with the new Delphi for Linux called Kylix, you can do Linux programs too! Who knows, one day, NST may run on Linux! Good trading, my friend.

PS: I am in no way connected to Borland, just one programmer passing a good thing to another programmer :)



**Running under Virtual PC**

Date :3/16/2001 12:01:59 PM Poster : Jimmy  
Raineri Has anyone tried to run DayTrader  
under Virtual PC on the Mac OS?

**Re: Running under Virtual PC**

Date :3/18/2001 5:30:43 PM Poster : juan  
Not under MAC. However I have done this sucessfully using VMware. It runs slightly  
slower than the native machine but otherwise is great. You shouldn't have any  
problem. But then I am no Mac OS guru. Good Luck Juan

**other categories in the Data sources**

Date :3/18/2001 12:54:29 AM Poster : philippe bousseau It would be interesting to be able to create other categories in the Data sources wizard. As example if I have some EOD in the Metastock format, I can recover my data only in the miscellaneous instrument, with therefore mixed pell-mell of the files texts and files metastock. best regards

**Re: other categories in the Data sources**

Date :3/19/2001 8:49:30 AM Poster : chris wong philippe: i notice there are now about 20 categories in rel 321. also miscellaneous is just the default. you can easily change your folders to any category you want, even on the older releases, at least all the ones i have had. chris w.

**Re: other categories in the Data sources**

Date :3/19/2001 5:02:16 PM Poster : Texas Bubba  
I'll add to that one. Here's a little tip I realized and got it confirmed by Ward Systems for me. If you name your folder with one of the keywords, it will get defaulted to that category when you map it. So if your folder is named "Gold futures" it should get defaulted to the futures category, but if you name it "Gold stocks" it should get defaulted to the stocks category.

### **Free languages**

Date :3/19/2001 6:05:02 PM Poster : Gary It has come to my attention that there are two languages that may work with NST. They are free in their basic versions. I have not tried them yet -- time constraints -- but will do so and invite others to investigate also. Squeak -- A version of Smalltalk 80 Kicks out C code. You need C compiler of course to make DLL but don't have to mess with C. [www.squeak.org](http://www.squeak.org)

Dylan -- Simple son of Lisp, claims great power [www.functionalobjects.com](http://www.functionalobjects.com) Maybe as good as the big boys. Will do a DLL.

### **Re: Free languages**

Date :3/20/2001 7:51:56 AM Poster : Steve Ward Thanks, Gary, these are interesting. If anyone tries these languages, please post your experiences on this thread. Also, if anyone else knows of other languages in which it is easy to make DLLs, please post. Steve Ward

### **Re: Free languages**

Date :3/21/2001 1:00:52 PM Poster : JM Delphi from Borland. But not free, and not expensive either. They have a DLL wizard where the skeletal DLL code is already written for you, and you merely have to code the main body of what your DLL is supposed to do.

### **Re: Free languages**

Date :3/25/2001 3:24:10 AM Poster : Bruno Voisin I don't quite understand why everybody wants to leave C/C++ aside when it comes to DLL programming for the Trader. There are free C compilers, and programming a NST DLL does not require knowing much more than very basic programming instructions. No need to allocate memory, nor any need to delve into the exact data structures, as the data streams are already provided by the Trader. I would also be concerned by performance and code compacity if you intend having your indicator optimized the the Trader's Gen.Algs. Bruno

### **Re: Free languages**

Date :3/25/2001 7:17:37 AM Poster : Texas Bubba Say, Bruno, where can we get them free C/C++ compilers? Will they really do C and not C++? I used C some in college, but I flunked out before they got to the ++ part! Regards, Texas Bubba

### **Re: Free languages**

Date :3/26/2001 1:30:14 PM Poster : Bruno Voisin  
Hi,

I remember using LCC some long time ago, and I found it on Yahoo. I guess it is still free: <http://www.cs.princeton.edu/software/lcc/index.html>  
<http://www.geocities.com/SiliconValley/Heights/9069/index.html>

I don't claim to be very good at C/C++ I find C++ often easier to use though, and for

many reasons which would bore traders to death. So to make it short, there is virtually no need to work with classes to develop NST Addons unless you really want to challenge the Trader itself ;-). And as I said before, the data streams are provided by the Trader, and using pointers is quite straightforward and well described in the SDK. So, C is more than good enough for the job. Bruno

**Re: Free languages**

Date :3/26/2001 1:45:27 PM Poster : Steve Ward

Thanks, Bruno. We appreciate your contributions. If anyone tries one of these compilers, please report back to the forum on how it went.

**Re: Free languages**

Date :10/8/2002 3:52:47 AM Poster : Tom Nunamaker C++ compilers by definition are suppose to be able to compile C. The creator of C++ intended C programmers to SLOWLY migrate from C to C++. Add a class to your next project, try encapsulation on the next, maybe iostreams etc. He was surprised when people dropped C and went completely to C++. My brother does full time C programming but compiles his code in Visual Studio's C++ compiler. Now...where's that SDK.... Tom

**Re: Free languages**

Date :10/8/2002 9:19:13 AM Poster : Xprogrammer Look here in the section called New and Updated Examples. On 10/8/2002 3:52:47 AM Tom Nunamaker wrote: C++ compilers by definition are suppose to be able to compile C. The creator of C++ intended C programmers to SLOWLY migrate from C to C++. Add a class to your next project, try encapsulation on the next, maybe iostreams etc. He was surprised when people dropped C and went completely to C++. My brother does full time C programming but compiles his code in Visual Studio's C++ compiler. Now...where's that SDK.... Tom

**RE: Free Languages**

Date :3/23/2001 3:35:34 PM Poster : Gary I checked out squeak and Dylan. They are interesting but complex. I have to agree: For NST purposes the most user-friendly and cheap (if not free) alternative is Delphi.

### **EOD values in Real Time**

Date :4/19/2001 5:48:13 PM Poster : Maciej

Does anyone have an idea how I can catch the last tick / 5 minute value when running in 1, 5 or 15 minute intervals? In most instances I can count on the exchange close but this not always the case when handling sparsely traded items such as futures ie take the NQ series - right at the beginning the data is anything but complete. Currently my method is to track the time of day but it does not always work. Using the lead function does not seem a good solution either.

### **Re: EOD values in Real Time**

Date :4/20/2001 11:05:50 AM Poster : Xprogrammer I may not be understanding what you mean by "catch the last tick / 5 minute value" but I have always thought that the Day Close in the Intraday Basic category was the last tick of the day, after the day ends of course. Isn't that correct?

The Xprogrammer

### **Estimation of the "true" price**

Date :4/20/2001 12:12:59 PM Poster : aorn I would like to determine the "true" price, which is the "true" state of the market and use divergences from this to enter new positions.

The true price would be calculated as a 11 day centered moving average: the price you get at time  $[t]$  if you average datapoints from time  $[t-5]$  to  $[t+5]$ , i.e.

The problem is of course that today you only know datapoints  $[t]..[t-5]$ , it is here that the neural network would step in and based on earlier examples could predict the "true" state.

This would be something like a neural network based kalman filter.

Any ideas how to do this in Trader?

### **Re: Estimation of the**

Date :4/20/2001 2:33:53 PM Poster : chris wong

predicting the true price for today is really no different than predicting the open or the close for tomorrow. just build a true price indicator using the lead indicator to get  $[t+1]$  to  $[t+5]$  and the lag indicator to get  $[t-1]$  to  $[t-5]$ . then predict that zero days ahead. i'd use adaptive turboprop2 addon if you have it because it can retrain every day and keep the window moving forward. use whatever you want for inputs.

**BETA**

Date :4/24/2001 3:54:44 PM Poster : VINCE Does anyone trade any stocks base on their BETA?

Vince

**Re: BETA**

Date :4/26/2001 2:19:51 PM Poster : Texas Bubba Vince, do you mind explaining what is a BETA? I'll bet there's more than just me here who isn't familiar with a BETA. Where do I get one? Once I get it how do I trade with it? Is that like a BETA test?  
Bubba

**Re: BETA**

Date :5/1/2001 10:36:52 AM Poster : vince

The BETA of a stock is a risk measure comparing the volatility of a stock's price movement to the general market. Example: if a stock has a Beta of 1.25 it will probably move 25% more than the market.

**Re: BETA**

Date :5/4/2001 4:18:05 PM Poster : Ward.net Webmaster In order to make it easier for our users to answer Vince's question, we have put a tip on this website showing how to compute Alpha and Beta with NST.

### **Monte Carlo Simulations**

Date :4/25/2001 8:21:05 AM Poster : Alan Gillies

I have started(very basically) reading about the above and wondered if they can be used somehow in NST-either by someone a lot smarter than me writing a programme or indeed via anything that already exists.Failing that is this an add on that Ward may be considering sometime ??Forgive me if this is a naive question as I am one of the users of NST who is grateful that you do not have to be technically gifted to use the programme.

Cheers

Alan

### **Re: Monte Carlo Simulations**

Date :4/26/2001 9:32:10 AM Poster : Texas Bubba Alan, I am maybe even more naive than you, but I am just a country boy. Do you mind explaining what is a Monte Carlo Simulation?

### **Re: Monte Carlo Simulations**

Date :4/26/2001 6:14:18 PM Poster : Alan Gillies

Hi Texas, Will do my best but I am sure there are probably people in this forum who are way better versed in this area than me.My basic understanding is that a MCS is a methodology that attempts to use a real random process along the lines of flipping a coin to achieve a non random deterministic result.What a MCS does is apply a very large number of different randomly generated scenarios to your trading strategy or scenario and sees what the aggregate results are -theoretically this means that you should, using this type of analysis come up with a trading strategy that is able to perform better in all the different types of scenarios that a market may go through and minimises the (albeit slight) chance that when you backtested your strategy it just so happened to fit using the data that you used but may not be something that would be replicated repeatedly. Probably a very poor description or example and maybe some other folks could do a better job-hopefully though it gives you an idea of what I was referring to.

Alan



### **Question from a beginner**

Date :4/25/2001 12:56:15 PM Poster : Claude ChereI

Hi everyone,

Sorry if my question seems to be basic to those of you who have a lot of experience, but I need some help and I guess this forum can be a source of answers.

As a new NeuroShell Day Trader user, I have a general problem. I generally cannot get more than 40 or 45% of profitable trades in my predictions. Perhaps I make a mistake but I don't see which one. This is the kind of prediction I do:

- . Look for % change, or optimal % change, or optimal buy/sell on open, 10 minutes in the future.
- . Optimization methods: I used all of them (full optimization, parameter search, input selection and no optimization).
- . Inputs: Momentum indicators (AccumDist, CCI, MACD, etc.), but I also use others (regression, change, moving averages, etc.)
- . Training criteria: Max training set 1 week, minimum 2 days, 1 walk-forward test of 1 day.
- . Objective: Maximize Return on account, both long and short, optimal trading rules, optimize on training set
- . Trading size: 1 share, no trading costs
- . Max number of hidden neurons during training and during optimization: 10

Is there an error? Are the training criteria too large?

I tried this with AMAT and CMVT on 1 minute bar chart. Should I use another periodicity?

I know I have to test with several stocks, but I want to know if I do the right things before to go to this following step.

Thanks in advance for your help, every advice will be welcome.

Claude

### **Re: Question from a beginner**

Date :4/26/2001 9:28:46 AM Poster : Xprogrammer

Hi Claude

When you say 45% profitable, are you talking about the evaluation period? If so, then maybe that's the problem. You said walkforward is only 1 day. Seems like that's not much to get many trades going, unless the stocks you are trading are pretty volatile. Why don't you try a week?

Also, when I was a beginner, I didn't start right away with the optimizer, because the Ward group advised against it in something I read. I'm thinking you might be over optimizing because the training set is only a week. Try training with maybe 2 weeks. Try without optimizer, then use only parameter search with a few inputs. That is what helped me in the beginning. Also, Ward advises somewhere I read to use more than just a couple of stocks.

### **Re: Question from a beginner**

Date :4/26/2001 10:55:38 AM Poster : Claude Cherel

Thanks a lot Xprogrammer for your answer, it gives me a way.

When I say 45% I am talking about the Percent Profitable Trades in the Trading Statistics page of the Prediction Analysis. I am concerned about this because if I am not able to make more than 50% profitable trades without trading cost, then I have no chance to make even a dollar with the costs ... I tried to increase my training set and my walkforward test but the result is almost the same.

I guess the last part of your message is THE way! I have to do my predictions with a reasonable number of stocks. This will be my work for the coming days.

Thanks again for your help

**Re: Question from a beginner**

Date :4/26/2001 1:55:39 PM Poster : chris wong

here's more things to think about claud. i'm not a statistician but i don't believe that if you flip a coin to decide when to get in and out of a trade that you'll necessarily average getting 50% of them profitable. it isn't the same as getting 50% heads and tails. markets don't always go up or down, or stay up or down until you get out.

furthermore, what if your nets are only getting 45% profitable trades, but the profitable ones are making twice as much as the unprofitable ones are losing? i'll take that any day.

the last thing is to be careful about which net you are clicking on in the training results (walkforward vs current vs outofsample). they all have different stats.

chris

**Re: Question from a beginner**

Date :4/27/2001 2:05:14 AM Poster : claud cherel

Chris,

Thanks a lot for your input. I generally look at the outofsample result. Is there a special way to analyse all the nets (walkforwards, current and outofsample)? I look for a minimum of consistency in between all of them, is there something else I should look for?

Claude

**Re: Question from a beginner**

Date :4/27/2001 9:34:11 AM Poster : chris wong

claud, look at the thread on this forum called what issue to pick - a useful procedure????? i use variants of that with appropriate changes for intraday bars, since that procedure was laid out for daily bars. i also like yours.

chris

**Re: Question from a beginner**

Date :4/27/2001 9:38:02 AM Poster : Maxwell Craven

Claude:

Maxwell Craven here. Some months ago Steve Ward advised me to be sure to

include some subjectivity and common sense in my decisions about when to trade a model. He says he often just eyeballs the results to see if they make sense, ie, no real dumb trades or big drawdowns along with a reasonable profit. I have found that useful advice.

Maxwell Craven

**SMACD, PMACD, BlauCSI, EngodicSignal(sp) ???**

Date :4/26/2001 5:44:15 PM Poster : Steve K

Daniel Lyons posted a bitmap and short explanation of his Trading Strategy at <http://www.ward.net/cgi-bin/viewuserstips.asp?ID=4>

It had some nice buy/sell signals. Any ideas on creating these custom indicators -- SMACD, PMACD, BlauCSI, EngodicSignal(sp) -and incorporating them into a Trading Strategy??

New NSDT user here.

thx, Steve

**Re: SMACD, PMACD, BlauCSI, EngodicSignal(sp) ???**

Date :4/27/2001 9:55:23 AM Poster : Xprogrammer

Well he gives the formula for the BlauCSI, where I assume EMA is exponential moving average? That is pretty easy to put in NST in the indicator wizard part. I'm not familiar with the others.

**Re: SMACD, PMACD, BlauCSI, EngodicSignal(sp) ???**

Date :3/3/2003 5:47:15 PM Poster : Tom Nunamaker

Is SMACD or PMACD explained anywhere? I have both of Bill William's books but neither of these indicators appear. Has anyone come across these?

Tom Nunamaker

**Re: SMACD, PMACD, BlauCSI, EngodicSignal(sp) ???**

Date :3/4/2003 12:12:44 AM Poster : Steve in California

Listing @ Amazon:

Momentum, Direction, and Divergence by William Blau (Author) Product Details  
Hardcover: 160 pages ; Dimensions (in inches): 0.69 x 9.37 x 6.28 Publisher: John Wiley & Sons; 1 edition (March 6, 1995) ISBN: 0471027294

See also for discussion of some indicators resembling some of Lyons indicators.

[www.dacharts.com](http://www.dacharts.com) [http://groups.yahoo.com/group/HD\\_RDforDummies/](http://groups.yahoo.com/group/HD_RDforDummies/)

**Re: SMACD, PMACD, BlauCSI, EngodicSignal(sp) ???**

Date :3/4/2003 12:47:18 PM Poster : Tom Nunamaker

Thanks Steve. I'll check out Amazon. I also stumbled across [www.dacharts.com](http://www.dacharts.com) yesterday. Interesting site.

Tom Nunamaker

**Re: SMACD, PMACD, BlauCSI, EngodicSignal(sp) ???**

Date :3/4/2003 4:39:31 AM Poster : Daniel P Lyons check pages 122 and 123 of Trading Chaos by Bill Williams. I simply added the letters S and P to the MACD for identification puposes only when I was eliminating methods a few years ago. The SMACD is an oscillator created by Tom Joseph using settings 5/35, which was modified by Bill Williams to use settings of 5/34, whereas the PMACD is a MACD using settings of 5/34/5.

Daniel

**Re: SMACD, PMACD, BlauCSI, EngodicSignal(sp) ???**

Date :3/4/2003 1:57:57 PM Poster : Tom Nunamaker Daniel, I was reviewing the formula on the CandleStick Indicator page you submitted and there appears to be a discrepancy in the formula you gave and the BlauCSI indicator:  $100 * \frac{EMA(EMA(Close-Open,r_0,s))}{EMA(EMA(High-Low,r),2)}$  yet your indicator is:  $BlauCSI(Close,Open,32,32,High,Low,32,32,32,100)$  This leads me to believe there is an additional EMA in the denominator of the indicator. Do you perhaps have a corrected formula? Getting off subject, you mentioned multiple time frames in an old post. Do you have any thoughts on effective ways of combining multiple time-series together? Thanks in advance Tom Nunamaker

**Re: SMACD, PMACD, BlauCSI, EngodicSignal(sp) ???**

Date :3/6/2003 3:54:41 AM Poster : Daniel P Lyons Tom, Re: Blau, I can provide the template files to support for upload if would like them so you can experiment with them. There are 4 templates in all and each has its role. They can also be found in William Blau's book, "Momentum, Direction and Divergence". Re: MTF's. Actually, this is a complex topic and one that requires access to "All Sessions" data in my opinion. Most information on the topic simply discusses merged datasets and overlays which is rather a simplistic view on the subject. Based on my experimentation in other fields such as voice recognition and hand print recognition I designed and built a proprietary method for handling MTFs. This allows me to handle issues such as data alignment in a more complete way. Such issues becomes more relevant when building training sets for nets etc. regards, Daniel

**Re: SMACD, PMACD, BlauCSI, EngodicSignal(sp) ???**

Date :3/10/2003 1:03:05 AM Poster : Tom Nunamaker Daniel

Regarding MTF: You say "All Sessions" data. Are you referring to sessions outside of the "normal" trading window? Your work using voice and hand print techniques sounds interesting. Are you using these techniques to reduce noise and then combine the time series together? Are you decomposing the signals via wavelets or some type of low pass filter?

I've read papers on merging time series together but the results looked similar to just adding the different time frames together, which I assume is NOT what you're doing. Does the voice/hand print recognition field have mechanisms for merging time series together in a more useful manner?

Tom Nunamaker

**Re: SMACD, PMACD, BlauCSI, EngodicSignal(sp) ???**

Date :4/27/2001 1:31:32 PM Poster : Daniel P Lyons Steve, the SMACD and PMACD was supplied courtesy of Bill Williams. The remainder are courtesy of William Blau. The signals for that particular strategy are very simplistic but are fairly reliable. I only trade futures and currencies and hence deploy several proprietary "leading" indicators for identifying/generating signals. The above indicators are "lagging" indicators but serve a purpose. I believe you require a balance between leading and lagging in order

to obtain consistently reliable returns. I find the NSTP to be excellent for testing indicators and strategies so don't be afraid to experiment, good luck, Daniel

**Thanks from the beginner...**

Date :4/27/2001 11:51:38 AM Poster : claude chere! Many thanks to all of you for the nice ideas I received. This forum is really a big help! Now I've got to do my homework...

### **Futures Symbols**

Date :4/28/2001 5:48:23 PM Poster : Dave Johnson The NSTD Pro futures list is incomplete. Someone here posted something about adding symbols, but not how they do it. Can someone explain how this is done? (I don't remember a help file about it, but if there is one, please someone say so)... Dave Johnson

### **Re: Futures Symbols**

Date :4/29/2001 2:24:27 PM Poster : Texas Bubba Dave: I don't know if its in the help file but theres a tip on here called Adding ticker symbols to quote.com what explains it all for you. I used it before and it works. Bubba



### **Slow Optimization using JMA in adaptives**

Date :5/1/2001 12:56:25 AM Poster : Chris Niemann Is anyone experiencing extremely slow optimization when using a Jurick JMA in either ANI or AT2 add ons. As soon as I add the prediction or classification, my whole system seems to bog down. The simplest tasks, like hiding data, seem to take forever. As far as trying to optimize an adaptive, Fuhgetabout it. Looking at 8 - 10 hours. I am a newer user but it seems like there is something wrong. I'm running on a 600 pentium. No problem with neural inds and JMA. Trying cluster out now.

Any tips on speeding up aside from clearing out the files as suggested? Is there a dramatic difference running on Windows 2000 vs Windows 98?

## **Clusters**

Date :5/6/2001 4:31:35 PM Poster : Dave Johnson I have been spending much time trying cluster indicators with both intraday and daily data. I have had numerous cases of trading strategies that optimized very well, with even extraordinary results, but then did not forward test very well. Typically I have tried clusters with price momentum inputs, MESA inputs, regression inputs (similar to example 4, with lagged regression pseudo-trendlines), etc. There are two approaches that I have tried so far: First, to use one cluster indicator as an entry signal for long, another for short. Second is to use a set of cluster indicators -- with fewer inputs -- and then require multiple signals for entry. This strategy can then be optimized for "rules" in the strategy. The best optimal results have come from the single indicator approach so far, but the forward test problem remains. I have been typically using a small set of stocks for this analysis, but have also tried indices and index futures (for intraday). Another issue is that of optimization time. When building a strategy with optimized stop losses, exit targets or signals, etc., the computation time can become very large. (I am running on a 1.2 GHZ athlon with 512 MB). Anyone have suggestions for cluster strategies that seem to improve the forward testing performance? I am sure that, if I could run more optimizations (cpu limited) I could find solutions, but I don't yet have multiple computers running NSDTP! Dave Johnson

## **Re: Clusters**

Date :5/6/2001 5:07:14 PM Poster : Texas Bubba Dave, as I mentioned to the other guy earlier, the Wardgroup has put up a new tip called "When optimization is really slow". Did you read that one? Since you have stop losses, it looks to this country boy like you're affected too!

## **Re: Clusters**

Date :5/7/2001 1:55:24 AM Poster : Claude ChereI Dave,  
As Texas Bubba mentioned, I read the tip on the slow optimization and my strategies now are not long to compute. I do not use anymore stops, trailing, etc.  
I have just a question, what kind of dates do you use in the trading strategy parameters for: start of backtest, size of backtest and range of data used to optimize trading strategie? I use the defaults and I get some pretty good results but perhaps it is a mistake and I should not use the defaults? Do you know?

Claude ChereI

## **Re: Clusters**

Date :5/7/2001 10:55:23 PM Poster : Dave Johnson Claude, I am typically basing the dates on the number of bars, limiting it to between 1000 and 3000 bars. This obviously changes the dates spanned depending on the bar size. Then I typically use 15 to 25 % of that length further out as a forward test (backtest in NST speak). I typically use fewer bars for daily data -- as the market personality probably changes over such a time -- and more bars as the bar length becomes smaller. Regarding the slow optimization, I have had this problem both with and without using stops. I have tried strategies which simply reverse on opposite entries, and others that use stops or more complex entry rules. It can be that the time is sometimes multiplied by the stops, but I don't think this is the essence of the

problem. The question remains...any suggestions of cluster strategies that forward test with about the same success as the optimization? Perhaps my choice of forward test length is too long, and the optimization should be carried out to a point closer to the latest bar, in order to capture as much of the current personality as possible. Thoughts? Thanks for the responses from Tex and Claude. Dave Johnson

**Re: Clusters**

Date :5/8/2001 1:46:39 PM Poster : Maxwell Craven I get results with clustering that carry forward better when I use fewer "inputs". In that respect, I suspect that they are like neural nets, that you can overfit if you use too many. Maybe that will speed up optimization for you as well. What often helps for me is trying a different set of equities.

**Re: Clusters**

Date :5/7/2001 8:52:47 AM Poster : Ward.net Webmaster To all: Speaking of running multiple computers running NSDTP, we are now able to offer a 40% discount off list price on second, third, etc. copies of the Trader, Trader Pro, or DayTrader Pro that you purchase for yourself or at your same company!

### **When is a system good enough to Trade?**

Date :5/6/2001 6:03:48 PM Poster : Stephen

All, When is a system good enough to Trade? Unless you all are doing better than me, my systems never have 100% winners. My trading system development could use more structure. Does anyone have a checklist they use before releasing a system to trade? - Stephen

### **Re: When is a system good enough to Trade?**

Date :5/11/2001 1:14:46 PM Poster : chris wong stephen, look at the thread on this forum called what issue to pick - a useful procedure????? i use variants of that checklist with appropriate changes for intraday bars, since that procedure was laid out for daily bars.

chris

### **Re: When is a system good enough to Trade?**

Date :5/11/2001 4:08:07 PM Poster : Tagster We could all use more structure in our approach. All trading systems development is both an art and a science. You should look to cultivate or adopt some form of market philosophy. There are many types on this board subscribing to different views on what moves a market and how to capture that information for forecasting price movements into the future. For one it helps to have an idea of what role each indicator or input plays into your overall approach. Giving the GA free reign is far from a reasonable solution. (you should have an idea of the parameter ranges and indicators that fit a particular role.) - I love the add ons!!! The relationships between a system and a market are complex and go beyond what we see in the analysis window (the scientific approach). Visual inspection of the signals provide insight into the thinking behind the buy/sell signals (the artistic approach). It is best to try to integrate these two when trying to create a meaningful system. As far as a system that has %100 winners I would be extremely sceptical of it. Markets are not perfect and systems are far from perfect. Look for meaningful errors, smart trades that lost money. Markets demand a flexible approach this is where the art comes in. Scientific methods are more rigid and are best for creating the framework or basic structure for an overall system or approach. Cautionary note - When we engage in visual inspection be well aware of the fact that our eyes naturally wander to the big moves and great signal and often completely ignore periods where the system gets chopped up. As far as the big moves goes: Who's system isn't firing when Ciena it gaps up 6 points. The best systems put on smart trades in quiet periods. See my post on filtering bad trades, I made today as a separate issue. Knowing when not to trade and why can be as important than knowing when to trade. Personally, I am on the artistic side and trying to work toward the analytic. (the first month I had NSDTPro I was afraid to even open it. To this day I am still afraid of dll's and VB code, even though I have a handle on easy Language. For me it is simply a mental block I will overcome by necessity as I need to code more involved ideas. I would also like to add my vote to update the look and feel and possibly the background color. It is, however, soothing. Tagster

### **Re: When is a system good enough to Trade?**

Date :7/2/2001 6:01:03 AM Poster : albertl

Hello, Isn't a system good enough when in out of sample period of 12 months

most of the "intermediate size" tops and bottoms are hit? A look at max draw down  
in back test and out of sample also helps  
aint that good enough? albert

### **Self-discipline**

Date :5/11/2001 6:20:49 AM Poster : claude chereI

Let's say I get a good trading strategy with more than 70% profitable trades, reasonable drawdown, good number of trades, and good return on account. When I look at the graph, my mind sometimes does not agree with the generated signals. Then I tend to find perfect buy and perfect sell signals. Doing so I begin to loose confidence in the trading strategy.

Don't you think that the correct behaviour would be to "stick to the rule", to buy or sell when the system says and not to panic when the drawdown increase in the limits of the strategy? And rebacktest regularly to keep confidence!

Thanks, Claude

### **Re: Self-discipline**

Date :5/30/2001 7:09:58 AM Poster : Bruno Voisin

Claude, You should do some paper trading for a while first. There is no way you can trade your system for any length of time if you do not feel 100% comfortable with it. Having said that, the learning curve does include a number of inevitable painful adjustments on your side, and tweakings on the system side. There is also the well known dilemma between aiming and shooting. You can aim forever and never pull the trigger. We all tend to hesitate too long if the system is not in line with you risk profile.

My rule of thumb is to trade the system if you are comfortable with only 1/3 to 1/2 of expected gains, and if you can sustain 2 to 3 times the expected max drawdown.

Bruno

### **Re: Self-discipline**

Date :6/5/2001 5:30:07 AM Poster : claude chereI

Thanks Bruno for your answer. It helps!

## **Slow optimization**

Date :5/11/2001 12:58:55 PM Poster : Steve Ward

That's a scary hardware problem Steve K told us about on May 10 in the DataX thread. I've heard of computers going into "sleep mode" overnight while they're supposed to be optimizing, but never that!

Below is another few sentences we'll be adding to our tip called "When optimization is really slow." Maybe this will help some of you whose optimizations seem to be dragging, or at least help you know why:

Another reason optimization can be slow is if you are using one of our addons, like Adaptive Turboprop 2, and loading it up with inputs or hidden neurons. The addons are far more computationally intense than the normal indicators are.

For example, suppose you are using Adaptive Turboprop 2 with a training set size of 1000 bars, and you are retraining every bar. Your optimal set contains 10000 bars. This means that EVERY individual in the genetic population has to have 9000 neural nets trained for it on every generation, each with a training set of 1000 bars. Especially if you are using more than a couple of hidden neurons, that can take quite a while, even with our fast nets!

Many of our users like to build a hierarchy of addons. They'll feed Adaptive Turboprop 2 nets into cluster indicators, etc. That's ok, but it produces a whole lot of variables that need to be optimized, not to mention the additional computational intensity.

### **Filtering Bad Trades**

Date :5/11/2001 4:48:39 PM Poster : Tagster

There has been recent discussion about expanding the length of trades to that a system doesn't overtrade. Most of the ideas treat the symptom but might not effectively remedy the problem. Bad trades are part of life. I mentioned in another post to look for meaningful losers when developing a system. The fact that we are attempting to address complex non-linear environments with simple buy/sell threshold has limitations. Down the road we will need to address more complex forms of normalization (perhaps fractal related -any ideas, programmers?).

One way to minimize bad trades is to stay out of the markets more. The flat position is under utilized by most traders. There are simple periods where a market is going nowhere or is going crazy.

Again, probably fractal related, and again welcoming any ideas or input on this matter - hurst, CFB (jurick), Chandre CMO, Commodity Selection Index???? Any ideas? Success stories with these???

The allways in the market philosophy is a curious one. Although it is easy to think about, it is something of a linear approach. The SP500 is a common offender market for traders. Many have a personal vendetta with it. Unless you have consistent success, Steve Ward will tell us that we should look for markets to better suit our models.

Market exist in a multidimensional space. As energy (volatility) expands the geometric confines (boundaries) are tested and typically violated. These confines can be illustrated on our charts as trends, support, wedges etc. More importantly these confines exist within our systems and they are continually being tested in the ways of signal (many of which are bad) Noise is also where the leading information lies.

The second way to filter bad trades is to have an additional entry/exit rule after a signal is given to validate the move. I prefer "close only stops". Buy if close > high of the signal bar (I'm using intraday). I could do this in Tradestation, I have yet to achieve this in NSDTP. I am experimenting with the trading strategy information in the indicator wizard and setting up two systems, an initial and a validator. It is probably not too hard. I might need some help in this department for the good of the people. Close only stops filter out noise as markets typically run for stops. I actually add a little room like a 1/4 above high , depending on the market

Thanks for listening

Tagster

### **Re: Filtering Bad Trades**

Date :5/12/2001 12:58:05 PM Poster : Steve K

Tagster -- I've run into the same problem

When I enter I trade I like to use a tight stop like Trailing Price: Percent -- this SHOULD let the good trades run and get me out of the bad trades quickly However it uses the high of the period to calculate the stop and many times when a stock begins to move there are trades outside the best market(especially with the new penny increments).

As shorts rush to cover and longs want in they start hitting the ecns. One high or low trade followed by a trade at market and a tight NSDT stop gets hit and u missed the move. If we could set the the stop to be calculated at the close, these



highs and lows would be filtered out and the trade could run. When following the trade in realtime you can see these bad prints and ignore the NSDT alerts, but it's a hindrance in optimizing a profitable strategy.

It would be nice to set this with a trailing stop indicator but maybe there's another way to do it too -- If I find it I'll pass it on

In the Price Basic category you can select Price Low and if the price drops lower than the lowest price over the the last n periods you'll get stopped out. This is only a partial solution because if you are fortunate enough to pick the exact bottom as a long entry point you'll get stopped out immediately because the entry price is lower than everything in the prior periods.

Any other ideas?

Steve K

**Re: Filtering Bad Trades**

Date :5/14/2001 2:09:59 PM Poster : Ward.net Webmaster

Note that the new release (3.21) we added the Min/Max value since Entry indicators in the Trading Strategy: Position Information category. By using these, you can insert any time series or indicator in place of the high and come up with trailing stops like Min Value Since Entry ( Mov(Close,3) ) if desired. Maybe this will help you.

**Re: Filtering Bad Trades**

Date :5/14/2001 9:23:15 PM Poster : Steve K Thanks for the idea -- I came up with the following and placed it as my only rule for a long exit SELL LONG CONDITIONS:  $A < B(\text{Close}, \text{Mul}2(\text{MaxValEntryAct}(\text{Trading Strategy \#2}, \text{Close}, 1), 0.995))$  It's suppose to trigger a sell when the close falls 1/2 percent below the highest close after the buy was triggered. This is a stop that should be triggered on any pullback but It only works 90%. One time it let the stock run 24 hrs and drop 2 points, then the sell was triggered by a BAD print two points above market. Is this a bug in the software or is there something wrong with the way this rule is being implemented?. This is the only rule I was using so there is nothing else interfering with it. It's just a basic tight trailing stop based on highest closing price. thx, Steve On 5/14/01 2:09:59 PM Ward.net Webmaster wrote: Note that the new release (3.21) we added the Min/Max value since Entry indicators in the Trading Strategy: Position Information category. By using these, you can insert any time series or indicator in place of the high and come up with trailing stops like Min Value Since Entry ( Mov(Close,3) ) if desired. Maybe this will help you.

**Re: Filtering Bad Trades**

Date :5/15/2001 1:52:46 PM Poster : Ward.net Webmaster The rule looks ok, and we aren't aware of any bugs. You should submit your chart to tech support. Send the data too by exporting a text file so they can see the exact same thing you are seeing, and tell them where you see it on the chart please.

**Re: Filtering Bad Trades**

Date :5/16/2001 9:02:42 AM Poster : Steve K I deleted the data for that stock and let NSDT rebuild it and that seems to have solved the problem for now. Quote.com filters out bad ticks, but it's not an instantaneous process. Qcharts will correct the chart real time when a bad print gets filtered. If you're building your charts real time during the day it might not be a bad idea to occasionally delete the underlying data so you can build a strategy on filtered data with no bad prints.

### **Re: Filtering Bad Trades**

Date :6/25/2001 4:47:20 PM Poster : albertl Hello tagster, Why are you not happy with the following obvious solution you surely have tried: add supplemental predictions to the trading strategy, thus reducing the number of all signals, or, in order to be even more often out of the market, use logical OR on the exit signals, meaning, put 1 or 2 out of 4 in the strategy wizard under exit signals if you have inserted 4 predictions. (the fourth prediction for example would not need to be used for entries). albert

### **Re: Filtering Bad Trades**

Date :6/26/2001 4:15:09 PM Poster : Tagster Hi Albert, Faster exits are a workable approach to exit sooner. However, sometimes it may knock you out of a good trade (not letting profits run). Multiple models or the panel of experts approach is interesting and I have experimented. Right now I am trying to combine two custom neurals or cluster with neural to make a more accurate system. I think that by asking for a validation above the high or below the low of a signal bar you are adding a market response dimension to the overall function. I feel that an arbitrary threshold of say zero should be permeable without always signaling a trade. (letting the function flow freely). This helps alleviate the quest for perfection because it doesn't exist. Sometimes patterns look strong but the market thinks otherwise and a failed signal is important to notice and often means a counter move is imminent or the market is simply not ready. Still having trouble with the GA. I have created an outstanding system for Ciena using the approach above and cannot, for the life of me, replicate it in other markets with successful walk forward results. Even matching all initial weightings and settings. Tagster

### **Re: Filtering Bad Trades**

Date :6/30/2001 10:50:10 AM Poster : Michael Stigall  
Tuscar Chande has an article in this month's Technical Analysis of Stocks & Commodities which talks about using standard deviation of the stock's price as a determinant towards exit prices. I like this method since a) the STDEV will vary as the stock volatility varies, b) the engineer in me likes a statistical method which adapts to different market conditions over the long term and c) you can explore your win/loss ratios at various exit points (2x stdev, 1.5x stdev, etc.) to find a comfortable drawdown. Take a look!

### **Re: Filtering Bad Trades**

Date :7/2/2001 6:23:50 AM Poster : albertl  
Hello Tagster, You seem to like the artistic approach, will give soon detailed comments and try to figure out some of these contradictions I see in your dislikes towards voted exits for the mean time, try acceleration % on DJI av and add it as an

input to your predictions...somewhere it might boost your CIEN to 1000% if the other inputs permit. Tell us with what couple of other inputs it works at your end. albert

**Re: Filtering Bad Tades**

Date :7/2/2001 10:57:09 AM Poster : Tagster

Thanks Albert, I'll give it a try. I have noticed that I may not have been allowing optimization to run long enough. Stopping after ten minutes simply does not work when you are working with a recurrent. It takes time for all the weights to balance. And optimal walk forwards need time to work through as you sill see the % optimized drop backwards as optimization shifts to the next Optimal walk forward layer. I'll try acceleration and see where it goes.

Tagster

**Re: Filtering Bad Tades**

Date :7/3/2001 3:21:32 PM Poster : tagster

Albert,

Comment on using index information as an input to a model for a stock. I am not a big fan of intermarket analysis. I beleive the relationships are far more comlex or random than many financial engineers would like to admit. Further more, markets have become more fragmented over time. The old adage "It's a market of stock not a stock market" is a cliché but a relevent cliché. When you move away from a stock towards an index you are moving away from the more relevent or leading information to general and lagging. You could perhaps use the SOX index when trading Intel or Broadcom. This might be closer to underlying market forces surrounding an issue.

Good Luck Tagster

## **Excessive Memory Usage**

Date :5/18/2001 4:41:11 PM Poster : Steve K

At the end of the day NSDT came to a crawl and started lagging by as much as 6 min using 2 min bars -- qcharts was running fine so there weren't data problems on qfeed. I am a long time user of qcharts so I understand the past problems with this feed and how to resolve them. Everything on qcharts end was running fine so I looked at memory usage.

--NSDT was using 165 meg of memory and over 70%-95% of cpu processing. --To clear up some memory I removed 2 stocks bringing the total monitored down to 9. No memory was released. --After market close, I shut down the chart window and kept NSDT running, NSDT was STILL using over 100 meg while it's not doing anything. --I closed NSDT and restarted it, NSDT was using only 17 meg at startup --Reload the chart and NSDT is using 97 meg.

Why is NSDT using so much memory (165meg) and not freeing it up when charts are closed and symbols deleted?

I had one severe memory leak a few days ago where memory usage soared to over one gig in a matter of seconds and brought the computer to a crawl till I could manage to shut down NSDT. I don't know if the 2 issues are related but I am more concerned about the 1st problem which seems performance related vs the 2nd which so far only happened once.

Everything else is running fine and I've been getting some nice tradeable signals

Any thoughts on the memory issue?

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## **Re: Excessive Memory Usage**

Date :5/18/2001 5:29:17 PM Poster : Ward.net Webmaster

Qcharts could certainly have been using a different server than NeuroShell, but if not, any type of memory thrashing lockup needs to be examined by our tech support experts. Please send your chart so they can see what is in it and try to reproduce the problem.

In general, there are several things that users can do to avoid using a lot of memory to begin with. Lots of walk forwards in neural nets use lots of memory, as does loading and displaying too many bars, all compounded by multiple chart pages. Displaying too much data is much worse than loading too much. Lots of things hidden on the chart add up too - get rid of indicators, nets, and strategies you are no longer using. NeuroShell has no limits on what it will let you try to do.

**Re: Excessive Memory Usage**

Date :5/18/2001 6:32:37 PM Poster : Steve K

It's a proprietary chart so I'll try to explain: It has: -- 1 trading strategy with a few rules, no nets or add-ons. -- 4 charted indicators -- buy/sell indicators -- 1 hidden indicator -- 1 unused Prediction that i am developing, 5 walk forwards -- 1 hidden unused trading strategy with a do nothing rule -- used for setup so I can copy it & not have to reenter my defaults to a new strategy

NSDT can't copy/paste rules and strategies between charts so, although I don't have much in it it has been thru a lot of iterations and development and backup copies. Do these charts continue to grow in complexity internally even tho unused indicators/predictions/strategies are deleted vs manually rekeying everything into a fresh chart?

There's also the issue of NSDT not freeing memory when a chart is closed and nothing loaded.

thx again

**Re: Excessive Memory Usage**

Date :5/19/2001 8:03:15 AM Poster : Ward.net Webmaster

Your problem is going to have to be taken up by tech support; please contact them to see how the problem can be tackled. We'll ask our programmers to check if there's any issue of memory not being released in general when charts are closed.

In answer to the general questions, if strategies and nets are deleted, their memory is supposed to be released, so all unused items should be deleted, even if hidden. Although you cannot copy and past a strategy to another existing chart, you can do these things:

1. Save the chart as a template in the Template folder, so that strategies, indicators, etc, can be reused again and again.
2. Save indicators as custom indicators so they can be pasted into other charts and other chart strategies.
3. If you think a rule might be used again, save it first as a custom indicator, because rules are really just indicators. Then it can be used in aother chart strategies.

**Re: Excessive Memory Usage**

Date :5/19/2001 1:05:12 PM Poster : Daniel P Lyons

I too have experienced similar problems. I once loaded a chart with 2 indicators which had a max. of 4 variables per indicator. I did not utilise any nets and was attempting to optimise the variables etc. After 12 hours I cancelled the program. Total memory consumption was unbelievable so I also suspect there maybe a memory release issue somewhere. Oddly enough I do not recall the same problem in the former version,

Daniel

**Re: Excessive Memory Usage**

Date :5/22/2001 8:33:19 AM Poster : Steve Kratochvil

Here is what I have found. The actual memory usage does get up to 150meg but it holds there. I have a 1gig CPU and 256meg ram. I have never ran out of memory but my CPU is slammed to 100% normal operation and it never comes down. I am looking at a Dual processor setup with 1gig ram to try and level things off to at least 50% normal operation levels.

**Re: Excessive Memory Usage**

Date :5/31/2001 12:02:34 AM Poster : Steve Kratochvil I agree with Steve here. I am getting the same kind of performance. I have not gone out and thrown hardware at this problem yet and I don't want to. Any thoughts would be greatly appreciated.

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**Re: Excessive Memory Usage**

Date :6/21/2001 10:21:10 AM Poster : JES I am experiencing the same problems as described by Steve K. I need to exit and restart NSDT to regain memory and CPU availability several times per trading day. This problem may have started after I installed the Windows 2000 Service Pack 2.

Thanks and good trading,  
JES

**Re: Excessive Memory Usage**

Date :6/21/2001 1:11:45 PM Poster : Ward.net Webmaster We'd really like to get our hands on your chart in tech support so we can see what's going on. Pls send to support@wardsystems.com.

**Re: Excessive Memory Usage**

Date :6/28/2001 4:18:40 PM Poster : JM Hi all, You all may want to try this tool for recovering lost memory due to ill-behaved applications, memory leaks or memory fragmentation. It's called MemTurbo. You can download it at [www.memturbo.com](http://www.memturbo.com). Quite a piece of good software. I used it on my customer's web server to monitor and rectify excessive memory usage, automatically. Hope this helps.

JM

**Re: Excessive Memory Usage**

Date :6/28/2001 4:46:07 PM Poster : Ward.net Webmaster Our technical support dept. reports that to date nobody complaining of excessive memory usage or failure to release memory has actually sent in a chart so we can reproduce such a problem. We aren't doubting that it happens, but it probably happens only in certain cases. We also need to verify it isn't just taking a while to release memory. For excessive memory, we need to make sure there isn't just a lot of things in the chart, or maybe years of 1 minute bars. In any case, we'd really appreciate actually having something to work on here. On 6/28/01 4:18:40 PM JM wrote: Hi all, You all may want to try this tool for recovering lost memory due to ill-behaved applications, memory leaks or memory fragmentation. It's called MemTurbo. You can download it at [www.memturbo.com](http://www.memturbo.com). Quite a piece of good software. I used it on my customer's web server to monitor and rectify excessive memory usage, automatically. Hope this helps. JM

**Re: Excessive Memory Usage**

Date :8/13/2001 6:12:31 AM Poster : albertl

Hello Steve, try this: REDUCE THE FOLDERS AND STOCKS the trader IS MAPPING or exit the trader each time in the task manager. I am running the simple trader on windows 98 + AMD 188meg. Originally my Trader was mapping all tickers and folders of the CD-ROM . (default setting) The trader was always staying in my memory after exiting the program normally!

Just for fun I managed to have the trader up to 5 ( five) times in the task manager. This in 188meg, without loading any chart though. I do not know why the mapping of the folders containing the data is done so extensively at each start of the trader, it takes an eternity and blocks the memory as far as I can see , even if one charts only one stock. Since I have reduced the mapped folders to a minimum ( I do not use the CD presently) only 20 stocks but plenty of indices, my trader exits are absolutely clean and the start up is fast. Hope I was of some help. albert

### **The Lead(X,n), Predict3 and Prediction Net**

Date :5/24/2001 4:46:49 AM Poster : Jacobs

I'm playing around with an ANI indicator and the Lead indicator.....

I made a net (Prediction Wizard) trying to predict the %Change(C,1) 1 day into the future. As input Predict3 (ANI indicator) was used with the following settings: Lookback = 30 Lookahead = 0 Actual = Divide(Sub(Lead(C,5),Close),Close) Input #1 : %R(H,L,C,9) #2: StochasticSlow%D(H,L,C,2,7,2) #3: RSI(C,9) Contribution factors: 15.2, 11.1, 8.8 Trainingset: 3years with 1 wfd of 1 year. Objective: Maximize Return on Account, Long position only.

The result (too good) indicates I'm feeding the answer back into my Prediction net, but I don't understand why, where and how.

I thought the Prediction net used, as input, the prediction/estimation of the Actual (made by Predict3) not the Actual value itself. In the walkforward period there shouldn't exist any values of the Lead(Close,5)? , they exist only in the Training period or ?

I get exactly the same result if I use Divide(Sub(Lead(C,5),Close),Close) as input instead of Predict3?

As soon as I set "days into the future">number of days in the Lead indicator I get more normal results.

I don't see where the answer (correct value of the Actual) is fed into the Prediction net.

### **Re: The Lead(X,n), Predict3 and Prediction Net**

Date :5/24/2001 9:04:35 AM Poster : Ann

Maybe this note from the Adaptive Net help file explains it:

If you set the lookahead period to zero, then the Net predictions are no longer out of sample, because the Net sees the output in the same bar it sees the inputs. It is essentially just memorizing. If you set lookahead to zero and set the contributions high enough, the Prediction Nets can exactly reproduce the outputs. The Classifier Nets will get the probabilities 100% correct.

### **Re: The Lead(X,n), Predict3 and Prediction Net**

Date :5/27/2001 10:16:18 PM Poster : Jacobs

Thank you for your answer. I have searched the help file a couple of times but not found those lines. Exactly where did you find them?

### **Re: The Lead(X,n), Predict3 and Prediction Net**

Date :5/30/2001 9:08:57 AM Poster : Ann

The details are in the topic "Using Adaptive Net Indicators with NeuroShell Trader". Ann



### **Betting Strategies**

Date :5/24/2001 10:35:12 PM Poster : Cantley

Would anyone care to discuss betting strategies that work with neural network systems? I've been struggling with the idea a little bit. I've yet to find a stop that really makes sense for a trading strategy, and without a stop, it's hard to know what your real risk is on a trade. And not knowing what your risk is makes it difficult to decide how large a position to take on.

What has worked for others?

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### **Re: Betting Strategies**

Date :7/30/2001 12:31:27 PM Poster : ANNATS

I just flush all my signals through Tradestation and then evaluate it in Portfolio Evaluator 2000. as far as implementing different strategies you can then export the files into Money Manager 2000. good books along these lines are Maximum Adverse Excursion by John Sweeny, and all of the Ralph Vince books.

### **Tough going with GA**

Date :6/11/2001 9:25:55 PM Poster : Chris Niemann I am having extreme difficulty enabling the optimizer to work in my favor. Everything I am doing seems to make sense and I can create great looking neural and clustering indicators without any optimization. When I try to build a prediction of optimal change in close for (160) 5 minute bars (actual looks like a healthy fitness target) using CCI's or MACD's of different values to essentially express non-correlating fractal forces fed into a sparse net and a cluster. Optimizing return on account with 6 months of data smallest set (2 weeks) with 5 optimal and 5 regular walk forwards (2 weeks) with 6 neurons adjusting for trending markets The optimizer always seems to get completely lost and I am better off without optimization. Another thing I will try to do is groom a single neural indicator by predicting optimal change in close 160 5 min bars with Zero neurons hoping to improve over the default values. Still lost and need some guidance. Perhaps I am trying to make things overly complex but my desire is to use a few intelligent indicators with a few hidden versus piling on basic indicators and neurons I know I am close and hope there is probably something small that I'm missing. I know the inputs are great the data is good and the fitness and set sizes appear to be reasonable. Any guidance or tips, I have read most of the info online and in the help files. Thanks, Tagster  
P.S. Thanks Steve K. I had been looking for the the DMI's for neuroshell.

### **Re: Tough going with GA**

Date :6/12/2001 9:13:25 AM Poster : Xprogrammer I don't know what you mean that the optimizer gets "completely lost" but it was always my impression, and it seems to be the case, that if you build a strategy and THEN optimize it, that the optimizer starts with the existing solution in its "pool" of solutions. I'm not sure I'm using the correct terminology here, and I could never begin to even understand what you are doing, but it appears that the optimizer should not get worse than what you already have, not on the part being optimized anyhow. Maybe you are seeing your out of sample results "get lost" as you optimize better and better? If so, that's a whole 'nother kettle of fish.  
The Xprogrammer

### **Re: Tough going with GA**

Date :6/12/2001 3:11:50 PM Poster : Tagster Let me clarify. The optimal percent change in close for 160 five minute bars looks and seems like a reasonable fitness. Maybe this is the problem. I am adjusting for trending markets using multiple two week walk forwards (5-6) By getting lost I mean that by itself a neural indicator looks reasonable. If optimizing and it finds two or three periods where wild numbers bump up the end result then those wild numbers are its idea of the best numbers that will test forward well and generalize only they have little to do with the future. Maximize return on account is the goal. I am unsure what else to try. Maximize return on trades has typically produced unusual responses but I will experiment further. Perhaps I'm being overly idealistic but I would hope the optimizer The inputs I use might be overly complex Clusters, waves or recurrences that seem track market buy and sell points and classification of bullish or bearish quite well out of the box (no optimization. I usually use only one or two inputs into a prediction or strategy with under 8 neurons. This seems reasonable to me to reduce overfitting and strive for powerful inputs to begin with without over reliance on the GA or the hidden. Perhaps I'm in the woods here. Each night I pray and try to persist. feel informed,

and yet clueless Looking for clues, Tagster

**Re: Tough going with GA**

Date :6/12/2001 4:29:17 PM Poster : Chris Niemann Quick comment. I had been using 6 months of 5 min Basr as a max and 2 weeks as a minimum. The two weeks may be simply too small to model and the GA will optimize for an isolated environment. Now trying 2 months as a minimum looking better. This may have been the culprit. Also I use 5-10 2 week optimal walk forwards with 4-6 walk forwards. Not sure if this is an issue but seems reasonable. Welcoming any suggestions Tagster

**Re: Tough going with GA**

Date :6/13/2001 9:21:33 AM Poster : Xprogrammer

Ok, so the optimizer is not finding things that work into the future. I am also assuming by "wild" you mean the optimizer latches onto some really good situations in the optimal walkforwards that probably don't occur later very often. I see this sometimes too - there'll be a big jump during optimal and the optimizer learns it can make more money just buying before the big jump, regardless of what else it does. (Forgive me for trying to be so logical - I'm an ex-programmer!).

I'm also going to assume your nets aren't too complex, because I'll never understand your clustering and fractal forces. So my idea is to stop using the optimal change in close, because during the beta I noticed Ward had that as a default but then it wasn't by the time the release came out. Must have been some reason they did that! Plus, it isn't clear how far ahead you're letting this optimal change in close go, but it sounds like 160 bars ahead you're predicting. I'm not sure so far ahead is good, but I have to emphasize, I'm no expert either!

**Re: Tough going with GA**

Date :6/13/2001 10:47:57 AM Poster : Texas Bubba Sometimes another objective function helps.

**Re: Tough going with GA**

Date :6/26/2001 4:43:02 PM Poster : Tagster Thanks TB XP, Beleive me, I am no advanced TA snob. I do however beleive in looking deeper by accessing longer term information along with the shorter term.

I use the term fractal in a loose sense. To me fractal means pattern within a pattern. Steve ward had created succesfull models simply using 5 RSI's with different values. I would call that a fractal approach (again loosly). Dr. Elder in "Trading for a Living" uses MACD's of different values (I beleive he multiplies by a factor of 5. A moving average crossover system is referencing two different time periods within a time series. This method used to be effective in the eighties and prior when markets where more structured. Murray ruggiero has demonstrated in his book that this method has since become challenged by current markets. Implying that a deeper approach is required.

I am a firm believer in simplicity to start with, address market complexity or chaos and return to simplicity (buy, sell, bullish, bearish etc). my method is similar to the above along with adding a some price regression (slope) readings fed into a neural or a cluster. Using < 10 neurons and 2-3 inputs. The neurals and clusters look good prior to optimization and seem to get fouled up during optimization. Meaning that the GA will give a 250% + return and the walk forwards are abysmal.

The difficulty I am experiencing lies in either what I am trying to predict or the default fitness of maximize return on trades. Predicting optimal % change in close. I have also tried JMA smoothed 30 period momentum (all on 5 min charts) 6 month max and 1 month min with 5 WF's and %owf's of two weeks seems reasonable?

I have created an exceptional model for Ciena and cannot seem to replicate it in other markets. Very frustrated as I keep running into a wall. Feeling rather foolish in that I know this software is powerful and I know my ideas are strong but they ends don't seem to want to meet. Maybe it's off to AI Summer school.

Any pointers on fitness and what to predict.

### **type of data for prediction**

Date :6/26/2001 3:33:35 AM Poster : claude cheryl Just thinking about the kind of data to input to a prediction. Let's say, If I would predict the sales of beverage, I would probably look at the weather, the day of the week, the season, the day of salary, everything which could have an impact on the sales... But I will not use the past sales as input. Don't you think it should be the same for a stock? In order to predict the near future of a stock I could use S&P, NSDAQ, Tick, TRIN, DJI, whatever I think it could be in relation with my stock. But the past values of the stock will only be the output data of the Neural Network, I will not use these data as input. A lot of indicators (rsi, stoch, macd, moving averages, etc...) are just another way to present the past values of a stock, so I should not use the stoch indicators as input to my neural network. If I want indicators as input then I should use S&P Stoch, Tick Moving average, DJI macd, etc. but nothing coming from the stock I want to predict. Do you have any comment? Am I in the right way? Thanks a lot in advance for sharing what you know. Claude

### **Re: type of data for prediction**

Date :6/28/2001 4:30:37 PM Poster : Steve Ward Claude: I, for one, agree that for sales prediction, you would never use past sales as inputs, since past sales have little if anything to do with new sales. The other factors you mentioned will be far more predictive. I think in theory, the same should be true of stock market predictions. The big question is - do the S&P, NASDAQ, etc. actually affect the stock price in advance? I don't know the answer. Certainly, interest rates in various countries affect exchange rates and bond prices. Probably oil prices affect the stock price of oil companies. Maybe the price of DELL affects the price of Gateway or Compaq. Weather certainly affects commodity prices. What about insider trading? I believe rather strongly that buy recommendations of brokers are a self-fulfilling prophecy for reasons that aren't hard to imagine. Therefore, sentiment indicators should be pretty good too. On the other hand, the reason old prices might affect coming prices is because of greed and fear. If the price is low, greed may kick the price up. When the price climbs too high, fear drops it back. Therefore, you can argue that for stock prices, past prices DO affect future prices. This is certainly a topic worthy of more contribution and ideas from other users. Steve Ward

### **Re: type of data for prediction**

Date :6/29/2001 3:32:24 AM Poster : claude cheryl

Thank you very much Steve for your interesting answer. Now time is coming to find out the correct indicators. Where could I find an exhaustive list of sentiment indicators? I know a few but certainly not all of them. Claude

P.S. Even if S&P, Nsdq, DJI are not always predictive, I sometimes get good results.

### **Re: type of data for prediction**

Date :6/30/2001 11:15:22 AM Poster : Michael Stigall Oops. I realized that I didn't pull the conclusion on the timing of indicators back to your question. Not enough caffeine this morning. We know that Mr. Greenspan has a tremendous affect on the market. How often does the Fed change interest rates? If you try to predict daily stock price change and relate it to interest rates which may change monthly or quarterly, then you're essentially limiting your stock prediction to "old" data or even worse... trying to train a neural net with data which seems to have high importance but only affects the stock

price \_when\_ the interest rates change.

You could try to build an indicator which counts days until the next Fed decision, and guess at the change... But now you're getting into a lot of data massaging for an indicator which only pops up every few months.

#### **Re: type of data for prediction**

Date :7/1/2001 4:02:03 PM Poster : Allan Orn Reading the works of old masters like R.D. Wyckoff, Edwards & Magee you will see a lot of discussion along the lines of "waves of greed/fear", together with "trade with the trend". I think that these concepts are still very useful. When developing a neural (or other system) is a good idea to get the concepts in place before blindly picking some of the many available indicators. Technical indicators tend to make certain price action stand out, i.e. oscillators signal price action away from a short term balance point while moving averages signal possible trend starts. Depending on the trading concept chosen, it is best to add indicators that "amplifies" the tactical information that your system needs. Regarding the possibility to predict future prices based on past prices: The academic community says it is not possible, most traders say it is possible but loose money, a few traders are able to do it but keep the methods to themselves. /al

#### **Nasdaq predictions as input to stocks**

Date :6/30/2001 7:37:29 PM Poster : albert stoffel

Nasdaq predictions as input to stocks Does anyone know how to trick the Neuroshell Trader into predicting index/futures and then using these predictions as inputs to a stock model, without having to export the index predictions into a file and reimporting them into the stock model? Thx albert

#### **Re: Nasdaq predictions as input to stocks**

Date :7/2/2001 8:53:41 AM Poster : Maxwell Craven

I don't understand, Albert. Predictions are right there in NST so you can stick them into any place you want without exporting anything. I do it all the time. Just put the out of sample net into a rule or indicator or whatever. If you have adaptive turboprop you can stick that in anyplace too. If I'm not understanding exactly what you are doing, please explain further.

#### **Re: Nasdaq predictions as input to stocks**

Date :7/3/2001 4:05:29 PM Poster : albertl

Hello Maxwell, special thanks, your answer makes me look forward to a brighter future with neuroshell..

The following were  
my question to  
support and the  
answer by  
support:> ( I am  
using the simple  
trader),

Q: how do I predict the NAS in a chart for CIEN for ex., then use this prediction as an

input for Cien strategy or prediction?

A: You could not predict NAS in a CIEN chart. The only way would be to create another chart for NAS, export the results to an ASCII file and then use the values in the ASCII file as inputs to your CIEN strategy or prediction.

**Re: Nasdaq predictions as input to stocks**

Date :7/3/2001 5:41:22 PM Poster : Maxwell Craven

Albert - well, I guess Ward Systems is right, since I didn't pick up on the fact that you were predicting something for which the chart wasn't built. HOWEVER, they are only right with respect to the Prediction Wizard. You can do it with the adaptive turboprop2 addon; I just tried it! The prediction wizard makes an assumption about the issue being predicted, but AT2 makes no such assumption! It is much more flexible I'd say. Does that make me smarter than Ward Systems???

**Re: Nasdaq predictions as input to stocks**

Date :7/3/2001 6:11:36 PM Poster : Ward.net Webmaster

After reviewing this further, we have determined that it is possible to do this in the Prediction Wizard. You build the chart for the stock. Then insert the index as "Other instrument data." Then when you go to predict the index, you have to select "Other data/Indicators". There you will get a chance to select the Close for the index. You will probably want to make sure the inputs you use are based on the index as well. Therefore, the index prediction winds up in the chart, and you can then use the out-of-sample net, just as Maxwell originally said. No need to export or import, since you keep everything in one chart. But there are a few things to keep in mind:

1. The Prediction Wizard Training Results screen will indicate the ticker symbol of the issue with which the chart was originally built.
2. If you train on profit, all trades will be based on the issue with which the chart was originally built.

**Re: Nasdaq predictions as input to stocks**

Date :8/11/2001 6:32:40 PM Poster : Steve Safigan

I know this reply is late, but if you're still monitoring this group for an answer, I might have one. I've just gotten started with NST myself, but this seems to work:

Add a stock as the primary chart, then add a subchart as the index. Write a prediction for the stock, but only use indicators for the index. For instance, instead of using %change(close,1), use %change(close of nasdaq index,1). Do this with all of the indicators in the prediction. Although NST will call this a prediction for your stock, it will actually be a prediction for the index, since all of the inputs relate to the index, not the stock. Now you can use the prediction you built as input into a trading strategy for the stock.

### **Category Inputs**

Date :7/3/2001 12:05:35 PM Poster : DickDanger

I would appreciate any help available with the following.

I have been trying to determine the best way to input the day of the week to my neural net. I have tried using a single input (1=Monday, 2=Tuesday...5=Friday) and I have tried using 5 binary inputs (1,0,0,0,0=Monday, 0,1,0,0,0=Tuesday...). Using a single input works poorly, which is probably expected. However, using 5 binary inputs, although better, is not all that good either. I created a simple artificial data set, where the output should be able to be predicted perfectly if the day of the week is known. Even using 5 binary inputs, results were mediocre. Anyone know why, or any other ways to tell a NN the day of the week?

Thanks, Dick Danger

### **Re: Category Inputs**

Date :7/3/2001 3:16:40 PM Poster : Steve Ward There are two difficulties with binary inputs:

1. They add a lot more variables, and
2. Turboprop2 is optimized to make continuous valued predictions, and continuous valued predictions work best with varying numeric data. So predictions are hard with binary data, especially if there aren't lots of other inputs. The single input approach is not good because it violates the 8th Commandment (see Tips and Techniques on this site.) However, if you code the day in a single input so that the day number increases as some important characteristic of the day increases, it might work better. Suppose, for example, you believe trading volume makes discrimination by day important. Suppose further that trading in your issue is heaviest on Friday, followed by Monday. Suppose Wednesday is light, but Tuesday and Thursday average the same trading volume, but are lighter yet. Then I'd try Tuesday=1, Thursday=1, Wednesday=2, Monday=3,

Friday=4. Better yet, I'd assign a number based on average trading volume, perhaps scaled between 0 and 10. Then you might wind up with something like Thursday=0.67, Tuesday=0.81, Wednesday=1.22, Monday=8.64, Friday=10. The other thing you can do is try some of the other neural net types that are in our add-ons, especially the ones that classify instead of predicting. Classification generally works better with binary inputs than prediction does. Adaptive Net Indicators and Neural Indicators classify, so they might be better with binary inputs. Anyone who wants to be really

serious about neural nets should own as many addons as they can afford. (I use them all, but of course I get them free.) I actually prefer classifying the market rather than predicting the price, and usually do better that way too. Steve Ward



### **Transformation and scaling**

Date :7/4/2001 6:06:26 AM Poster : Claude Cherel Hi everyone, What do you think about transformation and scaling ? If I use indexes like DJI, Nasdaq, S&P, as input to a prediction, the values can be very different (10570, 1850, 1245). Can I use these raw values or is it better to transform them? I use two things:

- .  $\ln(\text{divide}(\text{Close}, \text{lag}(\text{close}, 5)))$
  - . scaling between -1 and 1
- Is it important to do this kind of transformation for NeuroShell Trader or does the product deal with raw data without any problem?  
Thanks,

Claude

### **Re: Transformation and scaling**

Date :7/9/2001 2:20:58 PM Poster : webmaster@ward.net The NeuroShell Trader help file includes a topic called "Neural Network Output Discussion". The comments and methods applied to outputs may also be applied to inputs.

### **Re: Transformation and scaling**

Date :7/12/2001 10:47:47 AM Poster : Steve Ward

Claude:

Actually, scaling is already being done similarly and automatically to inputs and outputs by all of our neural nets except Adaptive Net Indicators. Scaling is NOT being done OUTSIDE of neural nets. The webmaster's comment is about normalizing over time, which isn't being done by NST to inputs, although certain outputs are pretty normalized, e.g., percent change in open. Your formula seems to scale, which isn't necessary, but it also does a little normalizing over time too, so the formula may help and probably won't hurt anything.

However, an alternative to normalizing over time is not going so far back to when the issue was trading at an entirely different level. Frankly, I think the trading patterns for DELL, for example, were a lot different before the big bull market, and changed again when the bear market started. So I don't think normalizing over time always helps.

### **Re: Transformation and scaling**

Date :7/13/2001 3:50:19 AM Poster : claude cherel

Thank you Steve for your clear answer. Now I know what to do about scaling and normalizing on time.

For the second part of your answer, I understand that I could use raw data like close, open, volume ... if I decrease the number of bars for each input. Then in this case I do not have to normalize over time, right?

To resume I identified three types of transformation:

- . Scaling : where a formula is used to reduce data (0 to 1, or -1 to 1, etc...) - This is normally done by NST inside neural nets.
- . Normalize over time : where a formula is used between the last data and some other data in the past (using lag() for example) -This can be avoided if you decrease the level of observation.

. The 3rd one : where a formula is used between the data and the moving average for the same bar. In this last case is it scaling or normalizing?

Thanks, Claude

**Re: Transformation and scaling**

Date :7/13/2001 10:28:19 AM Poster : Steve Ward

Claude - the third case you mention is what I would call normalizing over time. I tend not to use just open, high, low, close and volume. I usually at least use percent change in these things to get some time normalization for them, unless the price range has been pretty narrow during my training or optimization period. That's because scaling only serves to make sure all neural inputs are in the same range, but scaling does nothing to resolve the fact that a \$1 move is not a big deal when the stock is at \$150, but it was a big deal when the stock was at \$10. Think of scaling as normalizing over many inputs (vertical), whereas time normalization normalizes over one variable (horizontal).

**Re: Transformation and scaling**

Date :7/16/2001 11:24:36 AM Poster : claude chereI

Thanks a lot.

### **looking unduely into the future**

Date :8/3/2001 5:41:11 AM Poster : albertl

Hello all wizzards, This is also contribution to the leading indicator discussion. So, we are not supposed to use e.g. 2day % close prediction as input to a second 2day % close prediction. But what about using the actual signal , say of a 2 day prediction as input to a 10day prediction. If using the out of sample signal of the 2 day prediction as input to the 10 day prediction is acceptable, why should the use of the actual signal not be acceptable? albert

p.s: part\_copy of mail to support:> .....4) Is there any possibilty of mistakingly getting out of sample data mixed in my final prediction ( an unacceptable hindsight) by using actual signals of different predictions as inputs to my final prediction...I hope not..I am extremely surprised how the out of sample results ( 1year I use ) can jump to over 140% based on predictions which themselves bring 30% or 50% in out of sample. ( in stocks and even in currencies) ANSWER: The Out of Sample data is not mixed in with the final prediction, but are you feeding in the Actual Signal data stream (ie the blue line)? This line should only be used for visual analysis. Use the green Out of Sample Signal to feed in as an input to another prediction.

### **Re: looking unduely into the future**

Date :8/3/2001 9:20:57 AM Poster : Steve Ward

You can certainly use any prediction of the future as an input to any other prediction of the future as long as you make sure no information known only in the future slips in anywhere. This means in particular that you should:

1. use the out-of-sample net as input
2. make sure your inputs are not known only in the future

For any prediction, you should never feed in the lead indicator as an input. It gives you information you could not know at the time you make a prediction, so it can't be an input.

The actual signal is basically a lead of the output and so it also gives you information only known in the future.

A prediction of the future is made from information NOT known only in the future, so a prediction is ok as an input. It is just a guess at the output, and not the actual output itself.

Is the above clear, or should I rephrase it?

### **Selective Input Periods**

Date :8/7/2001 6:30:14 PM Poster : zhazam

Steve or anyone ... From what I've read on the threads and boards, NNs works well on securities that are in trading ranges. However, not all securities trade in trading ranges all the time. Many securities trade in ranges, trend and then trade in ranges again. Is there a way for me to dummy out the trending part of the market so I just show the NN the trading ranges? I tried to make the trending periods have 0 inputs (for what ever indicator I use) because NeuroShell's input time frame is continuous. I'm not sure if the 0 inputs into the NN will actually give me the desired "don't look at this data point" affect on the NN. A "null" output that would force the NN to ignore the particular time period

(minute, day , month, etc) would probably be more appropriate. Thanks in advance

### **Re: Selective Input Periods**

Date :8/8/2001 1:39:46 PM Poster : webmaster@ward.net The neural nets in the prediction wizard will ignore any bars in which one of the inputs is missing, so this is the NULL you are seeking. Zero doesn't indicate missing, but you can force an indicator to be missing by sending an asterisk to the chart. If you didn't read this, don't worry, it is largely undocumented. For example, suppose you didn't want the net to include Mondays in the training set. Suppose further that you had the RSI as an input to the net. Then change that input to the following Rule indicator (see the Rules category): IF condition=Monday Flag then \* else RSI Now all you have to do is come up with some indicator you can put in the condition to tell you when you are in a trend. Maybe when closes get successively higher or successively lower.

### **Re: Selective Input Periods**

Date :8/9/2001 12:22:56 AM Poster : Zhazam Thanks webmaster ... I tried it and it works. Now, within the same context, how would I specifying specific date ranges (i.e. dd/mm/yy). Are there any date functions that allow dates to be specified ... above and beyond the general ones provided? Thanks! On 8/8/01 1:39:46 PM webmaster@ward.net wrote: The neural nets in the prediction wizard will ignore any bars in which one of the inputs is missing, so this is the NULL you are seeking. Zero doesn't indicate missing, but you can force an indicator to be missing by sending an asterisk to the chart. If you didn't read this, don't worry, it is largely undocumented. For example, suppose you didn't want the net to include Mondays in the training set. Suppose further that you had the RSI as an input to the net. Then change that input to the following Rule indicator (see the Rules category): IF condition=Monday Flag then \* else RSI Now all you have to do is come up with some indicator you can put in the condition to tell you when you are in a trend. Maybe when closes get successively higher or successively lower.

### **Re: Selective Input Periods**

Date :8/9/2001 9:01:25 AM Poster : Webmaster@ward.net

If you have the DayTrader, you can select time ranges, but not date ranges. However, you can read those asterisks in via a text file as Other Instrument Data, for example, or even in one with the same name as the stock, e.g. DELL.CSV. Below is the first few lines of one we made for Dell, with a new indicator called Trending that would be missing when we wanted to show a trend. We just made it zero otherwise, but of course it could be anything.

```
Date,Trending 1/1/2001,0 1/2/2001,0 1/3/2001,0 1/4/2001,* 1/5/2001,* 1/6/2001,*
1/7/2001,* 1/8/2001,* 1/9/2001,* 1/10/2001,* 1/11/2001,* 1/12/2001,* 1/13/2001,*
1/14/2001,* 1/15/2001,0 1/16/2001,0 1/17/2001,0 1/18/2001,0 1/19/2001,0
1/20/2001,0
```

### **Re: Selective Input Periods**

Date :9/20/2001 3:10:25 PM Poster : webmaster@ward.net There was an error in the post to which this message replies. Actually, the Prediction Wizard will only ignore bars for which ALL inputs are missing. We should have suggested that the output be enclosed in the IF indicator, because the Prediction Wizard will also ignore any bars in which the output is missing. Sorry for the mistake. Note that to enclose the output in IF-THEN you will have to use your own indicator as an output, not allowing the Prediction Wizard to build it for you. E.g. if predicting change in close 3 days ahead, insert a 3 day change in close indicator (momentum). Then predict that 3 days ahead. On 8/8/2001 1:39:46 PM webmaster@ward.net wrote: The neural nets in the prediction wizard will ignore any bars in which one of the inputs is missing, so this is the NULL you are seeking. Zero doesn't indicate missing, but you can force an indicator to be missing by sending an asterisk to the chart. If you didn't read this, don't worry, it is largely undocumented. For example, suppose you didn't want the net to include Mondays in the training set. Suppose further that you had the RSI as an input to the net. Then change that input to the following Rule indicator (see the Rules category): IF condition=Monday Flag then \* else RSI Now all you have to do is come up with some indicator you can put in the condition to tell you when you are in a trend. Maybe when closes get successively higher or successively lower.

### **Re: Selective Input Periods**

Date :10/2/2001 4:59:38 PM Poster : webmaster@ward.net

We now really regret ever trying to tell our users how to do selective training with neural nets. As the tech support Q&A we received below will show, trying to do that sort of thing opens a big nasty can of worms that you will wish you had never opened. The Q&A is just the tip of the iceberg. We can't spend more time doing tech support on this, and we may even delete this thread in the future. Therefore, please take our advice and DON'T try to do the selective training we mentioned in this thread. As our CEO would say: the juice isn't worth the squeeze!

Q. The attached chart is trained on data through 9/28 and the chart shows that. But, the prediction analysis, statistics and the trade by trade stop at 8/24. Can you help with this.

A. The problem where the prediction stops training at 8/24 is a result of how many bars ahead you are predicting. Because you have constrained the output, the number of bars ahead is actually the number of constrained bars ahead and not the actual number of bars ahead. Therefore since you are looking 40 bars ahead, the prediction is actually looking 40 constrained bars ahead, and since you only have 2 bars per day, it is actually looking 20 days ahead. So the prediction can only train up until August because it needs to look 20 days ahead.

The way around this problem is to put the lead into the output before the bars are constrained instead of letting the prediction lead the output. By doing so, the lead will be the number of bars ahead instead of the number of constrained bars ahead. As an example, if you wanted to make one prediction a day and you want to predict the change between 9:30 and 9:00 at 9:00 on a 1 minute bar chart, you would use the following output and set the number of bars ahead to 0 in the prediction wizard:

IfThenElse(Time=9:00, Lead(Change(Close,30),30), \*)

### **spreads and portfolios**

Date :8/12/2001 4:55:14 PM Poster : albertl

Hello, Try this: open a new chart for ATHM ( any small value stock) insert an indicator for the sum of CIEN, BGEN , ATHM (close) If you like, multiply each stock by the the number of your shares. You get a nice chart of your portfolios value. However, if you try to go further you will have a surprise: insert a prediction (correctly done for say % change of the above mentioned sum of your stocks ), for better illustration, insert an indicator of the total of your equity for all trades :: you will notice that the trader is ignoring your sum indicator and is just predicting ATHM. How to do portfolio or spread predictions?

albertl

### **Re: spreads and portfolios**

Date :8/13/2001 1:05:50 PM Poster : Xprogrammer

Albert - can you describe in more detail what you are trying to do? I don't understand a portfolio or spread prediction.

The Xprogrammer

### **Re: spreads and portfolios**

Date :8/15/2001 10:25:21 AM Poster : albertl

Hello Xprog, I cannot imagine my portfolio approach is uncommon. Any equity can be modeled and predicted in principle. 1)Just consider a portfolio ( a sum of distinct stocks or contracts) as an equity on its own rights, assume may be you have two such portfolios and you consider going short on one and long or flat on another. 2)Obviously spreads are well worth predicting to future and currency traders 3)Composing ones own (industry) group index for use in a prediction is also an idea directly related Now a question to Steve Ward: do I need TurboPROP for this, assuming I am to lazy to manipulate the data stream itself ( creating new tickers) Thx albert

### **Re: spreads and portfolios**

Date :8/15/2001 4:54:50 PM Poster : Steve Ward

I did your portfolio test without any problem. I think what you are missing is this: you have to go to the the bottom of the dropdown box where you select what to predict - and select Other Data/Indicators. Find the indicator there that you built. If you select percent change in close, you are predicting the percent change in close of the primary issue in the chart, not your indicator.

I do have a suggestion, though. Don't use the number of shares as a multiplier for the stock. Use the fraction of the shares which that issue represents in your portfolio. For example, if you have 200 shares of CIEN, 200 of BGEN , and 400 of ATHM, then your indicator might be:

$0.25 * CIEN + 0.25 * BGEN + 0.5 * ATHM$

I didn't understand your question about manipulating the data stream itself.

### **Re: spreads and portfolios**

Date :8/16/2001 3:45:20 PM Poster : albertl

Sorry, to insist:

I did do the prediction correctly: I really predicted the change of my freshly designed "PORTFOLIO INDICATOR" which is a (weighted) sum of the different stocks in my portfolio.

I underline, this was NOT the usual % close or any other of the standard choices in the dropdown box like %change of open or close or optimal buy/sell etc of the primary issue as you call it).

So I did use the option OTHER DATA/INDICATORS at the bottom of the drop down box.

Allow me to take the issue back to the beginning:

1) open a new chart, this time say with ARWM, which is a low value stock showing a very distinctive pattern (not present in BGEN or CIEN) this chart ranges roughly between 1 and 4 \$ 2) build and insert the "portfolio indicator" say  $100 \cdot \text{CIEN} + 100 \cdot \text{BGEN}$ , for the purpose of better illustration of my point, (although for prediction  $0.5 \cdot \text{CIEN} + 0.5 \cdot \text{BGEN}$  would be preferable) now there is a second chart on the screen ranging roughly 10,000 to 20,000\$ 3) insert by means of the option "other data/indicators" a prediction of the freshly inserted "portfolio indicator" 10 days in advance ( default)

lets say, to make it simple, use as the only input for this prediction the close of CIEN (on its own) If you train for profit ( training 5 years/ 3month , 1 out of sample 1year ) returns are respectively minus 6 % and minus 38%

now, as the pop up confirms, we have the graph of " trades pred 10 day  $\text{ADD2}(\text{MUL2}(100, \text{BGEN CLOSE}) \text{MUL2}(100, \text{CIEN CLOSE}))$  " inclusive of one crazy buy signal at the beginning of August 2000

BUT THE GRAPH IS THE ONE OF ARWM! You will say the prediction is correct, it is just inserted in the graph of ARWM, "the primary issue in the chart"

4) Insert the indicator "system equity all trades" from the category "trading strategy System information" for trading strategy "trades predicted 10 day  $\text{ADD2}(\text{MUL2}(100, \text{BGEN CLOSE}) \text{MUL2}(100, \text{CIEN CLOSE}))$  "

If the prediction and the trades concern our "portfolio indicator, the equity should range in the 5000 \$ area , as since august 2000 the "portfolio" has dropped from 15,000 \$ to under 10,000\$.

HOWEVER The system equity chart is however showing only between 1 and 2 \$ loss !!!!

The system equity's chart pop up name is though very clearly " SYSTEM EQUITY (trades predicted 10 day  $\text{ADD2}(\text{MUL2}(100, \text{BGEN CLOSE}) \text{MUL2}(100, \text{CIEN CLOSE}))$  ) "

This time we cannot say the graph is the one of the "primary issue" but the prediction is right ( the system equity).

The graphed equity is definitely not the correct one and that is why I still suspect the trades predicted are not correct either, both probably are only related to ARWM "the primary issue" in the chart, and not to what their names ( pop ups) say.

Thanks for yor patience albert!



**Re: spreads and portfolios**

Date :8/16/2001 4:38:14 PM Poster : Steve Ward

If I'm understanding you correctly, and I think I am, you can certainly predict that indicator, and the prediction signal will be for the indicator. However, you cannot trade it as though it were a stock itself. The Trader always assumes you are trading the primary issue in the chart, and that is why the trading and system equity is for the primary issue in the chart. The Trader is making trades for you on ARWM based upon whether the prediction of your indicator is above or below some threshold. The fact that it says "Trades: pred 10 day ADD2..." is just the name of the trading strategy, so named because it uses your indicator (pred 10 day ADD2 etc.) to make the trades. However, if you want the predicted value of the indicator, you have it. To verify that it is correct, predict 0 days ahead and feed in as inputs CIEN and BGEN. The neural net will discover the coefficients in your formula and get the prediction 100% right.

**Re: spreads and portfolios**

Date :8/17/2001 9:45:30 AM Poster : chris wong

albert i just use adaptive turboprop 2 and which looks just like an indicator - so there's no issue of trades i just get a prediction. but if you want trading signals for these combination portfolios you are building you can build a text file for them and give them your own ticker symbol. you can put open high low etc in the text file. then they'll be the primary issue in the chart

**Re: spreads and portfolios**

Date :8/17/2001 10:45:10 AM Poster : Xprogrammer

He maybe could do what you said Chris, but I'm wondering why he would want to? For portfolio management I use Genehunter as I was advised some time ago by wardsystems. Also take a look at the post by Steve Ward back in 2000 called Portfolio Optimization. What you want to do, it seems to me, is buy and sell components of the portfolio so that the whole thing is optimized for profit and maybe minimized for risk. Genehunter has an example of that, but there are also lots of other optimization schemes that can be done in Genehunter. Now I used to be a programmer so I don't have any problem using the Excel formulas and such, because GeneHunter requires programming-like talent to make all those formulas. So I'd make sure I was comfortable with using Excel formulas before I sat down with Genehunter, but I don't really think you actually need to be a programmer.

The Xprogrammer

**Re: spreads and portfolios**

Date :8/19/2001 12:10:30 PM Poster : alberl

Hello Xprog,

There are many reason to do what he is doing...

1)Yes the aim is also risk reduction. Take delta neutral trading as an example. 2)Any option trader would need it (straddle,butterfly...). I am not a specialist here 3)trading against the market is suicide, and using a strategy in NS where you cannot put a Nasdaq buy or sell signal as one of the entry or exit conditions directly in the strategy itself is really pity. 4)I am trading from Europe. I should calculate my US portfolio in Euro currency the way I explained... In order to take the exit door when it

is time, and switch if necessary to an european portfolio 5) I start currency trading, two contracts in different currencies (= one single and may be smaller risk), they should be traded together... Any other idea where the approach is useful or even necessary...?...sure But any suggestion how to get the NS trader nevertheless do it is highly appreciated. albert

**Re: spreads and portfolios**

Date :8/20/2001 10:28:33 AM Poster : chris wong

buy sell signals for the nasdaq strategy are generated by rules. why not just put those same rules for nasdaq into the strategy for your stock?

**Re: spreads and portfolios**

Date :8/21/2001 10:08:54 AM Poster : albert stoffel

Hi Chris,

May be...thanks for the suggestion, although it would be a pity to use simple rules and not neural signals, we all are neural net fans, I believe, Metastock is belonging to the past isnt it? It would be much nicer to use NS's possibilities. Setting up predictive trade signals ourselves would be a better solution, what leads me to the question :how the trading signals are reached within the prediction wizzard, say for optimal buy/sell? Are they neural NET OUTPUTS or are they outputs of normal trading strategy rules fed with net signals (predictions)? Has anybody managed predicting trade signals of similar quality to the inbuilt ones ? albert!

**Re: spreads and portfolios**

Date :8/21/2001 1:18:18 PM Poster : chris wong

albert the neural net signals are called out-of-sample signal. you can use them in rules like if then and  $a > b$ . i do that all the time. according to your other posts the trading signals from the prediction wizard aren't going to help you much since they are from the primary issue in the chart which was already discussed by you and steve ward. but they're there too called pred > long entry threshold etc. if you insert existing data and calcs you'll see all these things.

**Re: spreads and portfolios**

Date :8/25/2001 1:15:25 PM Poster : albert!

Hello Chris,

I understand you like to set up trading strategies yourself, not using the inbuilt trade signals of the Prediction Wizzard, and based on thresholds of out of sample signals.Can you give me any idea of the degree of sophistication you go into? You recommend also I should simply set up a trading strategy based on thresholds of out of sample signals of my indicator , say of a spread , of a sum or even a ratio of two exchange rates. Are you happy with the test results of your "manually set up "strategies? I have looked for example at the result of the trading strategies "standard deviation and ATR bands" for the Swiss Franc. I would call these two strategies non neural or classical. The test results are, without optimization ( I use the simple trader) strictly unsatisfactory. But if I put some of the elements used for calculation of the bands as well as the trading strategies long entry order signals as inputs to a simple prediction ( optimal % change open 10 days) of the prediction wizzard, I get satisfactory results already.. This seems to prove to me that setting up a non neural

(classical )strategy will need an effort of a much higher degree of difficulty and I even doubt the predictive quality will reach that of a neural prediction of trade signals, which I assume is done in the prediction wizzard. That is also the reason why I would like to have more details about the Prediction Wizzard's inbuilt trading signals, especially if they are neural signals . albertl

**Re: spreads and portfolios**

Date :8/28/2001 1:20:38 PM Poster : chris wong

albert the strategies the prediction wizard builds are just threshold rules like if prediction > x then buy. so if you want to build similar rules in the trading strategy it is very simple. if you do that your nets don't have to be on the primary issue, even though your trading strategy is. i dont usually build more complex neural net rules but i like to combine several rules into one strategy - to me thats the power of nstp. like buying when two nets are up or when one net and an indicator are up. lately i've been using the neural indicators and cluster addons because they don't learn to predict anything - they just learn to give a signal unrelated to predicting anything. hope this helps.

**Re: spreads and portfolios**

Date :8/19/2001 11:42:46 AM Poster : albertl

hello Chris,

Thanks for your suggestion. I understand that also with turboprop2 one can not get trades on a "spread, index or portfolio indicator", but only on the "primary issue in the chart". Yes Chris, exporting everyday the open,high,low,close and may be volume of this "custom portfolio indicator" or better called "custom data" is a solution. One must though,each time, insert manually the exact wordings "open,high,low,close and may be volume " in replacement of those titles NS is putting automatically . However, I will sooner or later upgrade to intraday, and I should have these trade signals at my disposal in real time. albert

## **2 Questions and 2 suggestions**

Date :8/20/2001 6:35:44 AM Poster : Andrew

Hi all,

I use a NST Pro around half a year already and have couple questions and suggestions to share.

My questions: 1) I extensively use nice feature to write custom indicators via DLL library. Unfortunately there is a limited documentation about interface features NSTP supports. It looks for me that NS assume C style for calling program because once I tried dll compiled with C++ language then custom indicator returns messy program name. Does anybody use C++ to write dll for custom indicator? How should it be declared? Is it valid to use something like `extern "C" __declspec(dllexport) .....` 2) I have suspicious that Neuro Shell Trader was written in Visual Basic. Am I right? Probably it explains the bad performance once I simultaneously load several stocks for analysis.

I hope NST developer might consider these ones: 1) I've noticed that the one of most frequently used preprocessors for NN is a logarithm of price. I would suggest to implement the feature to display the price action in logarithmic scale (simple isn't it?) or consider treatment of  $\ln(\text{price})$  as a normal price then user can use candlesticks of  $\ln(\text{price})$  2) Before the day-open I use something similar to "What-If" analysis. I enter fictitious price range for the next trading day and play several scenarios to find out predicted buy/sell signal from the possible price range. This way I build a plan and strategy for my next day. I would suggest to automate this function somehow or, at minimum, to include "Refresh" button so NST could re-read updated price value from my ASCII file.

All constructive remarks are welcomed Regards Andrew

## **Re: 2 Questions and 2 suggestions**

Date :8/20/2001 10:21:48 AM Poster : Webmaster@ward.net

The dialog boxes and the outer interface are in the compiled form of Visual Basic. All CPU intensive facilities are in C: indicators, neural nets, charts, genetic algorithm, add-ons. It is important to remember that NST loads everything into memory, and if you have nets with several walk-forwards, or other complex models, your RAM can get eaten up quickly. There are some very large data structures that complex models require, and neural nets in particular require a huge amount of data. If you loaded a bunch of stocks with very simple indicators, you shouldn't see much of a problem, so you have to realize that power requires resources. Our web site now lists a 400MHz Pentium with 64 Megs RAM as the MINIMUM computer NST will run on.

However, the most important thing you can do to keep performance high is not to display much data on the chart, even if you have loaded quite a bit of data. Usually, people display far more than they actually need to see. You adjust this on the Format Chart menu.

## **Notice about performance**

Date :8/21/2001 5:54:02 AM Poster : Andrew

I would like to clarify my notice of performance issues for NST.

In tuning of any system it is important to identify and tune the system bottleneck.

Simply speaking let's assume that computer consists from 3 components: hard drive (I/O subsystem), memory and CPU. Any performance-tuning book describes that memory might impact CPU performance through the high level of swapping or paging. I did testing of NST for my PIII 512Hz, 256Mb RAM, 512Mb swap file system on 30Gb 7200rpm hard drive computer. I prepare NST chart with trained networks for 20 stocks for 5 years track of each and monitor computer during simple operation of JUST opening and closing chart in NST. Results: I/O activity was close to zero, swapping was absent, paging was very close to zero but CPU was equal to 100% utilization during 20 minutes of some weird activity. Because NST did not do anything useful during this operation (network was already pre-trained) then I conclude that all CPU was wasted on the chart initialization process. Memory and hard drive of computer are not the bottleneck. The real bottleneck is a CPU may be due to inefficient algorithms of memory allocation or chart initialization which are probably done via Visual Basic.

I hope Ward Systems will review these algorithms some days.

**Re: Notice about performance**

Date :8/21/2001 10:59:02 AM Poster : webmaster@ward.net

Our programmers strongly disagree with the statement that NST does nothing useful during chart loading. Twenty stocks w/ nets all have to be loaded with data and all of the indicators calculated, then all of the prediction values calculated, then all of the prediction trading points calculated, then all of the the trading statistics as well. Remember, if you have 5 walk forwards, there are 6 neural nets in each stock, and neural nets can be quite large, not to mention all the support structures required for the complex interactions. Any of the indicators that reference Trading Strategy take much longer, because they are somewhat recursive (see the tip called "When optimization is really slow".)

Nevertheless, if your chart takes 20 minutes to load, we think something is definitely wrong, unless you have an awful lot of nets, indicators, etc. Make sure you have deleted old nets, indicators, and strategies that you no longer need but which may be hidden. If it still takes 20 minutes, please send your chart to support@wardsystems.com so we can investigate this. Any performance problems need to be investigated in the context of the chart causing them.

**Re: Notice about performance**

Date :8/30/2001 4:40:25 PM Poster : Andrew

Dear Webmaster,

Thank you for your advice. Indeed I had a chart in "development" status with lots of different indicators which I used to experiment with NN model and I just simply added 19 more stocks to see how it works - in result I got a bad performance. After I cut almost everything and left 3 indicators as price, actual and predicted signal then NN performance improved significantly. From now on I am using "simplified" version of NN in production status.

BTW: It is not an easy staff to start using NeroShell correctly because it requires

at least minimal understanding what is a statistical science of time series predictions but it gives very valuable support in rough times – I like it.

### **Voting of experts and signals**

Date :8/29/2001 1:23:12 PM Poster : albertl Hello Chris, Hello friends, I also like to join several predictions and have the trading strategy wizzard vote on them.. I believe it is reasonable, and that is what you are doing, to put only one non neural signal (classical indicator threshold) to vote with a majority of neural signals ( threshold of out of sample signals). I assume also you would have optimized that classical indicator. What surprises me nicely with NST is that voting really works and improves the return%.. I have very bad memories of a classical non neural trading program which uses optimization, forward testing and voting of technical indicators. The voted signals there are unacceptable although the manufacturer is very proud of his product. He claims over 50% hit rate, but I could not make out any significance at all in his end of day signals. When putting a group of experts to vote , each expert taken on its own should have sufficient knowledge, meaning a hit rate of say at least 65%. I do not see classical indicators having this performance on a regular basis, I see may be 55% to 60%, only exceptionnaly up to 70% Idiots cannot get cleverer if they vote.in a group.. What is the probability of a group of five experts each being right 50% on its own and when they vote, say unanimously.? Over 50% or less ? I suspect less . How right each expert has to be (probability X%) , if the result of the vote must be more than say 70% correct (probability Y % ) ? Should we guess X% --> Y% : 50% --> 40% , 60% --> 65% , 70% --> 70% Has anybody precise knowledge about such probabilities? What about optimization in this context? albertl

### **Re: Voting of experts and signals**

Date :9/4/2001 9:02:27 AM Poster : Texas Bubba Idiots cannot get cleverer if they vote in a group is maybe one phrase, but two heads is better than one is another. Maybe your TV doesn't show "Who wants to be a millionaire" where you live, but they have these "lifelines" where if the smart guy in the hotseat gets stumped, he asks the studio audience to vote on what they think the answer is. There is always a spread of votes across the 4 possible answers, but the right answer has the highest number of votes most of the time when I've watched it. I don't think the folks in the audience are any smarter than the dude that wants to be the millionaire, but their experiences cover different areas. Now I can't exactly answer your question because I got a D in statistics, but you call me if you want to know about riding horses and ranching.

### **Re: Voting of experts and signals**

Date :9/21/2001 4:52:16 PM Poster : safigan Statistically speaking, you should get better results from a majority of experts if each individual expert produces a positive result. If you assume that the average gain is equal to the average loss, then any expert who's right more than 50% produces a positive result.

Correlation between the experts becomes is a big issue. For instance, if the experts always agree (correlation = 1), then using a majority of experts is the same as using one expert. If two experts always disagree (correlation = -1), then their votes always cancel each other out. If each expert is truly independent (correlation = 0), then optimum results are achieved. Correlation would exist if you use correlated (or even the same) inputs for more than one expert.

We can explore a simple example. Let's assume no correlation and two experts. The experts must agree before action is taken. If both expert are correct 60

percent of the time, then together they are correct  $1 - (1 - .6)(1 - .6) = 84$  percent of the time. Note that correlation almost always exists, so actual results are likely to be much closer (but still higher than) 60 percent.

**Re: Voting of experts and signals**

Date :9/24/2001 3:33:43 PM Poster : albertl Hello Saffigan,

Thanks for your your contribution, I was indeed hoping for such a statistical/probabilistic comment. I have some difficulties though admitting , as this formula suggests, that two "30% experts" ( "independant i.e. zero correlated idiots") would be blessed with being right 50% !  $1 - (1 - 30\%)(1 - 30\%) = 1 - 49\% = 51\%$  On the other hand this might explain why democracy works relatively well...

Assuming a moving average is 60% right, another indicator say RSI 70% and a 3rd one say CCI 50%, could we hope being right , ignoring corelation, say  $1 - (1 - 70\%)(1 - 60\%)(1 - 50\%) = 1 - 0.3 \times 0.4 \times 0.5 = 94\%$  ...very unrealistic.. if all three agree ? How much to estimate correlation between classical indicators? What about two out of three experts agreeing.?

One of these days I might dig out some books to get rid of this funny feeling that 50% should appear somewhere in the formula...my stomach cannot digest that three times 50% would yield more than 50%... albertl

**Re: Voting of experts and signals**

Date :9/29/2001 4:43:54 PM Poster : Sylvain Gauthier

It does not explain at all how to combine the experts and how to gently switch from one expert or combination to another. Notice that the optimal set of indicators will change through time but at one point to and how do you give more weight to one expert. Using a network of network does not work, try it.

**Re: Voting of experts and signals**

Date :9/30/2001 2:41:00 PM Poster : albertl

Bonjour Sylvain,

One very simple way to give one expert ( the best of the predictions ) relatively more weight is to put the corresponding trading condition, say the long entry condition, twice in the trading strategy. This is definitely working. . Obviously one could also try other less direct ways of voting, but the discussion I started was really mainly about the statistical background.

I believe Ward Systems has described two further ways of combining (combining is not really voting) signals, you might want to review the examples, I believe they call it averaging of the signals. Review the examples.

Regarding the variation though time , this is probably absolutely normal in the prediction business. What time`frame ? I have heard about people changing their models evry week and guess this might not even be sufficeint in present times. Maybe some more experienced friends might comment.

albert

**Re: Voting of experts and signals**

Date :10/9/2001 2:18:29 PM Poster : albertl



Hello All, I would like to stress that any number of 50% experts will never obtain more than 50% probability of being right, even if voting !!! Lets consider three 50% experts voting unanimously , they have  $0.5 \times 0.5 \times 0.5 = 1/8$  probability of being right BUT they have the same  $1/8$  probability to be unanimously wrong !!!  $1/8$  right versus  $1/8$  wrong means fifty fifty >>>> 50% is the probability to reach better results by voting than 50% we need experts better than 50% albert

**Re: Voting of experts and signals**

Date :6/7/2002 2:24:42 AM Poster : Nalin Pasricha

Albert,

Can u tell me where these two examples of combining expert predictions are. I've checked Help and the Examples section of the web site and couldn't find them.

### **Multiple lots**

Date :9/1/2001 4:02:21 PM Poster : Jana

I'm sorry for too basic question, but I was wondering if there is possibility to program multiple contract with NeuroshellTrader Professional. Like if I want open a position and then keep adding to it or if I want take partial profits at some point. I would appreciate any suggestions.

### **Re: Multiple lots**

Date :9/4/2001 8:45:56 AM Poster : Webmaster@ward.net

We have something similar but not exactly what you want. There is an option to purchase as many share as your account balance can support. As the price goes down or your profits go up, you will be automatically purchasing more shares. However, there is no mechanism for you to intervene with partial trading in the trading strategy once it gets started.

### **Re: Multiple lots**

Date :9/4/2001 8:33:07 PM Poster : Jana

Ok, I see. However, there is any reason why this is done this way? I would imagine everybody is using multiple lot systems, also I don't see why it would be difficult to program it. All you would have to add is the feature allowing to buy while already long and allowing close partial positions. Right now after I test some strategy with one lot using Neuroshell Trader I have to write my own routine to backtest it with multiple lots -wastes a lot of time for sure. Any comments how everybody else is solving this problem would be highly appreciated.

### **Re: Multiple lots**

Date :9/5/2001 9:14:23 AM Poster : Texas Bubba

Jana, forgive my stupid questions, because I'm just a country boy trying to learn. How would such a partial thing like that work during backtesting? I mean, how would you tell it what to do during optimization or what kind of interface would Ward have to put in to do that? Then if you're in the daytrader and tooling right along, how would you break in and tell it to sell some? Right now, the daytrader gives out the signals – how would the interface change to allow you to give the signal instead, and a partial lot at that? I'm the first to admit I ain't no programmer, but I'm having trouble visualizing how such a feature would fit logically in with the interface there now what tells you what to do and when to do it, and all of a sudden we'd be telling IT what to do and when to do it?

### **Re: Multiple lots**

Date :9/5/2001 9:49:14 AM Poster : Jana

Everything is very simple indeed. Let say you have condition and tell the Trader to open buy certain number of lots (or sell). All Trader has to do is to keep track of your positions and profit/loss. Right now if I have some condition met to buy, it won't buy anything if I have long position open (which is logical assuming you only have long or short position and size never changes).

Here is an example:

Lets assume my conditions are:

1) buy 1 lot at price level 1 (100) 2) buy 1 lot at price level 2 (120) 3) sell 1 lot at price level 3 (150) 4) sell 1 lot at price level 4 (180)

With Trader right now, assuming price goes from 90 to 200 it will open a position at 100 and will close it at 150 (assuming you use long exit). Of course you can close your long at 180 but that's not the point.

What I suggest happening is open 1 lot at 100 add another one at 120 (keep track of lots which is 2 and averaged open price which is 110), then close one lot at 150 getting back to 1 lot at 110 open price plus 40 points of realised profit for second lot.

It makes no difference to the system if the first lot opens or not - all it has to do is to determine if certain conditions are met and buy/sell specified number of lots and keep track of averaged open price + number of lots.

As far as optimization is concerned, the system behaves exactly similar to what it does now, no modification is required.

Certainly it can be done (Omega TS is one example of it), also it's very easy. Even if it wouldn't be that easy I would be begging developers for adding it since it's vital for any real world trading system.

**Re: Multiple lots**

Date :9/6/2001 8:43:12 AM Poster : Texas Bubba

Now remember, I'm just learning, so it isn't as simple for me. It seems like what you are suggesting is that the same long entry rules we use now can be used for the second lot, and the third, and so on. I don't know about your rules, but mine would keep firing for a while once they start if it wasn't waiting for an exit rule to calm the herd down a little. I mean, I'd be into the second lot on the second bar, and the third lot on the third bar. I use rules like  $RSI < x$ . Once it goes over  $x$  it stays there a while, so you need something like  $RSI > x$  to exit or sell short, right? Neural nets seem to be like this too. So it seems like there'd either have to be some waiting period, or we'd have to put in several more sets of different rules for the other lots, like a different set for each lot, and you'd have to make sure the second set didn't fire right away after the first set. Like the second lot would have to be  $RSI > x+10$ , and the third lot is  $RSI > x+20$  or something. Am I playing with a full deck here?

**Re: Multiple lots**

Date :9/6/2001 11:51:26 PM Poster : Jana  
Texas Bubba:

I understand your question but what you're asking is in fact a bit different question. You're asking about the rules (how to make them, etc.), while my point was to be allowed to use multiple lot feature should you want to. In other words it's up to you - you can always trade 1 lot system, but right now multiple lot system traders don't have a straight solution.

Anyway, answering your question - the simplest way around your problem with  $RSI < x$  example would be to add another rule

something like open another lot only if you are not long already.  
I'm sure you can think of multiple variations of it now, but the example with RSI which comes to my mind would be the following:

1) if you're not long yet - open 1 lot long when  $RSI < 20$  2) if you're not 2 lots long yet - open 1 lot if  $RSI < 10$

I'm not discussing the logic behind this example from trading stand point, but general idea would be you don't want to miss the trade so you go long as soon as RSI goes below 20 (without waiting for 10 which may or may not to happen), and then add another lot if it reaches 10. Hope this helps.

### **Status Flags**

Date :9/25/2001 4:10:40 PM Poster : Mike Oldroyd In a number of situations, I keep finding myself wanting to set flags or variables, that can then be referred to as parameters for other indicators. An example would be, I would like to generate an alert to close a long position, only if I am in a long position (ie the last open long position alert was more recent than the last close long position alert). Another example would be where I would like to trade on a number of crossover signals that happen close together, but not at exactly the same time. With some kind of status flag, I produce an indicator along the lines of "1 if crossabove in the last x bars else 0". I realise that there could be other ways round both these examples, but being able to set some kind of status flag would seem to me the simplest way for these and many other situations. Am I thinking about this completely the wrong way? Has anyone else found a way of doing this? Any help much appreciated

### **Re: Status Flags**

Date :9/27/2001 1:48:40 PM Poster : webmaster@ward.net We can't show you how to set status flags, because there aren't any in the Indicator Wizard. Some background on the Indicator Wizard may explain why: When we built the Indicator Wizard we assumed, based on the TradeStation Easy Language model, that people wanting to do programming-like tasks (flags, iteration, etc.) would go to a programming language. We may have been incorrect in this assumption, but anyway we decided to provide standard programming language interfaces instead of our own language (hence the ability to use DLLs in the Trader Pro in C, Basic, and Delphi). Several advisors we had at the time told us that people would feel more comfortable not having to learn a new, non-standard programming language like Easy Language. These advisors may have been wrong, because we've found many non-programmers willing to use Easy Language because they are scared of "real" programming in something like Basic, even though it has always been our opinion that Easy Language is about as hard as making a C DLL. However, you are right that there are other ways to do these things, which we can show you: To generate an alert to close a long position, only if I am in a long position (i.e. the last open long position alert was more recent than the last close long position alert): `AND ( YourExitCondition, A=B( Position( TradingStrategy, 0 ), 1 ) )` To determine if a crossabove has occurred in the last x bars: `A=B( Max ( CrossAbove( YourTimeSeries#1, YourTimeSeries#2 ), x ), 1 )` Combine a series of the above in AND statements to see if a number of crossover signals happened close together.

### **Re: Status Flags**

Date :9/27/2001 4:53:03 PM Poster : Xprogrammer Well, I for one do appreciate the ability to use a standard language in NSTP. I feel if I have to learn a language for NSTP, I'm better off learning one I can use somewhere else besides NSTP or Tradestation. As a matter of fact, flags and iteration IS programming!  
The X programmer

### **Re: Status Flags**

Date :9/28/2001 3:44:03 AM Poster : Mike Oldroyd Thanks for this. I will have a look

at powerbasic. I was particularly interested about your use of a Max function in the example you give. In my version (Daytrader Pro 3.3) I have Max2, Max3 and Max4 but not a Max function like the one you describe. Can I get download this function from somewhere? I could see now this function could be useful in lots of ways. Mike

**Re: Status Flags**

Date :9/28/2001 1:57:22 PM Poster : webmaster@ward.net Sorry, we should have been more precise. Here it is again without the shorthand: A=B( Maximum Value ( Crossover Above( YourTimeSeries#1, YourTimeSeries#2 ), x ), 1 ) Maximum Value is in the Basic category. Crossover Above is in Crossover and Breakout Identification category.

**parameters increment**

Date :10/5/2001 3:30:35 AM Poster : Claude

Hello everyone,

When I use parameters in prediction or strategies, I sometimes need the kind of parameter which increase 1 at a time. Ex: 1 / 2 / 3 / 4 and I don't mind about 1.1 / 1.2 / 1.3 etc... Is there a possibility to modify the increment? Otherwise it lose time for nothing.

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**Re: parameters increment**

Date :10/5/2001 3:31:54 PM Poster : webmaster@ward.net

The indicators which have integer parameters already take only integer values when optimized, like all the "periods" parameters. So for these, the GA is only examining integer values. For the others, be advised that GAs don't search sequentially increment by increment. They jump all around in the search space, and in fact are searching several places at once. They know nothing of increments. Furthermore, our genetic algorithms are designed to stop searching after a reasonable amount of time passes in which no progress has been made. Therefore, non-integer value searching will only take more time if better results are being found because of searching between integers.

**Re: parameters increment**

Date :10/7/2001 5:23:09 AM Poster : Claude

Great! This is clear now and this can help me to understand what happens inside even if I should not mind.

Thanks a lot, Claude

### **Trailing Stops and Long/Short Exits**

Date :10/5/2001 7:22:05 PM Poster : Jana It looks like I've encountered another \*major\* problem with the way NS Trader handles system backtesting. If I have any trailing or short/long exit stops set they seem to cancel long/short entries. For example: if I'm long at 100 and I have trailing stop set 1 point below, price goes to 102 where short signal is issued, it won't work. As soon as take out trailing stop, short entry at 102 will work just fine. The exactly same situation happens with using long exit stop in similar situation (it cancels all short entries). There is anything I should be aware of? Or logic behind is your trailing stop or long exit stop should be hit before your short entries will become active? I'd really appreciate any insight here.

### **Re: Trailing Stops and Long/Short Exits**

Date :10/9/2001 1:26:39 PM Poster : webmaster@ward.net Normally exits override trailing stops. It sounds like you are doing a reversal strategy and you want the entry reversal to override the stop. You are correct that the trailing stop overrides the reversal entry as the default. You can accomplish what you want and we will be posting a tip in the Tips and Techniques section today or tomorrow describing how that can be done. Hopefully without sounding defensive though, we would like to disagree with the characterization of such a default as a \*major\* problem. Many users like the default as it is.

Take for example a trading strategy where you are entering using a technical indicator which occurs quite frequently, but you want to let your profits run using a trailing stop. If the reversal overrode the trailing stop, you would be unable to let your profits run using the trailing stop.

### **Re: Trailing Stops and Long/Short Exits**

Date :10/9/2001 7:17:55 PM Poster : Jana

Thank you for your replay. Providing one can do the modeling I've described - I don't have any problems to go one extra step. I didn't want to sound rude or anything and I used word "major" only to point out the fact that one \*has\* to be able to do modeling described and I was not sure if that's the case. But I definitely appreciated your prompt attention.

### **Re: Trailing Stops and Long/Short Exits**

Date :10/10/2001 9:12:47 AM Poster : Cantley The Trader Tip actually makes a good point for something I requested in an email a couple of years ago (when you discuss the difficulty of having the Long Exit and Short Entry rules be the same). You folks said you'd take a look at adding it someday; I wonder if you're still considering it. It'd be nice to have another "mode" that the optimizer can work in. Rather than optimizing every number that appears in every rule, let me define 2 or 3 variables, and let the GA work on them. I can use those 2 or 3 variables in my rules/indicators/networks, still let the optimizer work, and significantly cut down on my degrees of freedom. Doable? Best, Steve

### **Re: Trailing Stops and Long/Short Exits**

Date :10/11/2001 1:21:46 PM Poster : webmaster@ward.net Your suggestion is often made and we like the idea because although you can now selectively choose



what variables to optimize, it requires that you set variables you don't want optimized to a zero range, like 4 to 4. Your idea would make the process easier, although it would arguably not help with the issue at hand, because if you didn't optimize the parameters of entry and exit rules there would probably be little need to optimize at all. Remember the issue in the tip is that optimization will likely result in the same rules becoming different.

We have received many, many good suggestions over the last year or two. Right now our development assets are dedicated to providing alternatives to Quote.com, which accounts for the vast majority of complaints and suggestions we receive. In that regard, we hope to have progress very, very soon. Readers of this site will get our announcements first.

**Re: Trailing Stops and Long/Short Exits**

Date :11/20/2001 9:11:57 AM Poster : maciej Yes, I'd agree with that. Unfortunately I can't see the logic. We need Steve to enlighten us.

**Re: Trailing Stops and Long/Short Exits**

Date :11/20/2001 11:45:32 AM Poster : Steve Ward As the webmaster promised in the 10/9/01 reply to Jana, a complete tip was posted on this site explaining the logic. It is called "Reversal Trading Strategies" dated also 10/9/01. There were also two other tips on the complicated subject of stops posted 10/16/01 which you might want to read as well.

### **Currency predictions**

Date :10/9/2001 2:30:52 PM Poster : albertl

Hello all, Can anybody be so kind and give me any example/hint what indicators to use for currency predictions, both daily and intraday. I am presently using daily and intraday bars in my daily NStrader.

Can anybody recommend a specific add on (WARD,JURIK ?) which is definitely improving the predictions. My best results on minute bars have been till now with adaptive MA s., and MESA to a lesser extent., I do not have much success with momentum models. Thanks in advance albert

ps I have been told by support to submit this to the forum

### **Re: Currency predictions**

Date :10/17/2001 9:10:28 AM Poster : Maxwell Craven

I own all but one or two Ward addon programs and have found they often improved all types of trading systems I have built, but I haven't attempted currencies yet. My favorite is the clustering addon.

### **Re: Currency predictions**

Date :10/17/2001 9:32:15 AM Poster : Michael Stigall

I think you'll find that the indicators change over time. For stocks, the price-momentum indicators are always a good starting place. I always narrow the inputs down to a few and then try clustering on the group of inputs as entry/exit signals. Recently I had some particular companies began showing up with the MESA indicators also.

The markets change, and a different set of indicators may be called for after a significant economic or legal upheaval. For instance, if Congress changes the laws for market makers or the tax laws change, the market itself will change to compensate.

On average, I tune the networks every 3-6 months to see if the indicators can be improved; more often if the underlying systems begin showing large error rates. On 10/17/2001 9:10:28 AM Maxwell Craven wrote: I own all but one or two Ward addon programs and have found they often improved all types of trading systems I have built, but I haven't attempted currencies yet. My favorite is the clustering addon.

### **Re: Currency predictions**

Date :10/17/2001 5:12:53 PM Poster : albertl Thanks very much for your comments, Maxwell and Michael,

,May be I should try the add ons, starting with the clusters, which might help also with the following:

Before I upgraded to the NSprof I thought I had been doing a lot of test work and had found good systems,...only to notice that optimizing was not less work. I furthermore got a nice chock when I noticed that optimizing , mainly when selecting the best input variables , did not at all bring the same results as those I had found previously. Changing test periods and walkforward length continues to influence most heavily the choice of the systems..

If anybody wants to unleash his add ons on currencies, here the URL giving free forex minute bars , since january 2001 !!! May be some results could kindly find their way to the forum ...?

[http://www.forexite.com/free\\_forex\\_quotes/forex\\_history\\_arhiv.html](http://www.forexite.com/free_forex_quotes/forex_history_arhiv.html)

[http://www.forexite.com/free\\_forex\\_quotes/forex\\_history.html](http://www.forexite.com/free_forex_quotes/forex_history.html)

Friendly greetings from Europe to all albert On 10/17/2001 9:32:15 AM Michael Stigall wrote:

I think you'll find that the indicators change over time. For stocks, the price-momentum indicators are always a good starting place. I always narrow the inputs down to a few and then try clustering on the group of inputs as entry/exit signals. Recently I had some particular companies began showing up with the MESA indicators also. The markets change, and a different set of indicators may be called for after a significant economic or legal upheaval. For instance, if Congress changes the laws for market makers or the tax laws change, the market itself will change to compensate.

On average, I tune the networks every 3-6 months to see if the indicators can be improved; more often if the underlying systems begin showing large error rates.

On 10/17/2001 9:10:28 AM Maxwell Craven wrote: I own all but one or two Ward addon programs and have found they often improved all types of trading systems I have built, but I haven't attempted currencies yet. My favorite is the clustering addon.

**wavelet**

Date :10/12/2001 2:16:15 AM Poster : Sylvain Gauthier

Any success with wavelets ?

NST allows the user to optimize different objective functions but only if the inputs are optimized. What if the inputs are not optimized: we lose that capability.

The optimal target (optimal % change etc...) has not been defined. How is it computed and optimized.

**Re: wavelet**

Date :12/5/2001 3:54:08 AM Poster : Richard Nowak

"A family of wavelets are derived, based on LaGuerre polynomials. While these wavelets are useful for data compression by describing the waveform in terms of LaGuerre Polynomial coefficients, it is shown that they are not useful for trading because the delay factors preclude any predictive capability. If one can generalize, the implication is that all wavelets are not useful for trading." John Ehlers, check his web site: <http://www.mesasoftware.com/pub/index.html>

**Re: wavelet**

Date :12/5/2001 3:44:55 PM Poster : Steve Ward

I have great respect for John Ehlers, and he could be right about LaGuerre polynomials. But with regard to generalizing to other wavelets, here's something for whatever it is worth: at least two of our users have shown me some pretty profitable charts done with the HAAR wavelet that Victor Chu donated to this forum some time ago.

**Re: wavelet**

Date :12/7/2001 11:14:45 PM Poster : Jimmy Raineri

After reading Steve's post I decided to take a look at the HAAR wavelet that Victor Chu donated to the forum a while back. I had played with various wavelets (including MESA) about a year ago, and my results were less than satisfactory.

However, I'll have to second Steve's comments on the HAAR. This thing works like no other wavelet I've tried in the past. Used properly and within reason, the potential to produce profitable charts is huge. It's an awesome tool - and I thank Mr. Chu for taking the time to prepare and provide it to the forum.

On 12/5/2001 3:44:55 PM Steve Ward wrote: I have great respect for John Ehlers, and he could

**Re: wavelet**

Date :12/10/2001 9:56:15 AM Poster : Steve Ward

We also owe thanks to Bruno Voisin who originally brought the wavelet to our attention, and I think even provided the initial coding examples.

**Re: wavelet**

Date :12/10/2001 3:02:40 PM Poster : Daniel P Lyons

Yes I agree, Bruno and Victor have indeed contributed much to this area of discussion particularly from a coding perspective.

Additionally, Professor Ffion Murtagh (as Victor will confirm) has taken this "humble" indicator to a much higher level. For those interested, please review

his material on:

<http://www.multiresolution.com>

For the mathematically inclined there is much to be gained from wavelets...  
regards, Daniel P Lyons

**Re: wavelet**

Date :12/6/2001 11:15:52 AM Poster : Daniel P Lyons In my experience, many problems associated with wavelets involve inadequate ways of handling end effects, i.e. data boundary effects. This is usually related to the selection of some arbitrary frequency as the "ideal" input solution. There are methods available for properly handling the important "boundary properties" at the end of data. Such techniques (in my experience) do allow effective implementation of wavelets as part of a trading strategy and/or as inputs to predictive nets. Like most successful methodologies, however, they are not used in isolation. Daniel P Lyons

**Re: wavelet**

Date :12/6/2001 2:13:28 PM Poster : Steve Ward Indeed, that HAAR wavelet eliminates boundary problems on the right side of the data. On 12/6/2001 11:15:52 AM Daniel P Lyons wrote: In my experience, many problems associated with wavelets involve inadequate ways of handling end effects, i.e. data boundary effects. This is usually related to the selection of some arbitrary frequency as the "ideal" input solution. There are methods available for properly handling the important "boundary properties" at the end of data. Such techniques (in my experience) do allow effective implementation of wavelets as part of a trading strategy and/or as inputs to predictive nets. Like most successful methodologies, however, they are not used in isolation. Daniel P Lyons

**Re: wavelet**

Date :10/12/2001 9:53:38 AM Poster : Xprogrammer

The optimal change definitions are in the help file under Neural Network - Output Discussion. There's a pointer to that in the context sensitive help that shows up if you push the help button at the place where you can select your output. I also found something about them in the Changes in Versions of NeuroShell Trader book under the place called Changes from 3.0 to 3.2.

As a former programmer myself I actually think the Ward group has done a pretty decent job in their context sensitive help. You can pretty well find most things. The other neat thing Ward did is that if you go to the Help menu and select Search for help on..., all you have to do is press on the Find tab and type in the word optimal. Then all the places where optimal appears show up right away in a list.

Back in the old COBOL and FORTRAN days if you didn't find it in the index of a huge manual, you were out of luck. I sure wish we'd had context sensitive help capability back then! It wouldn't have been much good in the days when we used card decks, but later we went to online terminals and we could have used it if IBM had put in in the mainframe operating systems.



**prediction**

Date :11/5/2001 10:28:57 AM Poster : claude

Hi everyone,

Does it means something if I do a prediction like this:

%change of Close on 5 days, 1 day in the future?

Is there too many chances of overfitting? Thanks

**Re: prediction**

Date :11/26/2001 5:01:07 PM Poster : alberl

Bonjour Claude, Your question is not clear to me, I assume you refer to daily bars, do you mean %change in Close predicted 5 days in the future or are you trying something sophisticated with indicators on 5day periods? albert

**Re: prediction**

Date :11/29/2001 2:57:56 AM Poster : claude

Hello Albert,

Sorry, I realise that my question is not so clear. I'd like to make a prediction of 1 bar in the future, the indicator to predict is made of % change in close on 5 bars (not days).

To summarize:

- . Output: Prediction of "1 bar in the future", for an indicator made of "% change in close on 5 bars",
- . Input: Several indicators ( 5 to 20 bars in the past) made of momentum, regression, % change, fuzzy ...
- . Not trading position, look for minimize errors

The mean error I get is between 0.15 and 0.20 which seems to be good, but I am wondering if I am overfitting or not.

Claude

### **Fitness function**

Date :11/13/2001 1:53:31 AM Poster : Jana

Hi, I would imagine this is another suggestion for NS Trader developers. While building neural nets or optimizing something using GA quite often I find myself in situation where I'd like to use my own (customized) fitness function rather than have to choose from the list provided. For example I may want search for parameters to maximize function  $f = \text{net profit} * \text{number of trades} / \text{average trade span}$  (just an example). In my eyes its not just a minor improvement but rather essential feature to have to take full advantage of neural nets and GA. Best of all it should be really easy to implement too, basically you just have allow user to define his/her own fitness functions and I can't think of any reasons why this would hurt anyway. Your feedback would be appreciated. Thanks,  
Jana

### **Re: Fitness function**

Date :11/20/2001 3:14:13 PM Poster : alberl

Hello Jana, I have read your post again and I realized only now that you have touched the subject which is bothering many of us: the far too uncontrollable trade intervals:

Your suggestion will be very useful to optimize / reduce the intervals, so I strongly vote for your suggestion, may be others would join, and WSystems might consider helping faster in this respect.  
albert

### **Re: Fitness function**

Date :11/22/2001 10:40:05 AM Poster : webmaster@ward.net

We certainly share the view that user-created fitness functions are a good idea, as well as being able to constrain optimization for the purpose of adjusting trade intervals and other things. Basically, the fitness would be penalized if it traded too much or too little. Both of these are on our "to do list".

In the mean time, read the tip on this site called "What to Do if Your Optimized Trading Strategy Trades Too Much". There is already an excellent way to penalize fitness for too much trading that seems to work for most users, assuming that trading rules or net inputs being optimized can cooperate. If it doesn't work consider constraining parameters in your indicators, or revisiting what your trading rules do.

### **Re: Fitness function**

Date :11/24/2001 1:58:37 AM Poster : Jana

I truly appreciate the responsiveness and cooperation by developers.

I didn't particularly meant trading intervals, it could be virtually any function one want to optimize, so its more general.

Different issue is being able define variables and use them as parameters for GA optimization - I assume developers are working on this too.

These 2 are definitely the highest priority on my list, the rest could be taken care using dll pretty easely.

I may have few other neat ideas how to improve NS Trader even further, but they are not that simple so I'll hold on them for now.



For now I'm trying to only suggest upgrades which are in my opinion vital for truly \*professional\* trading package.

**clean desktop, order and clear head**

Date :11/26/2001 4:26:54 PM Poster : alberl

Hello , This is a call for help on down to earth practical work organization !

I am submerged by the multitude of my predictions. How should I organize myself now, I am badly suffering from information overflow. Having multiple folders does no more help, has anybody work a nice and practical classifying system which he would be prepared to share ?

I would also need to be able to import predictions from one prediction to the other, via copy and paste , or drag and drop , is this on the to do list by WS ? thx in advance albert

**Re: clean desktop, order and clear head**

Date :11/26/2001 5:12:15 PM Poster : chris wong

you can feed one prediction into another already albert as long as they are in the same chart.

**Re: clean desktop, order and clear head**

Date :11/27/2001 4:50:46 PM Poster : alberl

Hello again, Chris, this is not at all what I mean. I want to patch my best predictions from different charts into one new chart, the way it goes now is very unpractical, one has to keep on typing , printing out , making notes, or open plenty charts and risk out of memory, quite a mess. if the new chart is supposed to be a little bit sophisticated

The other call for help is more of a theoretical one, how to classify the plenty of predictions, from the point of view of profit ? accuracy? if stock ? if commodity ? if index used ? if MA type or/and if momentum used ? etc etc a methodology is needed...etc etc etc

albert

**train up to today and then look back without retraining**

Date :11/26/2001 4:43:10 PM Poster : alberl

Hi again,

Would it not be nice to train and optimize on data, say of the last 6 month , and then to be easily able to look back at any previous period , say of 3 month, in previous past?

with the same net, without the NST trying to retrain? . alberl

**Re: train up to today and then look back without retraining**

Date :11/26/2001 5:13:21 PM Poster : chris wong

what do you mean by "look back"?

**Re: train up to today and then look back without retraining**

Date :11/27/2001 4:41:22 PM Poster : alberl

Hello Chris,

Time to chat again... The NST is actually already providing but in a roundabout way what I would like to have : . using several out of sample tests. What I would really like is this: distinct out of sample periods say one for the 3 first months of 1999, another one for the 3 months starting August 1999 etc..

If I am prepared to train 1 year and have one 6 month out of sample period. Assume this net gives OK results. But I will now run the training till today on the last 12 months , (without "classical" out of sample period, to get my net up to date). Instead of hoping for the best and go from there, I would like to still do some out of sample testing ... YES ::: ( LOOKING AT the out of sample data THRU THE EYES OF MY MOST RECENTLY TRAINED NET )to see how my most recently trained net works on the three months before the recent 1 year training period.or any other previous period) This is in my eyes better than doing it the usual " classical" way , where the out of samole period is the most recent period I believe this would be dynamite on intraday data Worth considering it from the standpoint of patent law ?.. But there are so many ideas around.. I would call this backward out of sample testing alberl On 11/26/2001 5:13:21 PM chris wong wrote: what do you mean by "look back"?

**Re: train up to today and then look back without retraining**

Date :11/28/2001 5:22:41 PM Poster : Ann

Hi Albertl, I just finished the class and I think I learned how you can do what you want. If you simply train a net and then build a Trading Strategy to apply the prediction to specific dates. Use  $A > B$  and  $A < B$  in your trading strategy rules, where A is either the current net or one of your walk forward nets. I don't think you can use the out of sample net, but then you don't need to anyway. You may have to go to options to make sure the current net and walk forward nets show up.

Ann

## **Trading Strategy thoughts**

Date :11/26/2001 7:31:06 PM Poster : Steve Kratochvil

I just made one of my own personal bonehead mistakes that turned into an awesome discovery after I sat and stared at my mistake for about 3 hours. This is what I have to offer all who work hard to hone their trading systems. Ever feel like you cannot get anything to work out right. Try this. Before you go building the Holy Grail of predictions why not get your Trading Strategy locked down tight just as if you had the perfect prediction signal. This way you only need to solve for predictions not both predictions and trading strategy. I have found that I make adjustments to both in an effort to get the total performance up. This often makes the bad prediction look better than it is or the trading strategy never seems to hit dead center even with fine adjustments. This is what I did. Take your FuzzyGA7 and build a fully optimized prediction with it. Now make the classic mistake of using the ActualSignal of the FuzzyGA7 as the input into a Trading Strategy. Presto you have an absolutely perfect signal to develop a perfect Trading Strategy. I was not paying attention to the fact that I was using this non-tradable ActualSignal because I had renamed it FuzzyGA7Signal which is a real bad name for that signal anyway. I went about my business with 186 wins out of 188 trades not realizing my debacle. I fired up my AutoPilot at 7:30am and left it to trade the day away as I was out and about. I was so excited when I came home that I rushed down to see what had happened. Nothing. Not one single trade was executed. I thought what did I do wrong? I checked everything. The DataX had not sent over a signal all day and my AutoPilot was just sitting there ready as ever. I looked and the trade signals were 10mins behind the current bar. I realized that the DataX was getting a 0 on every bar as the Trading Strategy was 10mins behind the input. But the trades being pegged, on the current live data, were perfect. I was stymied. I had perfect trades only 10mins behind the action. Then I figured it out. I had even called Ward Systems to explain my problem. Then after awhile I started to realize that I had the perfect set of rules for my trading style no matter what the prediction. So I ran the same system on other stocks and they too traded perfectly. I was back to elated and smiles. I also could see that I only needed build any prediction to mirror the ActualSignal. This is just a thought about the possibility of eliminating at least the trading strategy variable from your trading system.

### **Trading Strategy improvement**

Date :12/14/2001 1:02:30 AM Poster : Al Martin

What's the possibility of gaining more flexibility on trading strategies. I am thinking particularly about money management. I would like to see the NS Trader equipped with a Fixed Ratio option which would be a great assist to actual trading. Of course I am referring to concepts that are currently popularized by Ryan Jones. In a nutshell the theory states that you can achieve a geometric amount of profit from a viable system by altering the percent of shares purchased based upon your overall capital where each trade is based upon a changeable and dynamic trading bank. If what I have read from Jones and from Murray Ruggiero is correct, than money management is far more powerful in terms of outcome than the trading strategy alone. Indeed I have seen demonstrations where the actual number of winning trades is the same but the earnings can be more than 5 times as much. I recognize that for an initial development of a trading strategy one would be more interested in developing a winning percentage, but when you are ready to actually trade, I would love to see the trader's capabilities enhanced with this ability.

### **Re: Trading Strategy improvement**

Date :12/17/2001 12:40:41 AM Poster : Jana

Hi Al,

While I do agree with the fact NS Trader would benefit from having MM feature(s) included, my personal opinion is there are several \*more essential\* features which we still waiting to materialise. What I mean I could live with running MM using separate software and my focus for NS Trader still remains in developing original system.

Just my humble opinion for whatever its worth.

### **Fuzzy Logic**

Date :12/30/2001 12:14:49 AM Poster : Steve Kratochvil I am really warming up to this. How as anyone been doing with Fuzzy Logic? I have been testing and find that the FuzzyGA indicators are superior to their counterparts. I know that the help file says that it is humanly impossible to set the parameters of the GA but I have been poking at them just the same. I am currently beating FuzzyGA1(Close,2,5,0.05,0.05,0.1,2) up and down left and right. Any ideas will be greatly appreciated. Thanks,  
Steve

### **Re: Fuzzy Logic**

Date :1/2/2002 8:06:33 AM Poster : Webmaster@ward.net You probably mean that you are beating the optimizer out-of-sample (backtest period), where the optimizer does not optimize. If you are indeed beating it in the optimization period, then you just need to optimize again, telling the optimizer to continue where it left off. It should get as good as you are setting parameters for best results in the optimization period.

### **Re: Fuzzy Logic**

Date :1/2/2002 7:19:04 PM Poster : Steve Kratochvil  
Yes indeed, I am manually working the values. I did the optimizations using full optimization and was not getting what I was looking for, but it did spark my imagination as to how I might start working with the indicators. In light of your comment, I am now re-running a FuzzyGA5 prediction with full optimization. To explain why I am heading into the Fuzzy Indicators manually let me start with this. I see the Fuzzy Indicators as being able to determine a shape exactly as I see it on the screen. If I am looking for a particular shape they are perfect. Once I have the shape located I will then check a small panel of experts for mitigating information. I like velocity in this case. As I can use Fuzzy Indicators to identify shapes, the Fuzzy Indicators are like absolute candlestick formations, only more interpretive of the data, similar to a moving average. The Fuzzy Indicators have two great opposing qualities of static shape with smoothed average. This ability has been increasingly more productive at giving solid tradable signals.

Thanks,  
Steve

### **Voting Between Trading Strategies**

Date :1/6/2002 12:03:51 PM Poster : Andy Bower First of all, apologies if I've missed something but I think I've checked the help files and this forum for a solution but without success.

I have a number of (vaguely promising) Trading Strategies, four based solely on indicators and one a net prediction. I want to feed these into a final Trading Strategy so that I can vote on whether to go long or short based on 3 out of 5 of these inputs being long or short at a time. However, the effect when I feed the original TSs into the arbitration TS is not what I'm looking for. What I see is that the final buy and sell signals are based on whether the input strategies triggered signals on the same day. What I want is to say that if three of the five inputs are currently long (or short) then the final output will be a buy (or sell) in that direction. Is there any easy way of doing this. I realize that I can do what I want by feeding the inputs of the original TSs into my final strategy but I'd rather not do this since I'd like to be able to independently test the inputs. TIA

### **Re: Voting Between Trading Strategies**

Date :1/7/2002 8:37:25 AM Poster : chris wong theres an indicator called position i think you could use for this. just put 5 of these indicators in your chart each referring to one of the original 5 ts. then in the arbitration ts for long entry test all 5 to be = 1. if three of the tests are true you go long. for short you test to see if they are -1 and go short if three are true.

### **Re: Voting Between Trading Strategies**

Date :1/8/2002 11:41:53 AM Poster : Steve in California I'm a NSDT newbie and have received great benefit from the postings in this forum. I have a couple questions and some initial thoughts about answers to the questions that I'd like to put to the group. I don't have any empirical data relating to these questions. I'm just looking for a few more ideas about what to try. The questions are these: 1 What are the various ways to organize indicators within and across indicator sets in a hybrid trading strategy? 2 What are "kinds" of indicator sets that make for good rule sets within a hybrid trading strategy? Thoughts about answers to base optimization runs on: 1) Organize indicators within a rule set such that all the indicators in a set have a FOCUS on the same general timeframe. (That is, if there are three rule sets, the first rule set is focused on the smallest timeframe and the second is focused on a larger timeframe (Elder and Kase recommend about 5 times larger) and the third rule set is focused on a timeframe even larger than the second. My initial thought was that this was the best approach 2) My thinking has evolved to a place where it seems as if each rule set could be focused on a specific kind of market indicator concept. For example, set 1 might be the "Trend Rule Set" and consist of 3-5 optimized RedHaar or JMA-MACD indicators and their slopes. Set 2 might be the "intermarket" rule set and be focused on correlations of smoothed oscillators of the focus data with other comparable oscillators for other data series. A 3rd rule set might focus on Support/Resistance oriented indicators.... What do you think about this first question: i.e., How does one structure indicators in Rule Sets? 2 The second question has to do with the kind of Rule Sets that make sense to develop. I've mentioned 3 kinds above (i.e., trend, intermarket, and support/resistance rule sets). Are there others that also make sense? Like a "patterns" rule set? Thoughts? Steve

**Re: Voting Between Trading Strategies**

Date :1/8/2002 11:58:20 PM Poster : Steve Kratochvil We are getting quite a collection of Steve's in this forum. My personal opinion is that Yes patterns are critical to your system. I recommend that you get the Fuzzy Indicators and pattern your other rules like the ones you have mentioned or other indicators. The biggest advantage that I can see using patterns is that they do not lag. They can give you an accurate right hand and now picture of what is going on with clear interpretation of the right edge. Glad to have another Steve. Thanks, Steve

**Re: Voting Between Trading Strategies**

Date :2/6/2002 8:29:13 AM Poster : Steve Kratochvil I don't think the replies that followed are related to what you are trying to do. If you wish to have a vote based on consensus of a number of indicators less than total consensus of all indicators then do this: For each buy or sell indicator give it a 1 if it is signaling else it is a 0. Add the indicator types (buy or sell) together and if they are greater than or equal to your target of consensus then send a signal to buy or sell. Example: If you have 10 buy indicators and wish to execute a trade when 7 are sending a signal to buy then  $A \geq B(\text{Add2}(\text{Add4}(\text{indicator}, \text{indicator}, \text{indicator}, \text{indicator}), \text{Add3}(\text{indicator}, \text{indicator}, \text{indicator}), 7)$  You may need to use the Threshold indicators to maintain the persistence of the signal coming from indicators once they change. Steve



### **Fuzzy Logic**

Date :1/6/2002 11:05:07 PM Poster : Steve Kratochvil I have just completed a very small application that can determine the Fuzzy indicator settings for the Fuzzy indicators in the NSTP. This has also given me some insight into how a Fuzzy indicator with an adaptive Max Change could be built for another set of indicators. How has anyone else been doing with Fuzzy Indicators?

### **Re: Fuzzy Logic**

Date :1/7/2002 8:18:16 AM Poster : chris wong fuzzy works for me well as long as I examine several stocks, because some stocks don't seem to have repeating pattern all the time.

### **Re: Fuzzy Logic**

Date :1/12/2002 12:20:27 PM Poster : Steve Kratochvil So what are some of the commonality patterns that you have discovered among stocks? Thanks, Steve

### **Re: Fuzzy Logic**

Date :1/8/2002 8:10:34 AM Poster : Maxwell Craven I do pretty well with the Fuzzy Logic too and like Chris, I test on quite a few stocks. But I'm curious about what your application does. How does it find the settings?

### **Re: Fuzzy Logic**

Date :1/12/2002 12:25:14 PM Poster : Steve Kratochvil I seem to be having some trouble getting my posts to come up. Here we go again. I have broken the fuzzy pattern angles into percentages of the Max Change and compared them to the actual Max Change. Depending on where the angle falls I give it the corresponding value of 2,1,0,-1,-2. That is the short version. Thanks, Steve

### **Mutual Fund Trader Needing Help**

Date :1/28/2002 7:03:55 PM Poster : Dave I'm new to NeuroShell Trader and needing some help. I'm trying to develop successful Trading Strategies for Mutual Fund Trading. My preference is to have a low number of trades per year (i.e. 1 or 2 per month) and yet need to be able to exceed Buy & Hold returns. My approach so far has been to try to develop some Trading Rules on indexes: Nasdaq, S&P 500, Russ 2000....etc. and then apply these to the mutual funds that would be most closely correlated to the index. Initially I have only used Moving Averages. Has anyone had some success they would be willing to share? Thanks so much. Dave

### **Re: Mutual Fund Trader Needing Help**

Date :2/4/2002 12:48:17 PM Poster : Mike Oldroyd I do something slightly similar in that I trade Exchange Traded Funds. These funds have exchange symbols that you can directly download and model. There are quite a few of these funds, some common ones are QQQ (known as the cubes) - a proxy for the Nasdaq 100 DIA (Diamonds) - a proxy for the Dow Jones Industrial Average SPY - based on the S&P 500 SPY and DIA are usually pretty closely correlated, so you may not want to trade both of these. Any help? Mike

### **Re: Mutual Fund Trader Needing Help**

Date :2/10/2002 8:06:40 AM Poster : Bill VanDyke Dave,

Some of the most profitable models i've been able to build have been those of Mutual Funds. I have used index data..and data from the fund itself..to build models. My only caution is...that when using fund prices....use prices that have been adjusted for dividends or distributions; otherwise you will only be fooling yourself using data that is incorrect and developing models that might not beat a buy&hold strategy in real time. For example, one fund i model...using the fund price data from Yahoo or Microsoft's Money Central....where the fund prices are NOT adjusted for distributions, showed the fund to have a total return of 50% in 1999, when it actually had a return of 75% considering distributions. I use Fasttrack as my source of Fund and other index data as they adjust prices for distributions. They can be found at [www.fasttrack.net](http://www.fasttrack.net) Good luck.

Bill

### **Re: Mutual Fund Trader Needing Help**

Date :2/12/2002 10:53:30 AM Poster : Maxwell Craven

I do see why using prices adjusted for dividends and distributions is necessary for comparing to buy and hold. On the other hand, although I am certainly no expert on this, I have been reluctant to do shorter term trading models with dividend adjusted data out of fear that resulting sudden adjustments in prices will have an unnatural affect on the model. After all, the model inputs won't see these adjustments coming unless you either have some sort of date inputs or you assume that buying somehow correctly anticipates the earnings. The latter seems a little iffy to me, and I'm not sure how to adequately implement the former.

### **Re: Mutual Fund Trader Needing Help**

Date :2/15/2002 5:03:27 PM Poster : Dave Bill, Thanks for the input. Yes, I do use

dividend adjusted data. I've been using AIQ/Track Data and also Monocle Systems data base for Mutual funds, both of which adjust for dividends. I'm interested to know, if you're willing to share, what indicators and parameters you have had the most success with? Dave On 02/10/2002 8:06:40 AM Bill VanDyke wrote: Dave, Some of the most profitable models i've been able to build have been those of Mutual Funds. I have used index data..and data from the fund itself..to build models. My only caution is...that when using fund prices....use prices that have been adjusted for dividends or distributions; otherwise you will only be fooling yourself using data that is incorrect and developing models that might not beat a buy&hold strategy in real time. For example, one fund i model...using the fund price data from Yahoo or Microsoft's Money Central....where the fund prices are NOT adjusted for distributions, showed the fund to have a total return of 50% in 1999, when it actually had a return of 75% considering distributions. I use Fasttrack as my source of Fund and other index data as they adjust prices for distributions. They can be found at [www.fasttrack.net](http://www.fasttrack.net) Good luck. Bill

### **Fuzzy**

Date :2/6/2002 11:10:06 AM Poster : claude Hi everybody, Suppose I am looking for a fuzzy3 that rises sharply then rises then remains steady (so 2, 1, 0). If I say 0.5 is the maximum variation after that it will be "rises sharply". Then what is the change line between remains steady and rises? Is it exactly 0 or something between 0 and 0.25? Thank you, Claude

### **Re: Fuzzy**

Date :2/6/2002 8:21:18 PM Poster : Steve Kratochvil This is what I have done. I first determine the slope of the line as positive or negative. I then determine the total distance between the first and last segment bar. I use 1/2 the distance as the pivot for the line. I then adjust the lines angle so that it closely matches the close of the segments. The values that I used to determine the type of line I had were 0 = 0 to .249 and 1 = .25 to .749 and 2 = .75+ that has produced rapier accurate Fuzzy Patterns for me.

Steve

### **Re: Fuzzy**

Date :2/11/2002 9:45:11 AM Poster : claude Thanks a lot Steve for all your inputs about the Fuzzy indicators... it's very powerful. But I still have my question: When you say "The values that I used to determine the type of line I had were 0 = 0 to .249 and 1 = .25 to .749 and 2 = .75+ ", the only thing you can specify to the Fuzzy is 2=.75+ right? How can you specify to the Fuzzy that 1 is between .25 and 749? And how can you specify that 0 is between 0 and .249? The only parameter I can adjust is the maximum change, that means the change between 1 and 2 or .75 in your example. Am I forgetting something? Claude

### **Re: Fuzzy**

Date :2/11/2002 10:30:51 PM Poster : Steve Kratochvil

As I read back through the reply I gave I see that I have omitted the source for the ranges I gave. These are the percentage band ranges that I have used in a program I created to help me find Fuzzy Patterns. The program I created takes an export from NSDT and imports it into a Access2000 database. The FuzzyFinder is a little VB6 app that I have built to draw the Candlesticks and visually plot the fuzzy pattern on the screen. I then click on any of the bars and it tells me what the fuzzy pattern is to get to that bar. I have given it the ability to guess what the Max change would be or I can set the value and it will change the fuzzy pattern indicator setting accordingly. The ranges I gave are from the logic I used inside my app to determine the fuzzy pattern.

With your farther inquiry I understand your question a bit better. You are looking at the Max change and trying to directly translate the value range it point for point. The values I have given are percentages of the Max value. Example:

If a stock has a price of 60.31 and you set the Max change at .75 that would mean that a 2 would be the positive and -2 would be the negative coming to this bar if the segment bar before was \$.75 distance away. The ranges I have given would read like this 75% of \$0.75 is \$0.56, 25% of \$0.75 = \$0.18 and 0% = \$0.00.

In my logic I assigned the percentage ranges to the Fuzzy Indicator setting codes so that

I could translate the distance moved by my application.

To determine the speed of the slope use more or less segments in your Fuzzy Pattern. The more bars you use the slower the pattern. This is mitigated by the size of the Max value. If you use a small Max value on a large segment indicator it will be quick to react and stay active for longer periods.

Steve

### **Fuzzy Logic**

Date :2/7/2002 11:53:44 AM Poster : Steve Kratochvil

One thing that I feel needs to be mentioned. The Max change and Segments setting values of any of the Fuzzy Indicators needs to be able to take a variable so that an adaptive input could be created. As it stands these are static and this needs to be considered when using the indicator on periods that have greater or smaller ranges. If you are looking at the close then issues with a price in the 10 to 20 dollar range might have compatibility but if your issue is trading 50+ then the settings for your Fuzzy Indicators will not react correctly. If you use other indicators as input to a Fuzzy indicator and the input has a preset range then your setting would be fine. Example: Polarized Fractal Efficiency has a range of -100 to 100. Using fuzzy on this indicator you can determine slope and direction before it crosses the 0. This is just one use of the Fuzzy Indicator.

Steve

### **Re: Fuzzy Logic**

Date :2/9/2002 11:14:12 PM Poster : Steve Kratochvil

Another thing that I see is that the Fuzzy indicators can make great inputs into a neural net. The Fuzzy indicators have both a normalizing and Boolean effect on data making it better for a neural net to work with. As I have been looking at Fuzzy indicators I am now stepping into the FuzzyAND indicators and the FuzzyOR indicators. This combination of other Fuzzy patterns allows you to have a Fuzzy1(Lag(Close,3),-2,30,1) AND Fuzzy1(Close,2,3,.12) together in an attempt to signal a buy. This pattern matching is like candlestick patterns. I love candlestick patterns and these Fuzzy Pattern indicators take the concepts of candlestick patterns to a new level. The Fuzzy indicators are much more powerful and accurate compared to candlesticks. You just need to use them.

In addition to my comment below. The Static condition of the Fuzzy indicators can be used as a filtering quality on stocks. If a stock is not doing enough to trip the fuzzy indicator strong enough for your tastes, then maybe your logic is sound and the stock is just not worth trading. Food for thought. As with most indicators they have two points of view and you decide what you are trying to find. Use the indicator appropriately for that point of view.

Steve

## Neural Nets

Date :2/9/2002 11:38:41 PM Poster : Steve Kratochvil

As things are moving along I am looking at where a neural net should fit into my trading strategy and which ones are best to use. I have been sampling around. I did just like everyone else. I got the product I picked a great stock and then ran a Ward4 net on it and waited for it to perfectly predict the stock. Sad thing is. The neural net traded about as well as I could with out it (That was not good). I then took the AI college, even thought Steve is very long winded; I had my eyes opened to how I could use the Neural Shell Day Trader. This epiphany was all that I needed. The AI College had cleared up my Neural Net ideas and I took off. I have been building things like crazy and mixing everything that I should not. I have even burned out one hard lock already and I am working on my second. As I have been conceptualizing things Neural Nets have not really been part of the plan. I have just been building powerful indicators and learning how to make the Neural Shell screens show data more visually. If you don't know. You can have more than six indicators visible on the screen at a time. You can only have six window bands but each indicator band may have more than one indicator in it. I like to put me moving averages on top of my trading strategies or the close. I use them as absolute direction indicators if all else fails. I then use other indicators to determine what to do in between moving average changes (This is were the best trades are). Then after I have clear direction and other signals. I am seeing that these need to be the inputs into a neural net. I believe that the quality of the neural net's ability to accurately see the picture and predict trades depends on the quality and relevance of the inputs. Feel this way because if the Neural Net is an image of our mental ability then it would be just as lost in the example I first mentioned as I am when I look at the close plotted before me. I have yet to test this idea. I am hopeful with my serious push into the neural nets and their application to my trading system.

If anyone has any great advice or nets that they have used I would love to hear about it.

Steve

**Examples Examples Examples**

Date :2/12/2002 8:51:11 PM Poster : REVAHDAN

We all talk about building nets, overfitting, fuzzy and all. But how about people posting some of their work for others analyse and ameliorate and learn from. If you have a good working net please share it! What better way to learn?

Thanks to all who will participate . DR

**Re: Examples Examples Examples**

Date :2/15/2002 3:28:47 AM Poster : claude

Very nice Idea but unfortunately I don't have enough results to share it... And perhaps it is the same for all of us... CC

**Re: Examples Examples Examples**

Date :2/15/2002 9:09:50 AM Poster : Maxwell Craven

I think there's a couple of issues here. Firstly, someone may have some pretty good results, but not excellent, and they may be a little shy about putting their work on display for critique. Secondly, there's always the worry that if you give out your exact chart, then suddenly hundreds of NST users are making the same move you are and maybe competing. I think I fit in both categories, but I think like others I'm willing to share ideas I've developed if not the exact details.

**Re: Examples Examples Examples**

Date :2/15/2002 9:41:12 PM Poster : REVAHDAN

So how do we all start sharing? I agree with maxwell in principal

But I do not think that we with Neuroshell can truly influence a highly liquid stock or future.

I have the feeling that we have a lot of very bright peoples playing with neuroshell but not trading with neuroshell, I hope I am wrong.

A good net should work across many equities etc etc otherwise it be overfitted. Therefore we should not worry about negating the net.

**Re: Examples Examples Examples**

Date :2/15/2002 9:45:08 PM Poster : Steve Kratochvil

REVAHDAN, I have debated responding to your post for similar reasons as expressed by Claude and Max. I said to myself, "If I have the Holy Grail. Why would I give it away for free?" I feel I have the Holy Grail. I have worked months on it. I have paid for training with the AI College. I have studied all the examples that are provided in the basic set up and all the one's that can be down loaded from Ward.net. It was from these examples and sound basic technical indicators that I found very profitable inputs for Nets and Fuzzy indicators. There are plenty of examples of things to look at and learn from. On the other hand I did feel the lack of a manual when I first purchased the NSDT. A good old-fashioned manual was what I needed. I then set about to build my own trading bible. I started converting the Help files into word doc's and have begun working on my Neural Shell Day Traders Bible for myself. I have also thought about the idea of everyone trading the same trades I am. This is a fear that has gripped thousands of people before and will continue on into the future. This has been a concern voiced in Newsweek over

the use of artificial intelligence in trading systems. This is how I view things. The reason some indicators work better than others is because everyone can see them and react in unison at the same time. This ability for an indicator to be used in the same fashion by every one is why these things even have meaning. I then see that if a small group of people can trade in the same direction that I can, it will only fuel a greater reaction and make more money. Then this goes to the other end of the spectrum where if everyone is trading like me the money gets spread thin and my trading system is null and void. The truth of enough people being able to trade at the same time as me and in the same direction as me is remote and not really plausible. This is farther supported by investment clubs or groups that all trade in unison for the added increase in returns. In closing I have no objections to the content of your demand. I just object to being demanded and indirectly criticized for working hard and sharing about it in the forum because you can not find any examples. I will advise you to search the ward.net site for examples. You will find many there. Also go back through each and every forum post looking for the examples given. Then review the examples provided with your NSDT purchase. I feel that you will be pleasantly surprised and that will find more than enough examples. In the interest that your content is valid, I will endeavor to post more lengthy and detailed examples that will hopefully benefit everyone. I will also be expecting some examples coming from your direction.

Steve

**Re: Examples Examples Examples**

Date :2/16/2002 9:19:03 PM Poster : REVAHDAN

Great response! However let hope we can get more people involved in this realife exchange of ideas. And yes I most definitely will share my ideas and hope others will.

With all this talks how do we post on this discussion group.

Ward.net should provide a way for us to post charts, indicators etc etc.

Looking forward to a great exchange of ideas.

Thank you Daniel

**Re: Examples Examples Examples**

Date :2/17/2002 9:56:03 AM Poster : webmaster@ward.net

If you want to post something, attach it to an email to webmaster@ward.net. We'll put it up for you.

**Re: Examples Examples Examples**

Date :2/19/2002 10:04:44 AM Poster : Texas Bubba

Your right, I had to work a long time to get where my chart is now too, and I even took the class. You say that if everybody trades the way you do then you'll make more money. Now I'm just a cowboy, but isn't that only true if you get there first? What if the heavy hitters buy your chart first, then you ain't getting the choice prices on account of them driving the price up before you get there. When I was buying neuralshell trader, Steve Ward told me about some car company that trades millions of bucks of S&P futures with the ward nets. Guess what -I trade S&P futures sometimes too, but only one contract. Suppose I post my net and they take a liken to it and get in ahead of me.



I lost some money before I start. Hey, if they want my chart, they can send me a few new pickup trucks every year for it. But I did get lots of help here at this forum so I'm willing to help others too, I'm just afraid to put up my exact recipe.

**Re: Examples Examples Examples**

Date :2/19/2002 12:24:08 PM Poster : Steve Kratochvil

Valid and Agreed.

Steve

**Re: Examples Examples Examples**

Date :10/8/2002 3:47:24 AM Poster : Tom Nunamaker

Hi Steve,

I JUST bought NST. I was shocked that \$3000 on software didn't even have a manual..(unless there's one hiding on the CD I haven't found). Is there any API or language reference for the NST functions? Would you recommend putting everything in a WORD file if you had to do it all over again? In essence, what's the best way to learn. I have some things I'd like to program in NST (I do web development and some C++ work). How hard is it to create a DLL vs using the wizards?

Was the AI training something you would recommend to a newbie NST user??

Thanks

Tom

**Re: Examples Examples Examples**

Date :10/8/2002 9:12:40 AM Poster : Maxwell Craven

The Ward group recommends the videos to learn and I have to agree. There is a manual in the help files you can print, but I tried that once and you'd better have a lot of paper ready. The videos cover just about everything you need to get going, but not the DLL functions I don't believe. I can't program so I can't help you there.

**Re: Examples Examples Examples**

Date :2/16/2002 2:05:29 AM Poster : Darek

Hi everybody, I've been reading about indicators, solutions, real trader tips, millionaires. But, Is anybody who could tell us the truth how much money he earned using NST? If answer is YES, how much money he had to invest and how long (annual return on account and so on). Maybe we all are the members of 3000 \$ spend club Darek

### **Example EMA312.cht**

Date :2/17/2002 6:30:18 PM Poster : Steve Kratochvil

Every one wishes that they could impart to their trading system, their own human ability to see and recognize which direction the stock is moving. You would like to have an absolute indicator that said, "THIS IS A SHORT ZONE or THIS IS A LONG ZONE". This is the beginning of controlling and tuning your system and telling your Nets absolutely which direction that they should be looking. Here is how I keep my trading direction always looking in the right direction.

Note: I have chart preferences of a White Background and Black Foreground. Set these by going to the Edit menu and selecting Format Chart ... then the Colors tab. I set my Trading Strategy color to "Light Gray" on the color bar

Follow these steps:

STEP 1: Insert an exponential moving average (EMA) indicator and place it on your trading strategy. Go to the "Insert" menu bar to begin. Click "New Indicator ..." then "Exponential Moving Average" then "Next" then the indicator "Exponential Moving Average". Set the ExpAvg Periods = 3. Click, "Finished". Move your mouse cursor over the name "ExpAvg(Close,3)" of the new indicator and "Right Click". A popup menu bar appears. Select "Rename selected Indicator ...". Replace the name with "EMA3" and Click "OK". Select the indicator by clicking on the name "EMA3". Then drag it onto your Trading Strategy indicator. When you drag the cursor will change to a small stretched out bolded N. When you drag over the other indicators a dotted selection box highlights the indicator that you are over. Release the mouse over the Trading Strategy. You will see the EMA3 overlaid on your trading strategy. Click on the EMA3 name and select Dark Red on the color bar.

STEP 2: Repeat STEP 1 for another exponential moving average indicator and set the ExpAvg Periods = 12. Change the name to EMA12 and set the color Dark Blue. This should have you set with two Exponential Moving Averages (EMA3 and EMA12) on your trading strategy.

Step 3: Insert an arithmetic indicator subtracting the EMA3 value from the EMA12 value and rename the indicator EMA312RAW. Go to the "Insert" menu bar to begin. Click "New Indicator ..." then "Arithmetic" then "Next" then the indicator "Subtract". Select Operand #1. Click "Set parameter" and scroll down until you see EMA3. Click on it and Click "OK". You have just set Operand #1 = EMA3.

Select Operand #2. Click "Set parameter" and scroll down until you see EMA12. Click on it and Click "OK". You have just set Operand #2 = EMA12. Click, "Finished". Right click on the indicator name "Sub(EMA3,EMA12)" and rename it EMA312RAW. Now "Right Click" on any of the white open space of the chart and select "Hide/Unhide Data ...", scroll down until you see the Sub Graph with EMA312RAW, uncheck it and Click OK. This will hide the indicator.

Step 4: Insert another Exponential Moving Average base in the Time Series of EMA312RAW and smooth it out with 3 periods and rename it EMA312. Go to the "Insert" menu bar to begin. Click "New Indicator ..." then "Exponential Moving Average" then "Next" then the indicator "Exponential Moving Average". Select the Time Series and Click "Set parameter", scroll down until you see "EMA312RAW" click on it and then click "OK". Set the ExpAvg Periods = 3. Click, "Finished".

Now you have an indicator that is cleaned up and very meaningful. This is a useful

piece of information that you can tell your trading system. The interpretation and slant you put on the indicator is up to you. I am providing my example EMA312.cht with some of the possible points of view that one would take. The YES or NO is represented with an indicator EMA312 SHORT ZONES and EMA312 LONG ZONES. These have a filter tolerance of \$.04 to clear out any noise in the indicator. The value of the YES or No of the Long or Short Zones. The Fuzzy Shapes of the Values of the Long and Short Zones.

Also in this example I am going to show the difference that this indicator has in contrast to everyone's first Net. I am talking about the first net you make when you get NSDT installed. This is the Net that you just drop down with the default inputs and hope you are baking a golden egg as it optimizes. I have called it the Generic Trading Strategy. The effect is no better than yourself staring at the lines as they come from the right side. The contrast is the point where the more meaningful inputs can be used to guide to better results. This is represented in the Improved Trading Strategy. In this example I am only using the indicator side by side with the results from the Generic Trading Strategy. This is yet another way to use meaningful indicators to guide you nets.

I have sent up the EMA312.cht

Note: If you are going to use NSDT you need all the tools. You need all the add-ons. Buy them, not for Ward Systems, but for you.

Steve

**Re: Example EMA312.cht**

Date :2/19/2002 11:24:09 AM Poster : Ward.Net Webmaster

Mr. Kratochvil's chart can be downloaded [HERE](#)

Ward.Net Webmaster

**Locking indicators parameters in optimizations**

Date :2/23/2002 10:17:23 PM Poster : Steve Kratochvil

I wish to show you how to take clean meaningful indicators and provide them directly into any chart as data. This will have the effect of locking the indicators parameters. Locking "selected" indicators parameters in a Parameter Search or Full Optimization is not a feature in NSDT. Indicators output as data and inserted as inputs are not optimized as the other indicators are. Why would someone do this? Because we know that there are some things that are set in stone even though we do not have good explanation for it. Several Laws of physics fall into that category. We just accept them as fact and build on them because they have proven to be correct time and time again. At times in our normal every day life we take inputs at face value and use them as the constants for other decisions that are an interpretation of all the inputs. The same thing is true of the NSDT. So here is how to do things along those lines. Setting the optimization to Parameter Search or Full Optimization does not change any of the data elements like OHLC or Volume, everything that is created by the indicator wizard is fair game for optimization. That is a necessary feature in your study of your system. You need to do full blown tests as well as No Optimization at all, to try and glean all the information that an expert system is providing. Once you have an indicator that you see as producing consistent results no matter where it goes or which stock you put it on

then you would want to “lock it down” and do not let the optimizer try and guess for a better solution. Sometimes you might have an indicator that needs to “stay the course” and not over fit temporarily with the current blip on the radar. Your indicator might be based on sound mathematical reasons and should not be changed. The TEMA I mentioned in an earlier post is just such an indicator. Now in that indicator one setting is the multiplication by 3 this is not an input setting, the number three is formula structure and should not be changed. If it does change then the indicator is destroyed and meaningless to the optimizer. Here is how to lock in any indicator’s output so that it can be used in an optimization. We will need to move the output from “indicator” to “data” and then present it to the optimizer.

Step 1. Build a directory named Indicator Data that you will use to keep you indicator data. Example: “C:\NeuroShell Trader \Data \Indicator Data”

Step 2. Export the indicators as data. Go to the menu “Tools” then “Export Chart/Data ...”. In the popup window the default option of “Chart Data Values” is selected as well as “File”. Click “Next”. Now click the button “Add Data Item(s)...”. The indicator wizard will popup. Scroll down to your indicators. Select all the indicators that you wish to remain “locked” and click “OK”. Click “Next”. The default option of “Comma separated ASCII file” is selected. Click “Browse ...” and locate the directory you created (See Step 1). Now change the name of the export file to “Indicator Data.csv” and click “Finished”. Now you have an export file that you are going to use as an input.

Step 3. Setup Data Sources for the new directory and file. Go to the menu “Tools” and select “Data Sources ...”. In the popup window click “Add Directory ...” and locate the directory you created where you saved your export file (Indicator Data.csv) Click “OK” and then click “OK” to finish.

VERY IMPORTANT NOTE I: Anytime you delete a file from this Data Source directory you will need to close NSDT and reopen it to reflect the change. This is to prevent you from getting “Run-time error ‘9’: Subscript out of range” when you try to “Auto Scan” that directory for the change. This is an error that comes just from improper handling of the fact that the file no longer exists and needs to be removed from the list and insert reference. This error has no bearing on your chart data and is generally harmless unless you have not saved your work on the chart in a while. The error will crash NSDT.

Note: Leave the Category for this new Data Source directory as “Miscellaneous Instruments”.

Step 4. Insert the Indicator Data into your chart. Go to the menu “Insert” and select “Other Instrument Data ...”. You will see the (Miscellaneous Instruments) category now as a possible selection. Select (Miscellaneous Instruments) and click “Next”. Select the “Indicator Data.csv” file you created and click “Next”. You will see all the indicators listed and ready to be selected and placed into your chart when you click “Finish”

VERY IMPORTANT NOTE II: This is the only way that I know of to keep some indicators parameters locked and let others be optimized. This is the approach that I use for my inputs into my nets allowing me to provide rock solid inputs and let the Neural Net figure out the best trades. Then after I have an optimized Net that is good I take the settings that the optimizer found for the Net and copy them down. I then delete all the indicators data that I brought in because the next day’s action will not be in the indicator data. I guess having two similar charts would be a better idea. You could have

one for optimizing the Net and then the other that you trade with. I then enter the Net settings manually into a trading strategy with No optimization. I provide the actual indicators as inputs so that current new data is provided to the Net by the indicators in real time. This way the net will respond to the indicators much more accurately and more in line with your logic for using some parameters. I hope this helps.

Steve

**Re: Locking indicators parameters in optimizations**

Date :2/24/2002 8:29:07 PM Poster : Webmaster@ward.net Actually, there are two other ways to lock some parameters and optimize others, which we think you'll find easier. In any case, the methods below will allow the indicators to be used in real time too. First is to just save your indicator as a custom indicator, and while doing so hide the parameters you want to lock. Then they can't be changed or optimized. Another way is to set the min = max of the parameter ranges of the parameters you want to lock during optimization. The parameters will be locked at the value that min and max are set to.

**Re: Locking indicators parameters in optimizations**

Date :2/25/2002 9:04:14 AM Poster : Steve Kratochvil Very nice, "Hidden from user" option includes the optimizer. Now I like that. Thanks, Steve

**Re: Locking indicators parameters in optimizations**

Date :2/27/2002 11:39:33 PM Poster : Steve Kratochvil I am back to my first explanation for the "indicator to data shuffle" to lock the parameters on the indicators that have a password on modifying them. If you have any ideas, I am open to them. I must confess, I can import any data known to man now. I could even take abstract data into a system if it could be quantified as numbers or a number over a sequence of time.

Steve

### **insights from users**

Date :2/26/2002 3:58:33 AM Poster : ed condon Kudos and many thanks for recent comments on what users are doing. Very helpful and thought provoking. Steve k, Bubba, and webmaster, etc. are really making this forum valuable. Don't know about the Holy Grail, but you guys are making NS tools helpful for me. Many sincere thanks

### **Re: insights from users**

Date :3/5/2002 5:06:59 PM Poster : John Hegarty I too have found these to be very useful and I'd like to offer my thanks as well. One thing that I would also be interested in is getting an insight to others workflow processes. An area that I have struggled with is giving some consistent structure to developing a trading model and feel that I have not got much beyond trial and error. I'd really like to feel that I'm getting in control believing that a more rigorous approach would help get me on track. It feels that this might form 2 parts the logical workflow itself and some form of file/reference structure for the charts that are developed along the way. So any thoughts on this topic would be really welcomed. Regards John

### **Re: insights from users**

Date :3/6/2002 2:06:41 PM Poster : Texas Bubba I'm pretty much fixed now on what I'm doing, but back when I was tryin different stuff, I found the best thing is to seperate my methods. We cowboys are very organized. So I had one folder where I keep charts with regards clustering indicators, and one where i keep the neurel indicators stuff. Then I'd always name my charts something what described it like "SPY cluster3 with price momentum.cht". Then no way I'd forget later what was I doing at the time. You have to be careful to throw out charts that are goin no where or else your folders get cluttered up to where you don't know where your at.

### **Re: insights from users**

Date :3/7/2002 12:11:11 PM Poster : Steve Kratochvil Hey Bubba, I wish to digress on the work you have done with clusters. I see them as a panel of experts on steroids. What have you done with them?  
Steve

### **Re: insights from users**

Date :3/8/2002 8:57:28 AM Poster : Texas Bubba Now hey I do agree with how you put that! The clusters been very good to me, but there wasn't nothing to it. I just used the little critters like the examples said to. You just put them in that  $A < B$  cause your looking for if your bar now is close to where your buy bars hang out or close to where your sell bars hang out. You do have to experiment a tad to make sure you find the stuff that likes to get together right before the S&P goes up or goes down. The stuff Steve Ward said to use in the class was pretty good, but some other things works for me maybe a little better, like some combinations of maximum and minimum value put onto spreads and also number of bars since high or low occurred.

### **Re: insights from users**

Date :3/8/2002 10:30:32 AM Poster : Steve Kratochvil I just would like to point out the all of us need to watch our typing. I noticed that one of my posts wiped out and it was

the '<'B' portion of the indicator that is also an HTML Tag for Bold. Here is a safe way to state the indicator 'A'<'B'. I have made the adjustment in your post below. Now let us continue with the Min Max thing you have going on and number of bars. Why did you chose these indicators? Steve

**Re: insights from users**

Date :3/8/2002 10:48:40 AM Poster : Webmaster@ward.net Thanks for pointing this out Steve. We have fixed Bubba's post. We need to translate greater than and less than signs so users don't have to worry about that. We'll try to fix that problem very soon. On 03/08/2002 10:30:32 AM Steve Kratochvil wrote: I just would like to point out the all of us need to watch our typing. I noticed that one of my posts wiped out and it was the '<'B' portion of the indicator that is also an HTML Tag for Bold. Here is a safe way to state the indicator 'A'<'B'. I have made the adjustment in your post below. Now let us continue with the Min Max thing you have going on and number of bars. Why did you chose these indicators? Steve

**Re: insights from users**

Date :3/12/2002 8:17:03 AM Poster : Texas Bubba I used those cause I figured I should be finding the highs and lows in a backwards window of my spreads. Now I just let that optimizer run a tad and find out how big of a window we should be lookin thru. So i find out how big or how small the spreads got to be, plus how long ago they was. Then i turn on them cluster critters you say is on steroids!

**Re: insights from users**

Date :3/12/2002 4:29:04 PM Poster : mstigall

Bubba - do you use the contribution factors on the clustering to find the significant inputs? Or do you limit the number of inputs in another manner?

**Re: insights from users**

Date :3/13/2002 4:30:01 PM Poster : Texas Bubba

Yep I do use the contribution factors version of the clusters.

**Re: insights from users**

Date :5/20/2002 3:45:24 PM Poster : Jeff Kilinski

Is this the Ed Condon formerly of JPMorgan London and CSFB London?

Jeff

**How neural nets work vs indicators to use.**

Date :3/6/2002 1:58:24 PM Poster : Dale

I am a newbie at neural nets, but if I am understanding the way that Neural Nets train, they look for patterns in back data and project those patterns to predict future price movements.

If this is the case, then it seems to me that indicators that buy/sell on breakouts (i.e. CCI) or indicators that might liquidate positions on overbought/oversold (i.e. ADX) would not be of much value to a neural net. On the other hand, indicators like moving averages (but not crossovers), cycle analysis techniques, and perhaps some volume indicators would be much more useful.

Is this correct? Or where am I going wrong?

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**Re: How neural nets work vs indicators to use.**

Date :3/6/2002 2:37:44 PM Poster : Steve Ward

Don't worry, there's rarely a right and wrong. There's only the Golden Rule of neural nets: do whatever works best! So I'll respond to this from a strictly technical neural net point of view. I'll let others respond with respect to trading efficacy. My feeling is that breakouts are ok as long as the indicator is giving you the distance between the current time series and the one you are looking for it to break out of, as opposed to a binary signal that it's broken out or it hasn't. I think CCI does that. On the other hand, I can't see what a moving average gives you at all by itself, unless it gets compared to the price or another MA, etc. So instead of feeding in several MAs and prices, and letting the net try to figure out that it should compare, I'd rather feed in the spread between two moving averages, or one MA and a price. That way you give the neural net the advantage of your experience. Your clues let the net stand on the shoulders of giants. On the other hand, I'd let the optimizer find the appropriate averaging periods.

**Re: How neural nets work vs indicators to use.**

Date :3/12/2002 4:35:16 PM Poster : mstigall

Neural networks are pattern matchers... but they're also generalizers. So I thought I'd add two points (pardons, Steve ). 1) The output of the neural network will never be "exact" - its always a general direction or trend. An analogy is the windsock at an airport; shows direction great, but doesn't give any indication of windspeed. 2) The neural nets can memorize patterns, and that's usually a bad thing. Since the pattern



won't repeat in exactly the same way every time, you want the neural network to generalize the pattern to something it can recognize (hopefully in sufficient time to do some good trading) in later time periods.

### **When optimization is really slow**

Date :3/11/2002 1:38:37 PM Poster : Olli Myllynen Dear all, I want to raise my objections to the guidance given on optimization and the trailing stops in tips and examples section. Trading futures without stops is outright dangerous. Any trading system package should therefore be fully capable of testing stops also to be seriously taken for futures trading. Furthermore, the "oldfashioned" stops are more than just insurance. I have had the NST Professional for two years now during my 12 years as a trader. I have not seen many neural nets, which does better job than chandelier exit, yo-yo exit and initial stop loss combined in trending futures, like the currencies. There are also other alternatives. It is fairly easy to produce nets giving good timing in entries, but far more difficult to make nets, which are good on both entries and exits. My partial solution to the notorious speed problem has been to code the parts I need in to DLLs using PowerBasic - unfortunately there seems to be a PowerBasic memory leakage problem included. (This restricts ones selection of OSes - you are stuck to Win98 or ME which can free up the unused memory, while the M3 Data Server requires NT or better which cannot - so no daytrading yet) I am making money with my approach, and I want to have the freedom to develop the ideas my way. I think this is what the NST should be intended to do. The reasoning given in the tips section is more like an excuse for something which should be able to be handled better in the NST. All this said, I am still mostly satisfied with the NST. I just do not like an approach where an important thing is turned into something one should avoid just because the application cannot handle those situations well enough. There should be more pressure towards the programmers to find out ways to make this important feature more usable. To the wishlist I would also include better handling of portfolios. Now if we would see that in NST, I would be exited!  
Olli

### **Re: When optimization is really slow**

Date :3/11/2002 5:03:18 PM Poster : Steve Ward

Since I was behind that tip, I'll answer your objection. We never said that stops shouldn't be used. We just proposed the argument that they probably shouldn't be optimized. I stand behind that statement, because I still think it is better to optimize a strategy to make the best decisions it can make without stops. It shouldn't learn to use stops as a crutch instead of learning how to make proper trading decisions. The crutch keeps it from finding more profit the "right" way. Get a trading strategy that makes the right entry and exit decisions. Then the suggestion is, put the stop on with your broker in case your model falls apart later. However, as I've said many times before, there are no absolutes in this game and it is certainly appropriate for you to disagree with any guidance we give, and ignore as much as you like.

Moreover, we don't agree that these particular types of indicators are improperly programmed. We mentioned how they are in a sense "recursive", which means at each step geometrically more processing is required than with a normal strategy. On the other hand, there may nevertheless be ways they can be sped up, and we have been investigating such possibilities.

Finally, we fully expect PowerBasic to fix their memory leak, and even if they don't we'll probably offer alternative solutions. PowerBasic is our "Easy Language" and it is much too important to be overlooked.

PS -I haven't noticed any our our PowerBasic users adding to my post on the

PowerBasic forum. Why don't you let them know you think it should be fixed too?

**Re: When optimization is really slow**

Date :3/12/2002 2:46:28 AM Poster : Olli Myllynen Steve, I appreciate the work you have done by letting us have the NST. I just want to give you my input in something which may deserve an attention, and not to let you think this problem/feature in NST is not important, as you hint in the tip. With regard of stops I think differently than you. And the software I use has to allow this. Your approach to stops is clearly - as you said yourself - one of insurance. There is nothing wrong here. However, I want to use stops in an other way. In many of my systems they are the exits. No other exits are used. This approach is often much more profitable and less riskier than the neural net signals for exits. Furthermore, the stops kick in during the action, not reacting after the fact. When my risk is limited and I know that, this allows my money management (ie. bet sizing) scheme to take more contracts, thus increasing my profit potential. Most often I use the neural signals as setups, and the entry is triggered by other means. I still rely on the neural nets, but they are not everything. Important, yes. Optimizing stops is just as important than optimizing anything else. If one does it wrong, it is just as deceiving than optimizing anything else. Still one should be able to do this, if one wants to. I want to. I need to. I do not believe in having similar parameters in all markets. So optimizing a trading strategy often requires optimizing stops, too. But one has to use one's head here, not just to let the computer churn. If the code is already clean and fast around optimizing, then there is not much else to do than to get the fastest processors available. I am still a bit suspicious. I have hard time to accept that for a 2000 GHz P IV processor with 1024 MB memory and the fastest motherboard and HD in the shop it takes all night in optimizing a couple of parameters. If you can take a look at the code of optimization, then at least you know there would be someone appreciating it. About PowerBasic - yes, I think I will support you there. All in all, NST is a great tool. BTW, if anyone wants to take a closer look at the kind of stops I mentioned as examples in the original post, take a peek to <http://www.traderclub.com/discus/board.html> , under the section "Bulletins" there. Chuck LeBeau has made some remarkable work public for everyone to see for free. Olli

**a simple strategy**

Date :3/12/2002 12:56:40 PM Poster : albertl

I just saw on another forum the more then simple strategy BUY on highest high of X (~80) days SELL on lowest low on Y days etc for Shorts this is presented like if it was the yellow of the egg last time I tried something similar I was not convinced. Who has an opinion how to improve ? albert

**Re: a simple strategy**

Date :3/15/2002 4:53:03 PM Poster : Dale

I've tested such a system using TradeStation 2000i with mixed results. I do not know how you would program Neuroshell to do it though. With TradeStation you have to optimise the number of days back and I don't feel comfortable trading optimized numbers myself.

**Re: a simple strategy**

Date :3/16/2002 3:27:34 PM Poster : Xprogrammer

I'd use the same ones Bubba says he uses - maximum value and minimum value indicators, or the days since high/low occurred indicators.

### **What "Exit Indicators"?**

Date :3/12/2002 1:14:01 PM Poster : Kenny Your recently posted Tip and Techniques comments on speeding up optimizations suggests using indicators in Trading Strategy: Exit Indicators. My version of NST 3.5 doesn't include such a category. Is this a indicator category found only in the day trader version? Or is it a misprint?

### **What "Exit Indicators"?**

Date :3/12/2002 3:34:23 PM Poster : Webmaster@ward.net We should have said Trading Strategy: Exit Signals. We'll fix that.

### **What "Exit Indicators"?**

Date :3/12/2002 3:48:01 PM Poster : Kenny  
Still confused. In my version of NST, I find the following three categories: Trading Strategy: Protective Stops Trading Strategy: Position Information Trading Strategy: System Information I've looked again, but there's no Trading Strategy: Exit Signals either.

### **Re: What "Exit Indicators"?**

Date :3/12/2002 5:34:00 PM Poster : Webmaster@ward.net  
It isn't unique to the DayTrader. If you're entering exit conditions and press the indicator button, it's right at the top (easy for the eye to skip over). You should also be able to see the category if you just insert a new indicator with the Indicator Wizard. If you still don't see it, you'd better contact tech support.

### **NST study materials**

Date :3/21/2002 11:53:03 AM Poster : Dan Kinter I am a NST newbie. I have assembled, and am systematically going through (usually repeatedly) , the following NST materials for study. Once I have gone through all of the materials - including practising all of the examples - and then organizing and prioritizing the ideas I have developed along the way, will I begin my "exploration":

The materials are:

1. Manual - (I have printed out the entire "Help-Contents" file and organized it into two binders)
2. Videos
3. AI Course
4. Ward.net site (printed out all topics which appear helpful and put them into one binder and then copied the entire Discussion Forum postings/responses into Word and then printed them out and placed in a second binder - about 200 pages)
5. Indicators - organized all indicators into three binders - indicators are divided into categories - obviously I'm not going to "study" the indicators, as such, but use the binders as a handy reference source Does anyone have any other ideas or other suggested materials for me to consider? Thanks. Dan

### **Re: NST study materials**

Date :3/21/2002 9:47:45 PM Poster : Steve Kratochvil

Well, Dan that is what I did and it seems to be the best approach. You will be well grounded and ready to translate your ideas into system after a little while. The next best thing, that I think might be of use, is this forum. I check here everyday and look to see if anyone has mentioned anything worth looking into. I have also tried to contribute here on the forum to everyone by giving them parts of work I have done. I explore the other ideas if they seem logical etc... It sounds like you are off to a great start. One thing that I might offer is this. Start with indicator first. The better the indicator the better the net will be. I am hopeful that I will be able to start sharing high quality information about Nets in the coming days.

Steve

### **ANM artificial neural mesh**

Date :3/22/2002 6:52:41 PM Poster : albertI Hello, Some people claim that this NN technique (ANM) is able to adapt the NN net structure itself to temporal data , this type of learning is supposed to do something much more drastic and efficient than just changing the weights of the neurons. I wonder if s such a technique is really existing. Has any of the NST's add ons similar features or ihas Ward Systems something similar up the pipeline? albert

### **Meshes**

Date :3/22/2002 7:12:20 PM Poster : Dale Does Neuroshell uses "Meshes" or is there an add-on that will use them. From my research I understand that meshes are a superior neural net technique.

Thank You, Dale Felber

### **Re: Meshes**

Date :3/25/2002 8:44:31 AM Poster : Steve Ward

There are literally hundreds of different types of neural nets, and each has its advocates as well as the original developers who understandably hype their art. Year after year some new type gets its 15 minutes of fame. To date the most completely unbiased and credible study I know of was done several years ago by the National Institute of Standards and Technology (NIST) in which they declared Probabilistic Neural Nets (PNN) the best classifiers available at that time (at least on the databases they tried). That is one reason we included PNN in the NeuroShell Classifier and the Adaptive Net Indicators addon.

The truth of the matter, though, is that what you feed nets is probably several times more important in the financial arena that what type of net you use. That's because, unlike in science, there are far too many variables moving the markets to capture them all. None of the hundreds of variations of neural nets (including ours) is going to be a panacea when it comes to predicting markets. If you get the right indicators at the right time on the right issue in the right way without overfitting, almost any good net paradigm will do well. That's why we like Turboprop2 - it's fast enough to build thousands of nets in a relatively short time during optimization.

**Simple Line in the Sand Strategy**

Date :3/29/2002 7:27:03 AM Poster : ghkramer Your strategy is called a turtle. The simplest strategy that I've used is to enter the market based upon a random number generator (e.g., Buy if RandomNumber > x) and exit using money management techniques (stop loss and an adaptive trailing stop such as a volatility stop). I found that this will out perform many indicators.

**Re: Simple Line in the Sand Strategy**

Date :4/1/2002 1:46:50 PM Poster : RiskArb Can you tell me briefly, how to set volatility based stops in the Trader Pro?

**Re: Simple Line in the Sand Strategy**

Date :4/4/2002 11:28:15 AM Poster : ghkramer  
A<B(Close,Mul2(3,Avg(Sub(max2(High,Lag(Close,1),Min2(Low,Lag(Close,1))),14))))

**Re: Simple Line in the Sand Strategy**

Date :4/4/2002 7:33:59 PM Poster : ghkramer  
opps, left something out Buy  
A>B(Close,Add2(Lag(Close,1),Mul2(3,Avg(Sub(Max2(High,Lag(Close,1),Min2(Low,Lag(Close,3))),14)))) Sell  
A<B(Close,Sub(Lag(Close,1),Mul2(3,Avg(Sub(Max2(High,Lag(Close,1),Min2(Low,Lag(Close,3))),14))))

**Re: Simple Line in the Sand Strategy**

Date :4/8/2002 10:45:12 AM Poster : vince  
Is it possible for you to post this strategy as a downloadable file? It is a little confusing the way it is now. Thanks

**Re: Simple Line in the Sand Strategy**

Date :4/8/2002 8:50:42 PM Poster : Steve Kratochvil  
Hey, Vince. I took a look at this when it was posted. I will send the chart I did on this, up to Ward Systems. I did the chart on 1 min bars and I added a little to the idea just to cut the losses back a bit, but it is still only what Ghkramer produced. Enjoy.  
Steve

**Re: Simple Line in the Sand Strategy**

Date :4/9/2002 10:20:43 AM Poster : vince  
Ok Thank you very much.

**Re: Simple Line in the Sand Strategy FILE**

Date :4/9/2002 2:56:49 PM Poster : Ward.Net Webmaster  
The file referenced in this post can be downloaded from the following link:

[Simple Line in the Sand.zip](#)



**Re: Simple Line in the Sand Strategy FILE**

Date :4/22/2002 5:04:09 PM Poster : albertl

Hello, would it be possible to have some comment about this strategy? Is the multiplication factor 3 not far to much ? What is the supposed advantage compared to a simple ATR band break out system? Thanks albert

**Re: Simple Line in the Sand Strategy**

Date :4/9/2002 4:05:57 PM Poster : vince

Thanks for sendig the chart to Ward Systems. One last question:- Do you do a full optimization or a parameter search?

Vince

**Re: Simple Line in the Sand Strategy**

Date :4/10/2002 9:24:51 AM Poster : Steve Kratochvil

Neither. I believe that Ghkramer presented a "RULE" based trading strategy. Ask Ghkramer what his reason was for the values he used.

Steve

**Re: Simple Line in the Sand Strategy**

Date :4/8/2002 11:38:01 PM Poster : ghkramer

Re: "Is it possible for you to post this strategy as a downloadable file?"

Sorry. I can't seem to copy and paste any equation in NST. I manually copied it onto paper (its been years since I had to do that) and typed into the forum. They must be using their own homebrew editor because most of the existing components that people use in MS Windows software development allow the user to cut and paste.

The equation is just nested functions. You have to do a lot of clicking, scrolling, and clicking to insert all the functions from left to right. Sorry, thats just the way the program works.

**Re: Simple Line in the Sand Strategy**

Date :4/10/2002 11:10:55 AM Poster : Vince

Hello Kramer regarding this strategy, do you do a full optimization? If not what values did you use?

Thanks

**Re: Simple Line in the Sand Strategy**

Date :4/22/2002 10:14:31 AM Poster : Vince

Do you optimize this strategy?

Thanks

Vince

**mesa cycle software**

Date :4/4/2002 8:14:47 PM Poster : davide accomazzo

Dear friends and colleagues:

i am new to this forum...i would like to receive any feedback at all on the cycle software Mesa...I trade frequently with proprietary oscillators and stochastics and i believe a nontraditional software such mesa would be nicely complementary; however, i can't seem to find third party research on the software...if anyone has any direct experience i would like to discuss details.

best regards to all,

davide

**Re: mesa cycle software**

Date :4/5/2002 9:46:09 AM Poster : Steve Kratochvil

I own John Ehlers MESA2002 indicators for NSDT and have been messing around with them. I am interested in your approach to your oscillators and stochastics. What I have found is that the MESA2002 indicators do work as expressed. My only major issue with them, at this time, is performance intra day. It is so bad that the recalculation actually caused me slippage of about .10 to .20, which is \$100 to \$200 per trade on a \$250 to \$500 target scale. The only way that I compensated for this was to eliminate all the MESA indicators I had except for one that seemed to help the best. That was even bothersome. So I have put them on the End Of Day Trading shelf for that approach. If you are an End Of Day trader then you will not notice the performance hit. I have read John Ehlers book Rocket Science For Traders where he goes into detail on MESA indicators and have seen how they can be used. If you don't have this book it is worth the read for understanding how MESA ticks. I have even use the MESA as inputs to the Fuzzy Logic indicators. One thing that might be of interest to you and your oscillators or stochastics is the Fuzzy Logic indicators. With Fuzzy Logic you can determine the shape of the indicators that you already understand and have sound reason to use. I use Fuzzy because it gives me more than just crossovers or penetration lines of the same indicators that I have grown attached to. The knowledge that oscillators or stochastics work to indicate conditions of a stock or market is common and accurate. The interoperation of these is where it all breaks down and confounds the masses. MESA looks good and it seems to be in a class all by its self. It is both an oscillator and a stochastic, at the same time it is neither. It is designed to determine when you are in a trend or a range(cycle). It seems to be able to do that. Like I said the performance hit eliminated it from my system so I have limited actual experience with it.

Steve

**Re: mesa cycle software**

Date :4/9/2002 7:56:38 PM Poster : davide accomazzo

Hi Steve:

Thank you for your comments..I normally use stochastics and oscillators on a daily or weekly basis for option trading..I find that the overbot/oversold levels played with options give me a much better rate of success since i dont have to be right on the money right away...I do use them on an intraday basis also for small/quick fx trades....in

this case i combine them with flow analysis (mostly fx) and bollinger bands...this is based on fibonacci and other inputs..i am interested in mesa cycles so that i could avoid ob/os signal when trending and also i could perhaps singling out additional cycles which are not picked up by stochastics...looking forward to exchange more ideas..best regards,  
davide

**Re: mesa cycle software**

Date :4/11/2002 12:54:15 AM Poster : Steve in California

I'm a novice at thinking about Mesa, but I have spent a good number of hours working through the Rocket Science text and looking at the Sinewave indicators plotted against a time series. Here's how I think about it:

1 During what Ehlers calls cycle mode, there are fewer false breakouts with the Sinewave indicator than with traditional oscillators.

2 Ehlers clearly states in his book (and I agree) that the transition from "cycle mode" to "trend mode" and from trend to cycle isn't identified well in Mesa.

If I understand the points made by David below correctly, the value of Mesa is different than what he's looking for. 1) Mesa isn't going to find more cycles than traditional oscillators, it's going to find less and this is a good thing (i.e., false oscillator breakouts are avoided during cycle mode. 2) Mesa isn't going to help avoiding "ob/os signal when trending", in fact, my opinion is that oscillators for this are better.

I've been looking at Mesa indicators within Tradestation and don't have all of them as dlls for use with NSDT.

Finally, regarding Mesa and how to think about it: it's on my mind that Ehlers (and Mike Barna) have several systems on the top ten systems lists that FuturesTruth keeps through its audit process, each of them doing more than 100% per year for several years. In his "developer interview" with FuturesTruth, Mike Barna says that the "technology [i.e., R-Mesa] combines elements of MESA and R-Breaker" and that this technology is "well know and mature". It seems to me that this is further confirmation of what my own view is: namely, that Mesa cannot, by itself, drive a profitable strategy but must be combined with other indicators to overcome its major weakness (i.e., not being able to distinguish early enough between trend and cycle modes at the transition periods between them).

### **Predicting Options**

Date :4/10/2002 1:59:36 AM Poster : Mark Simpson I've created a DLL function to model a continuous option series based on a stock price, and I now want to create a prediction based on the data I've calculated, rather than the stock price. I can create a prediction based on the calculation, but the calculation is incorrect, because the trading points are placed on the closing price. I also need to do it in realtime, so exporting and then importing isn't an option either. Effectively, I want to replace the "Closing Price" with "My Own Calculation Of The Closing price". Has anybody got an ideas? Thanks

### **Re: Predicting Options**

Date :4/26/2002 10:39:27 PM Poster : Richard Nowak Create the function in a DLL that returns "My Own Calculation Of The Closing price" and use that as an input to the predictor. If this is too obvious to you then I probably don't understand your question.  
Rich

### **What would you do?**

Date :4/11/2002 5:09:38 PM Poster : sfrobins What would you do if you developed a trading strategy with NeuroShell Trader Professional that was correct %80 of the time, and was returning giving you an average return ( on paper ) of about %10 per week, trading stocks; and you had NO MONEY to invest. Suggestions? Thanks, Stewart

### **Re: What would you do?**

Date :4/11/2002 6:22:58 PM Poster : Bill VanDyke If i was in your apparent situation, i'd check the model for any possible future leaks..and if there are none..i'd partner with Steve Ward to market what sounds like the Holy Grail.

### **Re: What would you do?**

Date :4/12/2002 12:16:34 AM Poster : sfrobins How do you check for any possible "future leaks"? Do you have a methodology for that?

One thing about this is that it is time consuming, I optimize every night to adapt the strategy to new market conditions. I don't know if this is absolutely necessary, but it does yield fairly consistent results. If I were to limit the data, set, perform the optimization, and then test it against additional data added to the data set, one day at a time, it could take a very long time to get through a year's worth of data. In other words, I don't have much of a time range to test out of sample, because I am always optimizing on the most up to date market data that I can get. The test out of sample is the trade I make on paper tomorrow based on any signals that I get after optimization. I understand data normalization, training, and testing issues for neural nets; I am finding that the strategy is most efficient immediately after optimization, and performance degrades as time progresses ( and theoretically, market conditions change ). Therefore, I optimize using the latest data I can get.

Thanks,  
Stewart

### **Re: What would you do?**

Date :4/11/2002 7:13:54 PM Poster : Steve Kratochvil

I just cannot resist your question. Better judgment is nagging at me in the back of my head. I do feel that your question it is a bit leading or fishing. So in light of the fact that the true question you are asking is not given I have these things to say. If you are trying to get someone to fund you. We have all worked very hard to get where we are, even if it bankrupt, so please do not ask us for money. If you are trying to sell it. I have four charts that produce 100% and 30%+ return on Day Tradable stocks. If you are truly asking for advice. Here is my two cents. If you believe in your system and it has proven to make money after solid testing then work to save \$30,000 over the course of this next year. During this time let your system run and prove to you that it is going to work. After you have this small sampling of your system and everything is as it should be, then you should commit all of your hard earned resources to your system with confidence that it will work. That is what I did.

So how do you answer your own question?

**Re: What would you do?**

Date :4/12/2002 12:38:07 AM Poster : sfrobins Steve It's an honest question... I have achieved my result at my weakest moment financially due to the economic downturn, and a divorce. I am a software engineer in silicon valley and I have been doing this as a hobby for 9 years. It's only been in the last couple of years since the advent of the Neuroshell Trader product that I have been able to accelerate my development and achieve the desired result. If I trade now, I use my rent money to do it. I also have a great desire to do this type of work professionally. I always felt that computers were only so useful if you don't have a really good problem domain to apply them to. Patience would be easier if I hadn't been working on this since 1993. The option you have presented is the only one that occurs to me, but there might be others. Sell it? Publish a newsletter? Something other than "trade it"? Look for a job working for a mutual fund or a hedge fund? I finished this particular strategy in August of 2001... I have been watching it for about 6 months now. In the last month, I have started to share the signals with other people acting as observers to get an independent verification of the results. I ask myself daily if the strategy is really this good, or have I become really adept at deluding myself. When I say it makes %10 per week, I don't mean that this is based on an optimized backtest. It's actually following the signals generated as they come from day to day. I was simply looking for other techniques that didn't require another year or two of my life. I was looking for other people out there who have faced similar situations and found creative solutions. I am not looking for some kind of handout. I get my money the old fashion way, I earn it :-)

Regards,

**Re: What would you do?**

Date :4/12/2002 11:06:46 AM Poster : Steve Ward You have an interesting situation, that's for sure. If you start a fund or newsletter, then there's expense and hassle involved, but at least you are your own boss. If you try to go with an established company, then there's lots of negotiations involved, lawyers, etc. If you go with family money (assuming you can find some), then there are hard feelings in the family if there are some bad times as markets change. None of that would appeal to me. lately I've started trading eminis instead of equities. Because of the margined leverage, I make a whole lot more money for the same (or less) effort. Some of the other futures have far less margin required than the eminis. If your stock models will work for futures contracts, then that would be the way I'd go. Not a big investment can get you a big return. (Warning - you can lose a lot too, in a heartbeat!) The new stock futures may be the way to go if your models don't immediately translate to futures contracts. Predict the stock and trade the futures contract. Maybe some of the readers here can add some opinion on those new contracts. But if you decide to have people seek you out, let me put your story in the "Real Traders" section of our website. I'm always trying to get people to let me tell their story there.

**Re: What would you do?**

Date :4/12/2002 3:07:14 PM Poster : albertl Hello Steward, Arent you able to put your system in a few custom indicators and sell them or lease them to NST customers ? Or come to Luxembourg on a holyday and teach me trading for a while ... all the best to you albert

**Re: What would you do?**

Date :4/12/2002 3:56:29 PM Poster : Steve Kratochvil Now, that is something can relate to. I am also a software developer and also saw my worst economic downturn when I got divorced. It was a rough and turbulent time. It was from that moment that I started really reaching for my goals and thus far I have reached all of them. I can also relate to using your rent money. I remember one instance where I did not have any food for three days until payday. I know when the chips are down. So, I understand, more than you know. Forgive my abrupt posture, but your question was a little cheesy. I am now feeling bad that I almost berated you. I should have listened to the little nagging voice.

Steve

### **Detrending and preprocessing data series**

Date :4/26/2002 7:06:39 PM Poster : Russ

As a newbie to neural nets, I have read a great deal about the importance of detrending and/or preprocessing data series before implementation in a net. What do others think of this? How does one detrend and/or preprocess data before placing into NST?

Thanks.

Russ

### **Re: Detrending and preprocessing data series**

Date :4/30/2002 2:59:59 PM Poster : RiskArb

"normalization" in statistics, has a very specific meaning and refers to the transformation of data by subtracting each value from some reference value (typically a sample mean) and dividing it by the standard deviation (typically a sample SD). This important transformation will bring all values (regardless of their distributions and original units of measurement) to compatible units from a distribution with a mean of 0 and a standard deviation of 1. This transformation has a wide variety of applications because it makes the distributions of values easy to compare across variables and/or subsets. If applied to the input data, standardization also makes the results of a variety of statistical techniques entirely independent of the ranges of values or the units of measurements

### **Re: Detrending and preprocessing data series**

Date :4/30/2002 3:28:29 PM Poster : Webmaster@ward.net

All of our neural nets except the Adaptive Net Indicators add-on automatically do the type of normalization RiskArb describes to the inputs. The neural nets in the add-ons Neural Indicators and Adaptive Turboprop 2 let you control the length of the period over which the normalization takes place (it's the lookback period). In addition to what we do automatically, you may want to do some detrending over time. We feel one of the easiest ways to do that is use inputs like percent change, spread percent, etc. That way a \$10 change when the price is \$60 looks to the net like a \$1 change way back when the price was \$6.

### **Re: Detrending and preprocessing data series**

Date :5/1/2002 4:53:10 PM Poster : MattR

I have some questions about data preprocessing in NS that is mostly handled internally. Can you shed any light on how data is adjusted? Does it smooth data automatically (averaging)? I assume it isn't automatically adjusted to a percentage change/log percentage change as there are both price and percentage change choices? Are there any variance/standard deviation adjustments, automatically included? (more on this) I assume no sampling/filtering is included? (more on this as well)

I have been wondering about adjusting output variables (ie usually whatever price change prediction) by some measure of volatility. When trading, one is constantly battling transaction/slippage costs. In this regard, volatility is a desirable, not necessarily a factor that one necessarily wants to remove from consideration. It seems like it would be valid to build nets to predict just prices moves (percentage or



otherwise)...ie volatility adjusted moves times volatility.

I have also wondered about detrending data. First, I understand the skew that trending data can cause in neural networks. In using NS trader, the most likely sought after goal is to build wealth. Thus, using the predictions to predict tradable opportunities (and perhaps using profit objective functions), seems like a reasonable approach. However, trend factors can have more of an effect on trade profitability than other detrended factors. So, a set of inputs that result in an output implying a very profitable opportunity might largely be do to factors that have been removed - trend. I find myself somewhat confused/running in circles on using a monetary objective function while removing trend factors.

Is data sampled or filtered in any way? For example (familiar/old issue), a person utilizing a neural net for trading would often like to predict outlying (not necessarily extreme) events. With a large cluster of untradable/undesirable observations, an objective function using some sort of summation or lower order error function can result in the net being trained more on the "uninteresting" data. A related matter is that of one-time/extraneous/new events that are not desired in the net. Does anyone try excluding these? Is there a way to exclude certain data in NS? I suppose with large outlying data (news/one-time shocks) one could use conditional values to set it to zero or some other approximately median value.

Thanks  
for your  
time Matt

### **Re: Detrending and preprocessing data series**

Date :5/2/2002 10:07:00 AM Poster : Webmaster@ward.net

There is no data sampling, smoothing, or filtering in the normalization unless you use the little check mark "Adjust training set for trending markets by evenly distributing training bars". That sometimes works well, sometimes not. It tries to create a training set with a more even distribution of up moves and down moves. It has been suggested before, and is on our list, to give the user the ability to filter in or out training patterns like news events, perhaps based on some indicators. That assumes you can decide which bars were effected by the news. On the other hand, isn't it true that general news can affect the whole market? Yesterday the resignation of the Sun CEO probably affected the whole tech segment, not just Sun.

On 5/1/2002 4:53:10 PM MattR wrote: I have some questions about data preprocessing in NS that is mostly handled internally. Can you shed any light on how data is adjusted? Does it smooth data automatically (averaging)? I assume it isn't automatically adjusted to a percentage change/log percentage change as there are both price and percentage change choices? Are there any variance/standard deviation adjustments, automatically included? (more on this) I assume no sampling/filtering is included? (more on this as well)

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Thanks for your time Matt

**Re: Detrending and preprocessing data series**

Date :5/2/2002 10:27:40 AM Poster : Steve Ward

To what the Webmaster said, I might add that by their very nature, neural nets smooth data as long as you don't give them too many hidden neurons. To understand this, think about what happens when you use zero hidden neurons. You get a linear model - meaning you are fitting a straight line or plane through the data. Sure, outliers affect the angle of the line or plane, but linear models are pretty smoothed, aren't they? The more hiddens that are allowed, the more each little bump gets fit. But detrending by using percent change, etc, on both inputs and outputs I think is important. Many of the standard indicators detrend and even normalize by virtue of what they do. It is possible, I think, to worry excessively about smoothing. Of course, differing opinions are more than welcome here, and we'd like to hear them.

**Re: Detrending and preprocessing data series**

Date :5/1/2002 7:46:11 PM Poster : Jacobs

I may have missed this but why is this normalization not done with the Adaptive Net indicators? Why are they special?

/Jacobs

**Re: Detrending and preprocessing data series**

Date :5/2/2002 10:17:22 AM Poster : Steve Ward

The Adaptive Net Indicators do work quite differently than most nets. Some feel they aren't nets at all. Unlike other nets, they don't need data in small ranges (which is the main reason nets need normalization) because they do pattern recognition by comparing. The

help file suggests using the Z-score indicator if you feel you have variables that are not in the same range, although to a limited extent the "contribution" factors do smoothing and range reduction. At some future time we may make normalization an option for ANI.

### **Possible directions to explore with NST**

Date :4/30/2002 9:20:23 AM Poster : Dan Kinter I am a newbie to NST. I have done all of background studying and now am ready to begin my quest. I am very aware of the following:

(a) there are MANY, MANY ways to go about this quest with NST (I own all the add-ons except DataX which is too complex for me)

(b) you guys/gals have worked extremely hard to develop your own systems which, of course, must be protected However, perhaps you could give me some suggestions as to what general routes of exploration you have found fruitful (I'm only speaking in the most general of ideas to explore). For example, one path might be:

(1) pick out moments in time in your particular product's chart that you KNOW are critical to the product's immediate directional movement and then experiment with NST to find indicators which express that particular market's dynamics at that time and then use the Fuzzy add-on to "photograph" that moment in time and then build a system which "recognizes" those dynamics the next time they occur. Such an approach might be described as basically marking "moments", using the optimization features to find significant indicators, and then using Fuzzy to "photograph" that moment and then recognize it when it occurs again. Another path might be,

(2) focus on the Prediction Wizard to build a system by incorporating various predictions into indicators which are then used in the Trading Strategy Wizard to develop a system. I am just looking some general directions which some of you have found fruitful without giving away and "work product secrets". I am certain that many of you have used NST in very, very different ways and perhaps you might give a "newbie" a hint as to what are some good directions to take. Thanks in advance for any help. Dan

### **Re: Possible directions to explore with NST**

Date :4/30/2002 1:47:58 PM Poster : Steve Kratochvil Well, Dan the first question you need to answer is. Are you going to Day Trade? This is based on how much time and money you have to throw at the problem. If you are going to Invest or Swing Trade then you can use your evenings and start with 5K. Day Trading requires full time and 30K to start. The next thing you need to do is fully understand your indicators. Study the Fuzzy Logic indicators and what they can do and cannot do. They can interpret your other indicators little nuances where otherwise you only have crossover points and penetration lines or levels to signal you.

Steve

### **Re: Possible directions to explore with NST**

Date :5/1/2002 10:27:12 AM Poster : Dan Kinter

Steve -I apologize for not being clearer. My goal is to develop a day trading system which uses very short time frames (1-3 minutes) but which attempts to find repeating "creme de la creme" patterns within the ES, NQ and/or QQQ products which, in the futures world, produce small profits but which, in the financial world, add up to enormous profits (like 10.0% net, net return per month - this translates into an average of approximately 1-2 net, net points per day in these futures markets). I have the time and patience to seriously attack this puzzle. Again, I appreciate your

help.

**Re: Possible directions to explore with NST**

Date :5/1/2002 4:04:23 PM Poster : Jimmy Raineri  
Dan,

IMO, you don't really need to find any 'creme de la creme" patterns in order to do what you are talking about. You can net nearly 5% per day on 1 ES point trading with a broker who allows you 25% margin during the day. Using a short period chart (preferably tick based) and something simple like stochastics, you can usually have that point in the first 15 minutes after the market opens and be done for the day.

I have a similar view of trading -I want to be in the market for as little time as possible, and I exit based on my preset point profit instead of using an indicator to exit. May seem silly, but popping off 10 one point trades per day is a whole lot easier than make 2- 5 point trades. You don't have to be in the trade for longer than a couple of minutes usually, and it is far less stressful. Sure, you will pay more commissions - but the reduction in risk is well worth it.

**Re: Possible directions to explore with NST**

Date :5/2/2002 1:02:34 PM Poster : Jimmy Raineri  
Let me add one more thing to my comments

Don't let yourself get stuck into thinking that minute based charts are the best way to go. Unfortunately, you NSTrader can't deal with these, but I've found that constant tick based charts are FAR better in every area. You would be suprised what a difference they make - indicators are almost naturally smoother, and for emini futures contracts, you almost dont even need any indicators if you choose a bar size of a certain number of ticks.

**Re: Possible directions to explore with NST**

Date :5/2/2002 4:01:13 PM Poster : Maxwell Craven

Please permit me to express an opposite opinion. I think that applying standard indicators built for even time-sized bars is somewhat misleading at best. They may look smooth, but they may not relay the correct information. Many of these indicators are based upon concepts like averages over n periods. If you suddenly have a great volume of ticks in a very short period of time, the periods get squeezed in time. Your indicator essentially becomes an exponential indicator, and exponential ones become even more skewed. Worse, you never know whether things are skewed at the beginning, middle, or end. You'd be reduced to consulting the volume for an interpretation of your indicators.

**Re: Possible directions to explore with NST**

Date :5/2/2002 9:16:34 PM Poster : Jimmy Raineri  
Hi Maxwell,

I'm not sure I fully understand what you are saying. IMO, whatever indicator you choose to apply to whatever type of bar always relays the correct information. You may interpret this information differently, but it is nontheless correct. I have yet to

read anything that explains why time based bars are better than anything else.

An indicator that uses X over N periods should work just as well with minute based periods or tick based periods. As long as each period is a the same fixed length of "something" it shouldn't matter at all what that something is.

I don't understand your point about having a greater number of ticks in a short period of time -because IMO this is one area where tick charts provide a huge benefit. Take, for example, an indicator that uses the bar close as it's input, like most indicators do. If you are using a 3 minute chart, for example, there might be heavy buying on the ES contract that causes ES to run up 6 points over a three minute period. Since your indicator is only calculated every 3 minutes, when the bar closes, you may get a signal from your indicator (say a stochastic crossover) as it gets recalculated - however, you just missed the major part of the move. And the same really applies for 2 or 1 minute charts - you will miss any quick and big point move waiting for your minute or two minutes to be up.

On a tick based chart, you will more than likely have, for example, six or seven bars generated over that same three minute period -and your signal will surely come far earlier than any time based period could provide.

There is no magic in time based bars. A bar could close at 1000.25 causing a indicator to signal, or if that 1000.25 trade came through 1 second later it might close at 1000.00, giving you no signal, and causing the next bar to open at 1000.25. Time based bars are almost useless

after hour because your indicators are effectively flattened because of little price movement within the period chosen. Tick based bars look and feel exactly the same during after hours as they do during normal hours.

IMO, indicators are just that - something to indicate something. To me, it doesn't matter what they were designed to do, or how they are "supposed" to be used - everyone uses and interprets indicators the way the books say you are supposed to. Discovering non-standard ways to use the tools available will give someone a substantial edge.

**Re: Possible directions to explore with NST**

Date :6/4/2002 5:28:39 PM Poster : Jeff Kilinski

Be aware that EVERY trader on the floor of the merc and EVERY trader off the floor in the Merc building is using the 1 minute chart. They are ALL looking at the same levels. Using different time periods or a tick based chart as Jimmy describes is a good idea.

jeff

**Re: Possible directions to explore with NST**

Date :6/5/2002 9:37:53 AM Poster : chris wong

im not sure i understand the logic of wanting a different time period than the brokers are seeing. can you please elaborate on why looking at a different representation gives an advantage? my first thought was, sure i need to see a different bar than they do. then after thinking about it i wondered why - if i want to outsmart them shouldnt i see what they are basing their game plan on?

**Re: Possible directions to explore with NST**

Date :6/5/2002 11:19:58 AM Poster : Jeff Kilinski

My comment was meant only as a notice that the floor traders are focused on the 1 minute bar and using other tactics might help. Agreed, if you want to outsmart them you should be aware of what they are looking at. Watch it enough and you see their patterns.

jeff

**Re: Possible directions to explore with NST**

Date :5/1/2002 8:27:57 PM Poster : Steve Kratochvil Excellent choice. I am a 1 min man as well. The first thing that you NEED, now that you have all the indicators, is the TEMA9. I have sent up the tpl for it a few times. I will send it again. This allows you to smooth out a data series without noticing the lag. I replace almost all of my Close time series inputs with the TEMA9 and avoid all of the jitters in the close. I have based all of my successful work on the TEMA9. I know this will help.

I have found several consistent generalized patterns in stocks. With pattern research you can hit the 100% success zone. I am in the middle of fine-tuning some daily patterns that I will use to guide my other indicators.

Steve

## NSDT Advice

Date :5/5/2002 4:59:20 PM Poster : Steve Kratochvil

If you are looking for some advice about NSDT, here is my attempt to be profound.

First, there are limits to NSDT and your computer. You will be working toward squeezing the most out of everything. The amount of RAM and CPU you have will directly affect how many indicators and what type of indicators you will use. Different indicators incur different calculation weights during the day. These weights are different during the day than after hours. So get a feel for the heavy ones and determine their value for your system. If they cannot finish their calculation in time for the next bar they are not even tradable. You need to see waiting for price ticks flash in the status bar on every bar to know that you are good to go.

Second, you will need to get a feel for how big your file can grow before it becomes unmanageable. After you have some quality work, save a copy of the work file some where and return to your work, then delete out all the build indicators that you used getting to the results and then continue from there. I have to keep my files under 1MB for optimum performance. The reasonable limit size of your file is directly controlled by how much RAM you have and the indicators you are using. The weight of the indicators really stands out when you add more time series data or run Trading System back test.

Third, Optimizations need to be scheduled on a test plan and run at night while your sleep. In addition your nets are only as good as your indicators. If you can't see it, neither can the net. If an indicator does not exist, the net will not make it up for you with some stroke of genius. So your optimization needs to be based on solid indicators that have at least an 80% success rate even if it is not profitable. Optimizations for indicators need to be trying to achieve the Winners – Losers. The net can take these good solid indicators and draw correlations similar to how you would (had you been watching) and try to achieve the goal of Net Profit. A good system (80% success rate) can be made profitable and has the ability to translate to other stocks and time frames. A strictly profitable system does not. It will be confined to the specific market conditions and fail over time. This is where most "Black Box" systems come from. Once you have your indicators that seem to survive trial and error, lock them down by saving them as tpl's with all of the settings hidden in the advanced area. Do this before you feed them into your nets for optimization. You want to do this because you want the net to optimize on the good indicators that are based on sound logic. The net can then leverage this good info to make better decisions. The point being, your brain can out perform a neural net every day of the week, but your brain with a neural net assistant can smoke everyone else consistently. Note: You can only save indicators as tpl's if you purchased the NeuroShell Day Trader (NSDT). I cannot stress enough that you need all the best tools. If you don't have all the Add-on Nets your going to miss some of the most powerful indicators made to date.

Fourth, Price and Volume. Set up a collection of indicators that cover these individually as well as together. Try to avoid arbitrary penetration lines and other mathematical lines in the sand unless they are part of a BOUND indicator. Stick with generalized indicators that use percentages or shapes that can be formed correctly no matter where the price or volume go. Understand your indicators. Understand the logic and theory behind why they are built the way they are to be used. When you are building your own indicators write down why you built them. Log your progress. I am fortunate enough to be able to keep a lot of things in my head, but I cannot keep them all in the



front at one time. I note my work for myself. If you are a day trader then the Price is the leading indicator that you need to follow and Volume is the strength of the commitment to that price. The news, the psychology, the fundamentals, the market professionals, and you are all represented in these two things. You need only build indicators that focus on these things. If you do not have price movement and volume surges in your stock then it is not being traded and you will not make any money. Chose stocks that have a heart beat (Large Price Movement) and enough liquidity (High Average Volume) to get in and out when you desire. I use TC2000 to scan for a list of day tradable stocks that I review in NSDT. If you do not have TC2000 you need it. You can find great stocks fast, that NSDT can really use and make money with.

I close this post by saying; "These are the best general pieces of guidance that I can pass along to anyone that have made me money." When faced with a great tool like NSDT, that allows almost everything to be changed, (There are a few things I wish I could change that are not open to a data series.) you should not quaffel on which direction to go with anything you build. If you are stuck as to how to make an indicator work, then put in the extremes and see what it does. This should give you a great idea about what values in the middle of the extremes might do or how they may be interpreted. Also post your question on the forum, and be VERY SPECIFIC. If after that and the indicator does not communicate to you any meaningful information, chuck it out and move on.

I hope this helps and I can empathize with everyone who feels lost in NSDT. Just to let you know it does get better with practice and financially profitable with persistence.

Steve

### **Re: NSDT Advice**

Date :5/7/2002 1:32:14 PM Poster : Stewart Hi Steve, First of all, thanks for the pointers. I have some specific questions, so here it goes..... I know there have been several threads around preventing the optimization of specific indicator parameters such as hiding them by creating a custom formula. One of the things I've noticed about optimization is that one of the causes of over-optimization seems to be a result of entry and exits ending up with different values. Has anyone found a way to keep the parameters in sync? Optimization -Suppose you have a day strategy with a prediction and some indicators. How often do you optimize the prediction? How often do you optimize the strategy itself? Over-optimization - Help! I've found it is easy to come up with strategies that provide good returns, but most of the time, they end up being over-optimized. I've tried increasing the number of bars, lowering the number of hidden neurons, and not letting NSDT finish optimizing (which I don't like because you can't always replicate the results if you happen to be sucessful. -Any ideas of how to improve? Implementation of Daytrading Strategy - Once you have a strategy that you feel will be successful based on your testing, how do you implement it? You sit at the computer waiting for the signals? Do you use the continuation of a sucessful backtest as the starting point or do you start over? I'd really appreciate any advice you or others could give. Thanks, Stewart

### **Re: NSDT Advice**

Date :5/7/2002 11:14:13 PM Poster : Steve Kratochvil

Well, Stewart. Here it is. I have tried to answer each of your paragraphs in order.

Your first issue, I am assuming stems from the way the resulting trades are executed. This is how it happens. The very bar that the signal happens on gets a blue or red Marker. The trade execution happens following the signal at the close of the next bar. You could not have executed during the bar that created the signal because the signal does not exist until the bar is given a close. And for probability sake the close of the next bar would be a satisfactory value to represent your more than likely actual entry price, which is different than the signal price.

I optimize decisively. I know what the optimization should produce before it does. I am not trying to let it guess around for the best fit in a vacuum of infinite possibilities. I would not optimize more than once for the first fit and then only if the Trading Strategy started to fail. But at failure I would evaluate the trades that failed before I started optimizing like crazy. I have also not found a lot of value in re-optimizing. Once I get it set it comes out the same even after several optimization. The optimizer is phenomenal and I have not found a need to use it every day. If you do I would be very suspect of the inputs that you are using. They are more than likely too vague and broad in there scope. Clear up the vision of your system. Simplify down to the core pieces of the most complex system you can create. Give the optimization things that it can work with that are based on solid logic. If the optimizer gets over in left field somewhere, that is because it can and you have not roped it in to the problem at hand. You need to focus your optimizer. Try starting out with Boolean inputs and get the hang of it until you can expand the BOUNDS of the indicators used in your system.

As for your over-optimization. Stop. The optimizer is not going to just cough up a golden egg one day. I have tried that many times. I have run the optimizer into the ground. Think about what it is trying to do. If you look at your results from time to time you might be illuminated to see that optimizer try's values that are outside the bounds of the indicators given that these values would not work it would be safe to assume that they will not be the best choice. Now if they do end up as part of the solution then you have not presented the optimizer with an accurate picture and things are a bit blurry for it and it guess the best it can. As for re-optimizations not giving you the same results. I have experienced a lot of that too. Now it hits the same results every time no matter how many times I optimize. The best way for you to improve is decide on exploring the one way to trade stocks and build indicators that represent that and truly support your theory. Then run optimizations on the different indicators to see if there might be some improvement within the settings of the indicator. If not you have them set correctly and need to move on to adding them to nets. Then optimize the nets with your locked down indicators. They are locked down because you know that much is correct and must not change.

I back testing and implementing are two separate steps. I back test like crazy. I have even sent two charts the crashed during back testing to ward systems for their review. I back test everything. When an indicator has an 80% success rate or better in the back test I then move on it. I take these indicators and try to work with them in nets, which are also back tested. If I am satisfied with the results then I trade it. This weekend I decided to change stocks. One thing that you

must really drive into your head is, that your indicators need to transcend stocks, sectors and markets. There are so many personalities in stocks out there, that if you try and niche up on one, you will not do well when that sector falls out of favor with the market. You must focus on the basic elements of a stock, which they all have in common. They only have three choices, go up, go down or remain the same. All stocks only do these three things and they only produce two types of information, price and volume. So once I am locked in I trade, and by the way I chose a different stock and just changed out the symbol on the chart and traded away today. I made a bit over \$1000 by 10:30 so I walked away. I must confess that is not a lot but, I will be checking to make sure that I have a good fit in the morning and keep on driving.

The actual implementation is accomplished with an application that I wrote called AutoPilot and the DataX Add-on. The DataX passes the signals to the AutoPilot, which executes the orders. That is it.

Long and short of it: NSDT is hard hard work and worth it.

I hope this helps,

Steve

**Re: NSDT Advice**

Date :5/8/2002 2:43:52 PM Poster : vince

Hi Steve K.

Does your Auto Pilot work with any Order Entry program or only with a specific one?

Thanks

Vince

**Re: NSDT Advice**

Date :5/10/2002 7:44:15 AM Poster : Steve Kratochvil

I assume you mean Broker. I have it setup to send orders to DATEK. If you mean the GUI that different brokers send to you, sell to you or lease to you for order execution, AutoPilot replaces them.

Steve

**Re: NSDT Advice**

Date :5/13/2002 9:37:07 AM Poster : Vince

Yes that is what I meant. I use a platform called Redi. ([www.redi.com](http://www.redi.com)) What I will like to do is have NSDT send Buy/Sell orders directly to Redi when they occur.

Thanks

**Re: NSDT Advice**

Date :5/13/2002 2:54:02 PM Poster : Steve Kratochvil

Well, REDI has it's proprietary "UI" and they seem to be very proud of it. If they have an online order entry screen back in the customer area then it is a very easy task to send the HTML order. If all orders only come through their UI then it is a very difficult task and the exact method that they use to send the orders

is unknown.

I have employed several technologies in one package to be flexible to adapt to the constant changes that brokers make and also in the event I change brokers or add a broker. I used VB6 as my platform and integrated JavaScript into it. The JavaScript does all of my HTML work inside the VB6 app. I even have a dash of VBScript thrown in for regular expression work on HTML fragments from the JavaScript. The DataX is of course the way that I am sending out the signal. To the AutoPilot.

Steve

**Re: NSDT Advice**

Date :5/14/2002 10:37:28 AM Poster : Vince

Thanks for your prompt reply Steve. And yes Redi also has an on-line order entry screen. Any suggestion on how to do it?

Thanks

Vince

**Re: NSDT Advice**

Date :5/14/2002 5:33:19 PM Poster : Steve Kratochvil

Look at the post by Matt. That will get you started.

Steve

**Re: NSDT Advice**

Date :5/13/2002 10:41:52 PM Poster : jk

Steve,

Would you be willing to sell your DATEK order routing code ??? I would think many of us would find it useful and worth \$\$\$\$ not to have to sit in front of the tube. You got one buyer already-I will bet there are more. You help the "cause" by requiring the DataX add-on so the Ward folks should see no conflict.

Sell it as is... As a past Tradestation user, I am used to no support.

Hope you take Paypal ????

Best regards and good luck.

JK

**Re: NSDT Advice**

Date :5/14/2002 11:36:35 AM Poster : Steve Kratochvil

The AutoPilot is not commercial grade in it's present form. What do you think it is worth in dollars to automatically launch orders? I have entertained the idea of trading the AutoPilot for 1min charts that have 80% success rate and are profitable. I hold to all the Ten Commandments except number 9. Also I don't actually break it, I am just bending it. Hahahaha.

1. Thou shalt seek inputs that affect the output.
2. Thou shalt not use too many inputs.
3. Thou shalt not use too few training patterns.

4. Thou shalt choose thy training patterns so that they are not clustered and are a balanced representation of the problem.
5. Thou shalt not judge thy model by its ability to reproduce training patterns.
6. Thou shalt not apply statistical measures and precision to financial modeling.
7. Thou shalt not use too many categories when classifying.
8. Thou shalt not code inputs with monotonic values unless they represent monotonic concepts.
9. Thou shalt not waste time coveting thy neighbor's financial models.
10. Beware of extrapolation of non-linear models.

I don't waste time on it, but I do covet my neighbor's financial models. I think I am going to give in to this one vice and plead human. If there is enough interest in the AutoPilot I might get some of my guys to clean it up a bit. As for support from Tradestation that was funny. If I were to actually undertake the AutoPilot as a product I promise that I will be supporting it as long as I am trading with it. I need it to work as well as anyone else.

Some things to consider about the SEC. If you are trading your own account and developing an automated trading system, you are fine. If you derive revenue from your ATS from other users, or assist other users in executing trades, you must be registered as a broker-dealer. There are exceptions to this, and you can submit a No-Action Relief Letter to the SEC to petition for an exemption from registration of the broker-dealer requirement. NO ATS for options. It is a violation of U.S. option exchange rules to transmit orders that have been created and communicated electronically without any "manual intervention". Thus, it would be a violation of exchange rules for a customer to use an autoquote or similar program that created orders and sent them to an exchange without any action by the customer.

So when I ask, "What do you think it is worth in dollars to automatically launch orders?" one needs to consider the weight of the proposition. I would be willing to file for exemption and talk to Steve Ward again, if the price was right or the charts were good.

I hope this helps,  
Steve

**Re: NSDT Advice**

Date :5/14/2002 4:24:18 PM Poster : Matt R

I am not sure if you have checked or not, but REDI provides multiple and extensive options for direct access. SLK provides access through ActiveX and through FIX. REDI is more of an institutional platform, thus it comes as no surprise that the capabilities are much greater.....see:

<http://www.redi.com/apifix.html>

Matt R.

**Re: NSDT Advice**

Date :5/14/2002 7:52:30 PM Poster : Steve Kratochvil

No, I had not checked into it. That looks very cool. The ActiveX control will save alot

of time given it is built well.

Steve

**Re: NSDT Advice**

Date :5/14/2002 11:30:26 PM Poster : jk

S.K. Thanks for the prompt response. Unfortunately I am not a 1 minute trader-I do not have the time currently to "do" short time frames. Hence the desire for your code ! I am a position trader (30 min. bars/average time in trade 2.5 days) and in particular, at this point a Tradestation user. From a performance perspective I have Tradestation "systems" with a historical sharpe ratio of near 3 (that includes slippage & commish). I too live in the real world. I currently utilize TS2000i's email alert functionality to get me in/out of trades as necessary. I am looking to migrate to NST as it is a better tool for back testing/optimizing (avoiding curve fitting) and of course the nets. However, TS has far superior graphics capabilities. Paint bar studies in particular are great (if this and that then turn a bar green-if you are unfamiliar with TS). Your "how to" detailed in this thread (which I thought was right on by the way) outlines the NEED to feed the net useful stuff and that is usually found by looking at your indicator relative to the price movement and dissecting to determine if the two correlate. Often my idea for an indicator is "close" however, I will miss some opportunities and just be wrong on others. I will then add a bunch of logical AND or OR to my logic to separate the wheat from the chaff. Again, this is very efficient in TS and while possible in NST it seems less intuitive. That subtlety seems minor, but I am a big fan of garbage in- garbage out and I sort alot of garbage.

With that long winded intro- I think the two programs can work synergistically very well. I could barter some of that stuff for the order execution stuff if you have any interest. Trying to answer the question of value of an order execution system..... I presume it is largely a function of how many copies you can sell and how much coding it would take to make it idiot proof. I have no idea how many copies of NST are out there, but if the price was not too painful you could move alot of copies( $500*200=200*500=100,000$ -the question is which one is the number of copies and which one is the price ?). I suppose you may have prompted Ward and co. to add another add-on.

Thanks again and good luck.

JK

**Re: NSDT Advice**

Date :5/11/2002 10:05:43 AM Poster : Stewart

Steve,

Thanks again for the info. I'm trying to re-design my existing systems with your advice in mind.

By the way, I try and stick to core elements of price and volume. I feel like these are the truest indicators and the more complex an indicator is, the farther you are getting from them.

Are the systems you build day systems or swing? I've had much better success with

swing systems so far.

Regards,

Stewart

**Re: NSDT Advice**

Date :5/11/2002 8:31:44 PM Poster : Steve Kratochvil

I apologize for not being clear. I just type this out and post without concerted editing or revision. In my attempt to state concept and theory I used the words core elements. I do not mean that one should remain on the raw data. I reference TEMA as an example. I use it to replace the Close in most inputs. It is a highly effective and complex indicator the holds to the core element of Price. Then when you build off of this you are still inline with Price and things that you apply to study TEMA are going need to follow the same mentality. I am going to evaluate JMA from Jurik soon. They claim that it is better than TEMA. I don't know. TEMA is very solid and may be better for what I am doing. Now indicators that I shun are things give abstract computational points of view that require farther interpretation, and in and of them selves present another data series path that needs indicators to give it meaning. Look for the logic of the indicator's theory to stay close to the Price or Volume. A lot of Oscillators quickly end up on the "do not use" list. This category of indicators has a higher probability of getting away from the stock's price or volume and just blathering about some point of view it might have. So I evaluate them with a large grain of salt. Above all it must say something clearly meaningful and do not write off anything without due diligence. But once you have investigated it and have decided that a particular indicator is not art of the plan. Do not come back to it just because someone is pushing it. Draw your lines in the sand and reach your goal of a profitable system with logical process of elimination.

Also fully understand what any indicator does. If you need behavior like what an SMA can give then AMA is a bad choice. This I especially true if you do not want to hold so close to the data series and need broad stroke ability. Use the indicators for what they are intended and do not polarize on one type. Polarizing has the effect of reducing your indicator vocabulary to one word. Conversely do not pile indicators without deliberate intent and design. Otherwise it is like a crowded room of people all talking at once. You will not make heads or tails out of it.

I am only Day Trading at this time. When my account value exceeds my ability to gainfully employ all of it, I will Swing Trade the portions that I cannot Day Trade with. I have estimated that target value of my account at \$300K to \$400K. Some where in there is what I see as the max amount that I will be able to Day Trade successfully.

Steve

**Re: NSDT Advice**

Date :5/12/2002 10:06:18 PM Poster : Jacobs

Thank you Steve Kratochvil for your many thought-provoking advice.

First, I use NST Pro (EOD data) and I can also save indicators as tpl's but. I can't load an intraday chart for a view.

You proceed in a very methodical way with your Day Trader.

From what you write I get the impresson that you build your indicators that

supports your theory then investigate them one by one and calculate it's success rate(=percent profitable trades)?

If I understand this you are optimizing a single(?) indicator to see if there are some improvements within it's settings. How is this single (if so) indicator optimization carried out? Is it in a Net (Insert/New Prediction...) or a Trading Strategy? What objective function do you use – you have mentioned: Maximize #Winners-#Losers ?

If you decide the indicator is good you save it as a tpl.

When you have a collection of good indicators you put them in a Net (Insert/New Prediction...) , start an optimization for indicators – is this the choice "input selection"? using the objective function: Maximize #Winners-#Losers?

Following this, and maybe the last step, you carefully optimize, with a focus, for Profit in a Net(Insert/New Predictions...)

This is how I understand your last posts. What puzzles me most is, if so- how do you optimize a single indicator? I hope these issues are not too detailed about your work.

Jacobs

### **Re: NSDT Advice**

Date :5/13/2002 11:17:45 AM Poster : Steve Kratochvil

Actually it is very simple. Here is how I work. Given these constants: 1 We are all looking for the peaks and bottoms of price movement. That is the goal of all 100% of traders and trading systems. We can call it the Law of Reversal. 2 All issues travel in one direction at a time and only make two choices with no choice being a third. The price goes up and the price goes down or the price very rarely just remains the same. We can call this the Law of Direction. 3 All issues have an amount of interest at different levels. The volume can be strong and it can be light. Volume can surge, spike and drop off showing the amount of interest in the issue. We can call this the Law of Sentiment.

All indicators attempt to define the Law of Reversal. They rely on the Laws of Direction and Sentiment to do so. So here goes.

I build an indicator. I look at it in comparison to the Law of Reversal. If it looks good and semi reliable over time, I place it into a Trading Strategy and see what it can do all by its self. If it can develop over 80% success rate I am thrilled. More often than not, work is required to adjust it or use it. If the success rate is 40% or less I am concerned about the validity of the nonsense I may have just came up with and I will check to see if I am thinking straight. In working the indicators I limit the amount on time the Trading Strategy will hold that position to about 5 bars or a price target of .25. This way I can get a better picture of how it truly is doing with the Law of Reversal. After applying all the common sense logic setting or theory settings form a book, friend or elsewhere. I also run the optimizer on it looking for Max Winners – Max Losers. I then evaluate the results against the Law of Reversal. Then if an indicators prior strikes me as being helpful to this one, I



might lace them together looking for synergy. Both indicators must be built from the Law of Direction and Law of Sentiment. If I am looking for short, I had better see short entry points. If I am looking for long, I had better see long. Once I am satisfied I make a tpl out of it and send it on to the nets.

Now once I have something that I can rely on I move to the nets and the indicators as an input to a net. I run the nets plain Jane first and see what the net is going to do with it. If it looks exciting I add it to a Trading Strategy and see how it rates. I then run the optimizer to Max Net Profit. I do this because I include slippage of .20 in all of my testing. I am only looking for the real world when it comes to these trades and slippage is real. I know that there are a lot of people that beat draw down into a pulp but it is not part of my trading system. I just have not seen any value in worrying about it. If you are not making any money on your trades it is obvious. As for money management. Never trade more than 2/3 of your margin and if you lose consistently over the last 3 trades, stop trading and evaluate your problem.

I hope this helps,

Steve

### **Integrated -automated trading**

Date :5/15/2002 10:41:35 AM Poster : Steve Ward Just so that everyone knows what Steve K has already known for some time, Ward Systems has already programmed a limited but general purpose integrated trading, which is waiting for a future release, or could become an addon of some sort. It has already worked on one popular broker, but it probably won't work for every online broker. I don't have dates or more details at this time.

If Steve K wants to sell his version, we support that and will help in do so (as we will help anyone wanting to sell an addon to our products, template, etc.), even after ours arrives. After all, he might very well have a better one, and might decide to get it ready sooner. Users can then have a choice. See NST Advice thread for info on what he did. Some definitions might be helpful: INTEGRATED Trading - A product which produces an order from a trading system and asks the user if they want to place an order with their broker (yes/no). If the user chooses yes, then the program places that order with their broker through some means.

AUTOMATED Trading - A product which produces an order from a trading system and places the order with a broker WITHOUT asking the user if they want to place an order. An integrated trading system would require a user to monitor the computer all day and verify all orders before they are sent. An automated trading system would place trades while a user is out playing golf. What we have programmed is integrated trading. Obviously it could easily be turned into an automated trading system by simply not displaying a message box. However, we aren't a broker/dealer (see Steve K's comment on that), and have not investigated what is required to become one.

I certainly see the appeal of an automated trading system, but using one would take real guts unless you have a system that has worked pretty reliably for a long time. You'd

better be pretty sure of it. Others have told me they are programming automated trading, not for resale but for their own purposes to specific broker interfaces. That's actually why we built the Data Exchange add-on. It really isn't all that hard on our end, given the example we provide. The interface to the broker may indeed be hard. The main problem on our end, a limitation of the Trader's interface, is that it can't easily tell you which stock is to be traded unless you put each stock in a different chart. I hope in a future release we will be able to pass the ticker symbol, or at least a subchart number, making DataX altogether more useful. In the mean time, there are some primitive ways to discover the ticker symbol, like comparing the price of the first bar in the chart to the known first prices of all of the tickers in the chart (see the tip "How to build hedging trading strategies" for an indicator that will do that.)

**Re: Integrated - automated trading**

Date :5/15/2002 12:30:06 PM Poster : Steve Kratochvil All true. So here is what I am going to do. I am going to try and give Steve Ward a call and discuss my thoughts on this. Steve

**Re: Integrated - automated trading**

Date :5/15/2002 8:12:09 PM Poster : jk Good news on all fronts. As NST works only with Quote.com data it would not be unnatural for the interactive version to work only with Datek or ??????. I have done various experiments (before the open and simultaneous phone calls with various brokerages) 6 mo. ago to determine who has the best fills. I found Ameritrade to be the BEST by only fractions (1/16 of a point over the rest who were all very very close). So in my opinion an E-broker is an E-broker. This was recently confirmed in the latest issue of Forbes. On the Integrated vs. Automated side...

1) I know lots of disgruntled TradeStation traders who might switch to NST if something like this was made available. The TS traders have been absolutely abused by buggy product and NO support. These traders have been ripped off by Omega Research and are HIGHLY suspect of their trading/brokerage system TS6. I could go on and on about the Omega research issues, but that is not the point. There is a huge untapped customer base for a solid player.

2) It seems like some redundant work is going on (automated order entry) with no synergy. I would think these efforts are better off towards a community sharing ideas on systems/philosophies/books etc etc. I must say the Omega Discussion Group is a VERY lively crew with some talented contributors. JMA vs. triple smoothed moving average were compared years ago with plots etc etc.

I do not underestimate the significance of the legal issues. However, it seems that there might be some simple ways to get around the most obvious issues. I would think that all Open orders might REQUIRE a simultaneous close order (dollars or % change or price target) as a safety net in the event the trading computer goes down/heart attack etc etc. Again, Omega Research HAS automated trading capability they are simply not credible. However, they have lawyers too so that would make the boiler plate readily available-copy/paste.

In conclusion- I want the automated trading system.....so do others. Why wait for Omega Research to become credible or be the only game in town ? Obviously an

automated system is close .....finish it (anybody) before somebody else takes the money off the table.

Regards, JK

**Re: Integrated - automated trading**

Date :5/16/2002 1:28:55 PM Poster : Jimmy Raineri

Seems to me that any automated trading system is going to only be as good as it's data feed. Not only the accuracy of the data - slow or bad ticks, but the connection itself. Can't imagine depending on Quote.com for much of anything in the way of accuracy or connectivity.

**Re: Integrated - automated trading**

Date :5/16/2002 5:14:17 PM Poster : zawie I've thought about this many a time, and I'm soon to embark on developing my own automated trading interface. (And I won't be selling it because of liability) My main concern (which applies to all automated trading systems), is reliability. No brokerage or quote system, internet connection or PC is 100% reliable. Even neuroshell can (and does) crash, windows will give the blue screen of death. I.E. There are a lot of variables (and a lot of liability). Any point can fail, but there are moves you can make to reduce the possibility. Duplicate PC's, duplicate ISPs, running a reliable OS. If you're trading stocks and can place stop orders, then that removes a considerable amount of the risk, but not everything. The solution I'm planning to the problem is: Order Processing: Order processing happens on a unix machine (due to reliability). If the order fails for any reason, I get paged. The unix machine sends out a heartbeat every hour or so. Every trade is paged. The program on the unix system, listens for incoming trades from the PC running neuroshell and acts accordingly. Equity Management: The unix program maintains an equity curve. If there is any abnormal deviation from this curve, all trading is shutdown pending operator intervention. There is a trading activity limit in effect, which will shutdown the system if too much trading is happening. Testing: Test, test and retest. Fault monitoring is critical. And finally, test again. Them my thoughts. Mark

**Re: Integrated - automated trading**

Date :5/17/2002 8:53:37 AM Poster : Steve Ward Steve K has decided that he will offer custom programming services for NeuroShell users, which might include programming for automated trading, as I understand him. But talk to him directly. We will be making the announcement for him on our newsletter due out today, and will also hang his shingle in the add-ons section of Neuroshell.com, as well as the Custom programming section of ward.net.

**Re: Integrated - automated trading**

Date :5/17/2002 1:05:23 PM Poster : Steve Kratochvil Steve Ward and I have kicked this idea around a bit and I like it. I also feel that it will solve any of the legal concerns regarding automated systems. To that end I am employing my company Ontologic Systems to provide custom development services to NeuroShell customers. I think this will help tremendously. Steve

**Re: Integrated - automated trading**

Date :6/8/2002 5:59:30 AM Poster : Bruno It is relatively easy to access the InteractiveBrokers.com API from Excel or C++ Considering that DataX can be interfaced to Excel or VB (a free sample Excel add-on is available on my ForeTrade.com website), building an automated trading system is quite possible.

Bruno

**Re: Integrated - automated trading**

Date :6/8/2002 1:44:02 PM Poster : Steve Kratochvil Very true, an API saves alot of work if it is well put together. Ward also included a VC++ example in their DataX Add-on. Most of the brokers out there have an API interface now for their systems. The subject of the post you replied too was the delicate legal aspects of a truly automated system, which far outweigh the simplicity of the act of launching the order automatically. I hope this helps,  
Steve

### **Ditto programming language and money management**

Date :5/17/2002 12:26:41 PM Poster : fhealy

I would like to echo the previous sentiment that including a programming language and enhanced money management features in NST would be an excellent idea. I have noticed that in at least one other case, a software product used in stock trading has a built in capability to convert EasyLanguage code into their version of a programming language. For Tradestation users like myself who are looking to fully convert to NST this would help quite a bit. As for money management, one simple step that would help is to include additional information in the Alert window, such as the number of shares bought or sold for each alert.

### **A dissent re: programming language and money management**

Date :5/20/2002 4:06:16 PM Poster : Steve in California Thought I'd express a different opinion on the benefit of a "programming language" for NST and agreement on the need for more on money management.

IMO, one not-mentioned-often benefit of NST is the fact that using the tool takes the focus off "programming" and puts it on trading concepts, indicator construction, and indicator evaluation. "Control" of evaluating trading strategy rules is done by NST; something that in a programming language like EL one must do oneself. It seems to me that it would be a very significant effort to integrate a "procedural language" compiler into NST that worked alongside or in conjunction with its current non-procedural strategy specification wizard. (If I had a vote) I'd vote against spending precious resources on development or integration of a programming language for NST. That being said, what's needed, IMHO, is a more sophisticated (but still non-procedural) approach and interface in the trading strategy wizard. One that allowed for the specification of more sophisticated exit techniques (partial position exists, etc.). It would be great too if the trading statistics included Sweeney's MAE and MFE.

### **Re: A dissent re: programming language and money management**

Date :5/20/2002 10:03:33 PM Poster : Steve Kratochvil I agree with both comments. The indicator wizard needs to be reworked and NeuroShell needs a language of it's own. Here is a list of things that I sent to Steve Ward one day. He asked so I sent. NeuroShell Day Trader improvements. 1 Settings link feature that allows the parameters of different indicators to link to a single parameter entry and mirror the value. This needs to be supported in the optimizer as well. This might also be an extension of variable use and ability from a language. 2 Produce the exact optimized parameter settings for a Re-named input in the final report. 3 Allow the Trading strategy to optimized the synchronized logical common sense pattern of Long and Short trades for all trading styles. 4 Allow the option for priority of trade to be set entry, exit or stops. 5 Developing a BASIC / Trade Expression Language for NeuroShell.

1. Graphing of the grid of prices and/or time across the chart in lite gray color.
2. Arrange the Insert Existing Data/Calculations window popup in alphabetical order. Make this into a menu picker on the right as part of the Snapshot View that will allow you to just pick current indicators and drag them to the chart rather than Hide/Unhide Data... or allow you to drag indicators off the chart.

3. Place the name of each indicator in the chart window associated with it and expand the top portion for more chart area.
4. Allow the size of each chart area to be adjusted by dragging up or down.
5. Allow more than 6 charts.
6. Clean up the set focus event on the top tool bar so that clicking twice is not required.
7. Allow for more colors in the color bar.
8. For nets build plot points by clicking on the Trading Strategy and marking all the desired trade locations known that the optimizer should try to achieve using the inputs. This feature could be called "Guided Optimization".
9. Trading Strategy performance improvements. This seems to be a weak area and needs to be reviewed for what can be done.
10. Allow cut and paste of indicator formula. This should include the results of an optimized indicator. Or allow it to be created as a new indicator.
11. Improved graphics for the overlay of one indicator on top of another that would keep all indicator signals present and visible as the scale of the chart zoomed out to larger time frames in the window.
12. Overall a more user friendly, intuitive, visual experience for the user would enhance NeuroShell in ways that could set it apart as the only product to own. I now have some more, not to diminish the importance of list mentioned above.
13. Allow stocks to overlay inside a chart and allow linking of charts
14. The slippage setting needs to reposition the entry and exit values rather than adjust profit computation for a more accurate representation of market activity. This would in turn be information used by the optimizer.
15. Trend lines. The ability to draw straight trend lines on the screen with an indicator

There will always be more, just give me time. So with that in mind, I set out to take what I do have and make it work. I will not stop prodding or poking at desired improvements. I must say that the M3 data server was one of the best moves yet. Kudos to Ward Systems. To this end I am conceptualizing a NeuroShell Indicator/Language Wizard. I think I would do it this way. I would take a script language and modify it for NS wrap it in a redesigned indicator wizard GUI to build tpl's. I would then have it squirt out .bas files that it would compile into the dll's and place them in production. Compiled code is a must. I would even approach it like VBA or macros in Excel, only with the ability to compile and with a bit more on the GUI side. This is just the first concept that could be done leveraging the current system. I am still thinking. I truncated this message because I found myself brain storming from here to page 3. I understand both schools of thought and agree with them both.

Steve

**Re: A dissent re: programming language and money management**

Date :6/21/2002 5:45:40 AM Poster : Matt Schulz Excellent list. If I may add a small item to the list of possible improvements with regard to money/trade management: Add the ability to select a rounded (up/down) number of shares to the "Buy fixed dollar amount of shares" and "Buy as many shares as possible . . .", to the Trading Strategy Parameters/General window, and to any other future

related trade size selection parameter, i.e., 10, 100, 1000 share lot sizes, etc.. It may or may not make an appreciable difference in strategy optimization but I'd like to see optimizations that reflect round lot trading

**Re: A dissent re: programming language and money management**

Date :6/21/2002 5:32:19 PM Poster : Stewart Well, as long as this is turning into a wish list.... How about multiple time periods in a chart, number of bars/value since condition true, TSF, and Peak and Trough indicators, faster optimizing, the ability to save predictions/strategies for use in other charts, the ability to compare the rules and results of various strategies/predictions, scanning, and mechanical trading....S

**Re: A dissent re: programming language and money management**

Date :6/21/2002 7:10:55 PM Poster : Maciej

Excellent though the wish lists are, they are likley to require considerable resources to implement. I'd personally settle for a less ambitious list as follows:

a) multiple time frames (I beleive that this may have been mentioned before) b) Open Interest values when using quote.com / also the ability to get overnight sessions from quote.com. c) A mechanism to better handle futures contracts - ie automatically pick up the next contract for a given commodity. d) Give Alerts similar features to Indicators enabling them to be saved. e) Making protective stops as explicit in their presentation as exits. f) Allowing re-iterations when optimizing to be refined by setting an increment value. This should speed up the optimization process considerably. As an example when seeking the best value for a protective stop via the optimizer one could give for a grain commodity such as beans and increment value of 0.25 covering a range of say 2 to 50. It makes no sense to analyse and recommend an optimized trailing stop of 3.33 - it just leaves one with an additional decision whether this means 3.25 or should it be 3.50. g) Again in the speed improvement area - I'd like to see the ability of NST to exploit multi-cpu machines perhaps multi machines via some sort of RPC mechanism. It seems fairly evident from studying the performance statistics of NST running under W2K that tweaking in this area could give useful improvements in performance. h) An ability to create run-time modules so that a locked "production" chart could be used for trading separately from a development NST.

I guess that's all for the time being - it would be nice if Steve Ward could share his vision of future releases iof NST - is that possible?

**Re: A dissent re: programming language and money management**

Date :6/27/2002 7:50:54 AM Poster : Steve Ward >I guess that's all for the time being - it would be nice if Steve Ward could >share his vision of future releases iof NST - is that possible?

Ok, I can share the short term. We have a new release coming out hopefully before the end of the summer which has a number of substantial improvements that people have asked for, several on your list. It is already programmed and undergoing alpha testing by the programmers. After that? There's no way we can hope to provide ALL of the features people want in a short time, unless you guys start helping us sell a lot more software by spreading the word about us (people believe other users more than they believe our ads or our salespeople). But we'll keep taking your suggestions and implement as much as we can.

The most often requested feature is another real time choice, which we should have.

There'll be better charting and faster optimization, the ability to add tickers without making .lst files, and more. Some of the features will make it easier to use for newcomers without detracting from the power (remember, our continued profitability means attracting and holding new users). Those same features should make some of our older users more aware of what we ALREADY have in the package, which is a major problem for us right now. Along with making the features easier to use and notice, we may have to do a better job of education. Take your #30 in the list for example. Genetic algorithms don't go through values by increments like ordinary optimizers do. They jump all around. There'll be a chance to beta test this big new release. Watch this site for news of that.

**Re: A dissent re: programming language and money management**

Date :6/28/2002 5:52:42 PM Poster : Maciej Thanks Steve for giving us a hint of goodies to come in the short term. I for one agree with you that more/better education is necessary to extract more lverage from NSDT which by comparison to other software is very sophisticated. Inevitably few if any of us use all of the available features. I for one must admit that I'm finding out new nooks and crannies of NSDT on a regular basis. However, whilst not disputing your assertion that genetic algorithms don't work in the same way as standard iterative do loops, what is being suggested by the enchancement #30 is whether a touch of genetic manipulation might not be appropriate to forstall the ga's evolution in blind directions, ie keep the good part just protect it from some of the possible but unworkable solutions. To take an example from programming, recursive routines in a programming language allow for the elegant expression of a common solution to a programming problem but in practice developpers often circumscribe such routines to avoid stack overflows and other errors. If my memory serves me, Ward used to sell DSP boards or such like to help speed up the software. I doubt that that is a direction that should be revisted but any enchancemnet that helps speed up the genetic algorithm would be welcome.

**Re: A dissent re: programming language and money management**

Date :7/2/2002 11:22:48 AM Poster : Steve Ward

It really isn't the GA which is slow. It is doing a pretty good job when you consider the dimensionality of the search spaces it has to work in when you give it a big bunch of indicators and parameters. It already does some local searching with small mutations of varying size. Increments aren't really an issue here. The problem is the time it takes to run through the data and compute profit thousands of times, especially if you are using any of the indicators that begin with "Trading Strategy:". Now in the coming release, we have sped those up somewhat, but even with that if you load up the GA too much, it's going to take a lot of time. The other indicators are already highly optimized for speed. The only good answer is parallel processing on several computers, which you have on the list. Until then try to use judgment about how much you throw at the GA, including keeping the number of bars reasonable.

Here are some tips I suggest everyone study:



When Optimization is Really Slow Speeding up Overnight Optimization  
NeuroShell Trader Batch Processing Capability

**Re: A dissent re: programming language and money management**

Date :5/26/2002 12:01:03 PM Poster : mike

i concur about refining things for partial exit and entry. let's face it, in the real world traders such as myself leg in and out of positions routinely; how else would you do it. the concept of an all sell or all buy signal just doesn't fit with my trading, so an improvement here would be welcome.

**Re: A dissent re: programming language and money management**

Date :5/27/2002 7:35:43 AM Poster : Steve Ward

We aren't opposed to building some sort of trading strategy or neural net that allows partial exit and entry. However, prior to having a complete portfolio optimization system built in that reallocates funds amongst issues in your portfolio, it might not be as easy as you might think in the current system. Each user would need to specify some sort of indicator that tells the optimizer how to do partial entry and exit while it is optimizing, backtesting, and walk-forward testing. It should be good enough to make a difference in the final outcome, otherwise who needs it? Any ideas on how you would specify such an indicator?

By the way, those who are pretty good with Excel can build a complete portfolio optimizer in GeneHunter. It comes with one example, and any standard portfolio optimization techniques found in the literature surely can be done with GeneHunter. Some time ago I posted another idea on this forum, but it might be easier to find it on the GeneHunter forum.

### **Re: S&P 500 Prediction**

Date :5/24/2002 1:26:17 PM Poster : Maciej

JK, Not being a Tradestation user, can you tell me what Inputs: RL(7),BZ(3),SZ(1); does as I'd like to code it into NST. Thanks in advance

On 5/21/2002 10:28:25 AM jk wrote: Bob-Check out [www.oddballsystems.com](http://www.oddballsystems.com). That is great place to start-Mark Brown is a friend of mine so maybe I am biased. It is an hourly trading system that uses advancers /market breadth (data set 2) to get long/short the market. The system is very simple less than 10 lines in TS. I coded it in NST in 2 minutes. To convert it into a daily system is simple. However, the results after studying the SPX on a daily chart may lead you to conclude that it is not a good end of day tradeable. That knowledge in itself is VERY useful. You can stop looking for oil in a dead well. Moving on seems as important as digging in. Too Cliche' ? Sorry :-) Also, I found it very interesting that a SIMPLE system like that is useful to many people who trade that thing. With so many options and so many optimizations etc etc etc. one can easily feel over whelmed. Folks on this board have suggested "concepts" to start creating useful systems. Concepts are great at the beginning and at the expert level. In the middle is REALITY. Getting an actual system that makes money NOW. While the account is going up- write more code and do more testing create more "concepts". At that point you feel like your getting paid to write code-kinda nice huh ?? Thereafter you can explore fractals/chaos theory .....and sound like a rocket scientist, while a 5 line systems pays the bills. I hope you find the code useful.

P.S. After reading this -I do not know why my comments are so long rather than edit this one, I will try to shorten them in the future. JK

### **Re: S&P 500 Prediction**

Date :5/24/2002 7:51:56 PM Poster : jk

I pasted the ROC indicator help from TS. It describes the generic usage of ROC so do not be confused by the text. The RL(7), BZ(3), SZ(1) are just variables. See below for detail. Hope this helps. JK

Function

RateOfChange(PRICE,LENGTH)

Parameters

PRICE specifies which price of the asset of interest is to be used LENGTH specifies the number of trailing bars to consider Returns

A numeric value containing ROC for the current bar.

Usage

Analysis should not be limited to oscillators based on one time span but should include other periods in order to obtain a more complete picture of what is happening. For example, a trader may be using a 5 day ROC which moves easily between overbought and oversold extremes. However, as this 5 day span indicates an oversold region the other short term time spans does not confirm. This is why it is often a good idea to monitor several different ROC indicators simultaneously.

A word of caution, the rate of change must be judged as too erratic relative to some other indicators, such as moving averages. The reason for this seems to be because

the equation for ROC has an over dependence on the oldest data. The ROC indicator can be calculated in one of two ways: the subtraction method or the division method. The Omega ROC function uses the division method. The equivalent of the subtraction method is found in the Momentum function.  $ROC = ((Price/Pricep) - 1) * 100$

...where Price = Current value (i.e., Close, High, Low, etc.) Pricep= Previous value (determined by the value returned for the input LENGTH) This formula is somewhat different from what you may see in some publications that do not subtract one. From an interpretive point of view it is immaterial which method of scaling is used because the general movements are identical. Omega Research prefers to use positive and negative numbers rather than strictly positive percentages, since this gives a better sense of bullish and bearish tendencies.

The parameter PRICE, is usually hard coded with some bar attribute such as Close, Open, High, Low, and Volume or is replaced with a numeric series type input. However, it can be replaced with a valid EasyLanguage expression. For example, Close + Open, or Average(RSI(Close,14),14). The parameter LENGTH, just like the parameter PRICE, can be hard coded or can be replaced with an numeric simple type input. The value hard coded or entered as a default value for the input is usually number such as 5, 10, 14, etc. Once again, you may choose to replace LENGTH with a valid numeric expression. If you do decide to make it a numeric expression there is one thing to keep in mind. The value returned for the parameter LENGTH should be a whole number cannot change on a bar-to-bar basis.

Reference

P.J. Kaufman, The New Commodity Trading Systems & Methods.

{\*\* © 1987, 1999 Omega Research, Inc. \*\*}

**Re: S&P 500 Prediction**

Date :5/28/2002 4:44:16 PM Poster : Maciej

Thanks for your help JK.

**Indicator Study: Adaptive Net Indicators -Classify**

Date :5/22/2002 5:45:24 PM Poster : Steve Kratochvil

Indicator Study: Adaptive Net Indicators - Classify

Required: Adaptive Net Indicators (Add-On) AdaptiveNetClassify.zip (See download file. This is a generic collection of example material that shows you how I use a Classify and LagClassify Nets. I built the charts so that you would not need any other add-ons.)

The Classify Adaptive Net Indicator. Here is what I have done with these. 2 through 6 are the same only allowing more inputs. I first give the Classify Net a Boolean Actual target that I am trying to hit. Anything that has a bounded 1 to -1 result will make a nice actual. Then I place the indicators that support the actual target as the inputs. The input indicators need to be bounded or normalized so that when the Classifier runs it can make choices between equal weights. Boolean inputs seem to be best for a Classify Net but it can take others. Now that I have highly qualified indicators going in as inputs, I look at it to see if it is any good at a glance. This is where I look to see if it signaling at all the right times for excellent trades. I know that the help file said the Classify Net indicator gives a range of signal from 1 to -1 but I use it differently. I use one Classify Net to bring all the other indicators together that signal a buy and then I use another Classify Net to bring all the sell indicators together and signal that. I showed this in the examples. The Classify Net seems to do very well when given one mission so I usually set a penetration line for the positive side. I like adaptive penetration lines but the example has a static line. When I have decided how I am going to read the indicator I set up to optimize ONLY the Net parameters and of these I hid the Look forward parameter. Then once I have the optimizations values I print them out and so that I can put them in under the no optimization settings. In the examples that I sent up you can see that the same settings for 1min are almost translatable to 30 min and farther to Daily, but in the end my example will not transcend markets and without other expert indicators used as inputs this example will not even survive its own market. Move the 1 min chart around on the dates a bit and you will see what I mean. It just shows you that you need good inputs and that bad inputs can be over fit to work for a little while.

I really like this net and usually add this net only to try and bring out the best in a generally successful system. It can be very useful at making best of breed choices, if it is given expert inputs.

Steve

**Re: Indicator Study: Adaptive Net Indicators -Classify**

Date :7/22/2002 8:57:15 PM Poster : Jacobs

Steve, have you ended your indicator study? I read it with great interest.

/Jacobs

**Re: Indicator Study: Adaptive Net Indicators -Classify**

Date :7/23/2002 10:05:50 AM Poster : Steve Kratochvil

No, actually I was talking with a friend about the next item on the outline. I am actually looking at getting into the next indicator. I put it off because of the lack of feed back from the forum concerning the whole idea.

Thanks,

Steve

**FILE: Re: Indicator Study: Adaptive Net Indicators -Classify**

Date :5/23/2002 2:34:49 PM Poster : Ward Net Webmaster

The file referenced in this post can be downloaded using the following link:

[AdaptiveNetClassify.zip](#)

On 5/22/2002 5:45:24 PM Steve Kratochvil wrote: Indicator Study: Adaptive Net Indicators - Classify

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I really like this net and usually add this net only to try and bring out the best in a generally successful system. It can be very useful at making best of breed choices, if it is given expert inputs.

Steve

### **Volatility DLL**

Date :6/7/2002 1:01:51 PM Poster : Mark Simpson I have a bunch of Volatility calculations I've coded that I can put in a DLL if there's enough interest. They take prices and calculate the historical volatility for the last N days. Useful for options and stocks.

If this is of use to you (2 replying to this message will be enough, please don't flood the forum), just reply, and I'll get it posted in the next few days.

Mark Simpson (zawie)

### **Re: Volatility DLL**

Date :6/8/2002 12:03:23 PM Poster : Steve Kratochvil Sounds very interesting. I would love to see it.

Steve

### **Re: Volatility DLL**

Date :6/11/2002 3:34:17 AM Poster : Richard Nowak Second Rich On 6/8/2002 12:03:23 PM Steve Kratochvil wrote: Sounds very interesting. I would love to see it. Steve On 6/7/2002 1:01:51 PM Mark Simpson wrote: I have a bunch of Volatility calculations I've coded that I can put in a DLL if there's enough interest. They take prices and calculate the historical volatility for the last N days. Useful for options and stocks. If this is of use to you (2 replying to this message will be enough, please don't flood the forum), just reply, and I'll get it posted in the next few days. Mark Simpson (zawie)

### **A Little Plus Sign**

Date :6/7/2002 4:16:18 PM Poster : Steve Kratochvil

A little plus sign. I have almost never been happier than this moment. I have come up with many different ways to control how the optimizer can or cannot change a value. I have explored countless settings and produced many profitable indicators but I did not know about the little plus sign. I was having trouble with getting a setting set for optimizing a net in a trading strategy. Steve Ward pointed out that I simply click on the plus sign after the indicator was in the window and set the limits of the values. I was thrilled. I had no idea that this was where the functionality was. In a way this helps me fill in many issues that other indicators were built to accommodate, control or never could touch. This gets back to the help files. In light of the fact that this is the second time that Steve Ward has helped me out with something that I should have gotten from the help files, I will begin to read each help file in detail. It is sometimes the basics that can be the most important thing you ever learn.

Steve

### **Re: A Little Plus Sign**

Date :6/8/2002 11:47:38 PM Poster : fhealy

There is an article under the Tips and Techniques section of this website that discusses locking indicator parameters where the little plus sign method is mentioned. In trying to duplicate that method I searched for several days trying to find out how to access the area opened up by the little plus sign, until I finally emailed NST to ask how it was done. Their email back to me explained the little plus sign's function. So, what the little plus sign did wasn't obvious to me and I was reading the tip that showed its use! I have probably looked at that little plus sign many times without realizing that it actually did something.

### **Re: A Little Plus Sign**

Date :6/10/2002 8:57:47 AM Poster : webmaster@ward.net

Let us take this opportunity to recommend that everyone re-view the training videos that come with NeuroShell, maybe a couple of months after you first receive the product. Things like the plus sign may not sink in the first time you see the videos, because you are trying to learn so much. It's like seeing a complicated movie the second time -you begin to "see" and "hear" details that didn't make an impression on the first viewing. We've put most of the important concepts in the videos. If you've had the product a while and didn't know about the plus sign, then please take time now and go through the videos again!

### **Re: A Little Plus Sign**

Date :6/10/2002 9:52:01 PM Poster : Matt R

I certainly am not complaining, as I have been using the "little plus sign" for quite a while, but I recall it not being an obvious option/feature (and I am a former engineering propeller-head). In fact, I remember insulting you in privacy about you not allowing for any sort of constrained optimization. I suggest you make it more obvious in your help files.

Regards Matt





### **What is success**

Date :6/8/2002 3:45:42 PM Poster : Bill Carlson When testing different systems, what is considered a success when analyzing a system? What figures are considered, Return on Trades, Return on Acct, % Profitable Trades, All of those mentioned can all have positive numbers and yet the Current Network can display negative figures. What ever is used, what number or target figure is acceptable? Thanks

### **Re: What is success**

Date :6/18/2002 4:52:51 PM Poster : Maciej Couldn't agree with you more its not particularly easy. You'll have to isolate the factors that are paramount to you and work from there. I like net profit to start with, I don't like Annual Return on Account as that skews my expectations, I like a highish % profitable trades as I haven't got the nerves to sit through too many losers, particularly consecutive ones. I'd also watch out for a high deviation in results typically \$ 1 all the time with the infrequent \$10000 result - to my way of working thats bad.

### **Re: What is success**

Date :6/18/2002 6:31:39 PM Poster : Steve Kratochvil Success is defined: 100% Percent Profitable Trades and Maximum Open Trade Drawdown is less than or equal to 10% of Net Profit. Steve

### **Re: What is success**

Date :6/19/2002 2:34:13 PM Poster : CBOTDOC  
FOR A SYSTEM WITH AT LEAST 60-70 TRADES OVER A PERIOD WHERE VOLATILITY HAS NOT CHANGED DRAMATICALLY, HAVING A PROFIT FACTOR OF 5- OR 6 TO ONE AND A STANDARD DEVIATION OF AN AVERAGE LOSING TRADE LESS THAN 2 TIMES AN AVE WINNING TRADE IS A STABLE METHODOLOGY. PLOTTING MAXIMUM ADVERSE EXCURSION AS A FUNCTION OF AVERAGE WIN (OR EVENTUAL AMOUNT OF CLOSED TRADE EQUITY FOR THAT TRADE) ALSO IS VERY VALID. CLASSIFYING ALL TRADES (FOR SPECIFICITY AND PROJECTED PROFITABILITY) AND PROSPECTIVELY ADJUSTING STOP AMOUNTS DRAMATICALLY RAISES THE PROFITABILITY. THIS OF COURSE DEPENDS ON A VALID PROFIT TARGET PROJECTION METHODOLOGY.

### **Re: What is success**

Date :6/19/2002 2:56:38 PM Poster : Mark Simpson(zawie) Personally I work to 200% Percent Profitable trades. A drawdown of 0%, and at least 300% return on anyone trade in 2 days. Still haven't got a model that meets that criteria yet. However, everyday I get a little closer :-)  
Mark On 6/18/2002 6:31:39 PM Steve Kratochvil wrote:Success is defined: 100% Percent Profitable Trades and Maximum Open Trade Drawdown is less than or equal to 10% of Net Profit. Steve

### **Re: What is success**

Date :6/22/2002 12:15:25 PM Poster : Steven Buss On the road to reaching the goal that Steve Kratochvil defines below, it's good to know the point at which a system's %ProfitableTrades and ProfitFactor are "high enough" to establish a

consistently smooth upwardly sloping equity curve. Seems to me that it turns out that that "high enough" equity curve is based on something less than 100% Profitable Trades.

The "Trading System Performance Viewer" Excel spreadsheet that I posted a month or two ago is a tool for figuring out where the get-the-equity-curve-smooth-and-upwardly-sloping levels are for the %ProfitableTrades and ProfitFactor trading statistics.

When you use this tool, I recommend making the inputs for these two statistics really low at first and keep pressing F9. Gradually raise them and continue to repeatedly press F9 until you get the minimum equity you're willing to trade. It's at that point that you know the MINIMUM numbers you're working to achieve.

### **Re: What is success**

Date :6/22/2002 4:43:39 PM Poster : Steven Buss I didn't phrase correctly what I intended to say in my note below. The next to last sentence in the last paragraph should read: "Gradually raise them and continue to repeatedly press F9 until you consistently get the minimum slope equity curve you're willing to trade." Instead of: "Gradually raise them and continue to repeatedly press F9 until you get the minimum equity you're willing to trade."

### **Volatility DLL - Download**

Date :6/13/2002 12:45:38 PM Poster : Mark Simpson (zawie) (Zip File - VolatilityV09a.zip sent to support@wardsystems.com for inclusion) Here's the Volatility DLL as per previous email. Installation instructions are contained in the README.txt in the zip file. The indicators also have online help and an example chart. The Volatility DLL for Neuroshell Trader contains six historical volatility calculations. All the indicators included show similar results, they just differ in their calculation and some are considered closer to the "Real Picture" than others. Historical volatility can be calculated over different time frames. E.G. You could calculate a 52-week volatility and then compare it against a 21-day volatility to see whether an equity was trading below or above it's 52-week value. For calculating a historical volatility that approximates most options volatility calculations, use the Close to Close Method and a 21-day period. The volatility indicators don't imply any direction in price but they can be used in conjunction with other indicators to help time trades. E.G. When a stock has low volatility, it can be consolidating, so it could be a good time to enter a trade. Conversely, when a stock reaches a high volatility peak, it might be a good time to exit. Adding the volatility indicators to a good working neural net will often improve results. I'm providing these indicators to foster activity on the forum. If you find these useful, please post an example chart. It takes time to prep these for public use, but I have many more indicators I've built, that I will start releasing if people are using them. Regards Mark Simpson (zawie)

### **FILE : Re: Volatility DLL - Download**

Date :6/13/2002 3:21:56 PM Poster : Ward Net Webmaster The file referenced in this post can be downloaded using the following link:

[VolatilityV09a.zip](#)

### **Hidden neurons**

Date :6/18/2002 5:27:20 PM Poster : Bill Carlson Is there any rule of thumb on how many neurons should used per issue, or parameter, or time period duration, or whatever? Or is it just trying different settings: hit or miss..

### **Re: Hidden neurons**

Date :6/18/2002 5:30:06 PM Poster : chris wong i just use atp2 plugin and then the optimizer finds the right number to use.

### **Re: Hidden neurons**

Date :6/18/2002 8:48:28 PM Poster : Steve Kratochvil 3 times the number of inputs is a good rule of thumb. Steve

### **Re: Hidden neurons**

Date :6/19/2002 2:33:49 PM Poster : Bruno As little as possible, providing you still get good performance of your neural net. TurboProp2 is quite a good neural net architecture and learning algorithm, but like most (if not all) feed-forward neural networks, if you use too many hidden neurons, your neural net may tend to memorize patterns from your training set, i.e. does not learn well the patterns 'hidden' in your data, and if you don't use enough hidden neurons, your neural net may not have the ability to learn at all the complex non linear features in your data. (by the way, you don't need hidden neurons to pick up linear features in your data) In my opinion, the only good neural net, is the 'pure' Min-Error (and its counterpart Max-Correl) neural network. The other ones are more complex, and make it more difficult to focus on the quality of your inputs and model. So, assuming you agree on this, I would use few hidden neurons and add hidden neurons until you see very little improvement in the training error. TurboProp2 already does that for you as it trains the neural network. Now, to give a more down-to-earth kind of answer: my models use max 5 to 6 entries, with max 10 to 15 hidden neurons. Again, generally smaller is better. Hope this helps  
Bruno

### **Voting System of Nets**

Date :7/12/2002 4:24:11 PM Poster : Dave Hubbard@Midwest I am wondering what anyone's opinion would be on this idea. The object of having a voting system of different nets is to get a more diverse opinion from different classes of indicators (or predictors). If a volume based net and a momentum indicator based net agree, and they are both 65 percent correct, then the results of the voting based net would hopefully be at least better than 65 percent correct since the votes are coming from 2 classes of inputs that have a low correlation to each other.

My question is what do any of you think would be the result of having a voting system of nets with the same inputs but different outputs? An example would be to use the same inputs to predict the % change in close 3, 5, 10, and 20 days out ( if they are all decent on their own or predict the %change in close over 3 days, the optimal buy, sell hold, for 3 days etc.....etc and use these nets in a voting system. Any thoughts as to whether this a good idea or foolhardy?

Dave

### **Re: Voting System of Nets**

Date :7/15/2002 10:01:05 PM Poster : Steve Kratochvil This is a great idea. Follow it further. It is very profitable. The Ward nets are extremely useful.

Steve

On 7/12/2002 4:24:11 PM Dave Hubbard@Midwest wrote: I am wondering what anyone's opinion would be on this idea. The object of having a voting system of different nets is to get a more diverse opinion from different classes of indicators (or predictors). If a volume based net and a momentum indicator based net agree, and they are both 65 percent correct, then the results of the voting based net would hopefully be at least better than 65 percent correct since the votes are coming from 2 classes of inputs that have a low correlation to each other.

My question is what do any of you think would be the result of having a voting system of nets with the same inputs but different outputs? An example would be to use the same inputs to predict the % change in close 3, 5, 10, and 20 days out ( if they are all decent on their own or predict the %change in close over 3 days, the optimal buy, sell hold, for 3 days etc.....etc and use these nets in a voting system. Any thoughts as to whether this a good idea or foolhardy?

Dave

### **Suggestions for NS Professional**

Date :7/12/2002 4:37:50 PM Poster : Dave Hubbard@Midwest I have some ideas as to possible improvements to Neuroshell Trader Professional.

1. Allow the user to map parameters across buys and sells. For example, if the user were to optimize a trading strategy using a Simple Moving Average crossover, allow the user to specify that the parameters for Simple Moving Average must be the same for both the buys and the sells instead of having the moving average values be different for longs and shorts after the optimization. This may in some instances help to prevent overfitting and allow the user to develop more robust trading strategies. The same suggestion may apply to the threshold optimization in the Prediction Wizard.
2. Allow the user to integrate multiple time frame strategies into a prediction or strategy. One example would be to allow both a weekly and daily chart into the same chart so the user could develop a voting system that takes votes from both a weekly and daily prediction. I would like to be a beta tester if you ever decide to put this into a future program! Dave

### **Re: Suggestions for NS Professional**

Date :7/15/2002 9:35:15 PM Poster : Steve Kratochvil Look at Items 1 and 21.  
Thanks, Steve

On 7/12/2002 4:37:50 PM Dave Hubbard@Midwest wrote: I have some ideas as to possible improvements to Neuroshell Trader Professional.

1. Allow the user to map parameters across buys and sells. For example, if the user were to optimize a trading strategy using a Simple Moving Average crossover, allow the user to specify that the parameters for Simple Moving Average must be the same for both the buys and the sells instead of having the moving average values be different for longs and shorts after the optimization. This may in some instances help to prevent overfitting and allow the user to develop more robust trading strategies. The same suggestion may apply to the threshold optimization in the Prediction Wizard.
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### **Indicator Study: Adaptive Net Indicators - Predict**

Date :7/24/2002 11:39:40 PM Poster : Steve Kratochvil This is the next indicator that I am going to try and expound upon. If you have any request for things you would like explored or approaches that you would like tried or time frames used in my examples. You had better get in your two cents now. Thanks, Steve

### **Re: Indicator Study: Adaptive Net Indicators - Predict**

Date :7/26/2002 8:00:03 PM Poster : Jacobs I wish I had more to request than just,

please also use EOD data and not only intraday. /Jacobs

**Re: Indicator Study: Adaptive Net Indicators - Predict**

Date :7/27/2002 11:06:47 PM Poster : Steve Cantley Timeframe: daily bars

**Re: Indicator Study: Adaptive Net Indicators - Predict**

Date :7/29/2002 3:06:07 AM Poster : Maciej Can trailing/profit target stops etc be optimised dynamically with ANI. I've had some success with signals primarily with entry ones but I cannot get much success if I insert my stops and / or profit targets into ANI. Is it realistic to expect the neural engine to optimise these sort of things? Ideally I'd use in a trading strategy only the ANI signals for entry and exit and not bother with any stops as they would be in the ANI.

**Re: Indicator Study: Adaptive Net Indicators - Predict**

Date :8/3/2002 12:09:55 PM Poster : Steve Kratochvil Which one are you using? Classify, Predict or the Lags of these? Are you trying to build a Stop and Reverse or are you going to have exits? The reason I ask is this. If your doing Stop and Reverse with either type of net then exits are built in otherwise if you are trying to introduce a type of exit that you wish the nets to determine then build a second net that does that job. Nets need to be designed for a purpose. Then indicators may reference them or use their information for things like exits if the net's job is not to signal exits. Thanks, Steve

**Re: Indicator Study: Adaptive Net Indicators -Predict**

Date :8/5/2002 1:53:24 PM Poster : Maciej

I've had better results with Lag Classify ones. I understand that the exits ie  $<0$  as opposed to  $>0$  entries can be used as exits as well as entries. I'll take up your suggestion that I use separate nets for exits. The kind of question that I'm trying to answer is of the type "is it better to exit a futures contract at end of day or should one hold the trade open through to the next session". I've been caught a number of times by overnight news that's decimated a small profit into a loss.

**Re: Indicator Study: Adaptive Net Indicators -Predict**

Date :8/5/2002 2:59:21 PM Poster : Steve Kratochvil

You can only answer that question. Here is how I see it. If your system is built to trade overnight then fix it. If your system is built to Day Trade then close all of your positions by EOD. Then in the light of the fact that you are getting killed on the over nights. Stop getting killed. You have the answer to your own questions.

I hope that helps,

Steve

**Re: Indicator Study: Adaptive Net Indicators - Predict**

Date :8/6/2002 11:09:20 AM Poster : Maciej

I only wish it were that straightforward. The issue is that sometimes its better to be in a trade overnight at other times its suicidal. To give you a recent example, my DJ system (Sep Futures) was short for most of yesterday (08/05/2002), great it

made money - my problem yesterday was at EOD would it go down early today?, Being a coward I got out, it so happens that was a correct decision if you look at the today's open. On other occasions it has been the wrong thing to do. So in an ideal world I'd like to have some sort of objective decision to be given on whether to stay in or get out. At its simplest - if more 50% overnight continuations were profitable historically I'd stay in if not then the decision would be to get out. That's kind too simple - I'd like to predict a little better.

### **defining stop losses**

Date :7/25/2002 11:06:54 AM Poster : David Onions

Hi, As a newcomer I would be grateful for some guidance. I have a net that is producing reasonable (67% successful) trades on walk forward tests using a few inputs and full optimisation (max winners versus losers) on the NT professional.

As to be expected some successful trades have an adverse period when there is a theoretical loss before closing in profit. I understand that the entry and exit signals have been optimised but can one refine the trading strategy by closing trades when the adverse position is greater than that seen with all (or a statistically defined majority) of successful trades. If so is there a way of gleaning this information from the walk forward tests? Best wishes David

### **Re: defining stop losses**

Date :7/25/2002 3:55:38 PM Poster : Maxwell Craven

You might try one of the other optimization functions that minimize drawdown. Also maybe you can think of some indicator that you can use for a price level in the trailing stops. There are some indicators in the section of indicators called trading strategy system information that will no doubt be helpful (but Ward Systems has said they are much slower to optimize).

### **Re: defining stop losses**

Date :7/26/2002 5:04:10 PM Poster : Steve in California

Getting some form of Wish List Item #13 (the old #44) in NST would help with what you're looking for.

IMO, there is no objective function that currently exists to assist with this issue of "Open Drawdown". For an objective function to be helpful, it would need to manipulate several different kinds of information (including OPEN drawdown). The current objective functions that manipulate OPEN (not CLOSED) drawdown don't manipulate other important trading strategy statistics (like Winners-Losers, etc.). In the last several days, I posted a small excel spreadsheet that showed my understanding of what information is being manipulated by current NST objective functions.

IMO, getting something about #13 would be great because it would allow you to develop your own objective functions in some way. On the other hand, IMO, it would be great too if all we got in the short term was a new objective function that combined several key trading strategy information elements. How about something like:

Maximize ( ( Winners - Losers ) \* Average ( ( Net Profit per trade / # of Bars per Trade ) / Open Drawdown per Trade ) )

See the spreadsheet I posted in the last several days to understand how this is different than objective functions that currently exist.

### **Re: defining stop losses**

Date :8/5/2002 9:18:37 AM Poster : Maxwell Craven

Further to my last post, the indicators I was thinking of are called "Position Drawdown" and "System Drawdown" and they are in the Trading Strategy System category.



## **Rules**

Date :8/5/2002 9:48:34 PM Poster : Bill Carlson

Reviewing the rules that determine the strategy of different stocks, the strategy may indicate that only one rule determines the path to trade, buy or sell.

The stocks that indicate one rule on which a decision is made provides very meager returns and sometime a loss when commissions are considered. Whereas the stocks that require three or four rules prove to be more rewarding.

Is there some way to force a requirement of more than one rule in order for it to be considered as a trade.in trading strategy.

## **Re: Rules**

Date :8/6/2002 11:20:22 AM Poster : Maciej

I use two ways of forcing the number of rules, one and probably the simplest one is on the trading strategy entry, the value by default is "all" and you can vary it from one to all. The other way which I use whenever I wish to have a finer control is simply to use the boolean such as and2 indicators to combine my rules. Further to avoid surprises in real trading I use the features available in the trading strategy wizard (its also in the predict wizard) to set up costs / slippage etc. I tend to exaggerate the slippage as that helps give me more robust strategies. If a set of rules doesn't give a reasonable result using defaults I'd be very weary of trying to optimise it, in my view its a bit like multiplying a zero by any number.

## **Re: Rules**

Date :8/6/2002 3:51:56 PM Poster : Bill Carlson

The Trading Strategy "ALL" is designated . Even so, the system chooses the rules that determine the direction of trade. Sometimes one rule, other instances four rules are applied. I do use "AND" in tying a Lag Close under Lag BB Low to Close Over BB Low. But using a Stochastic under and over a "20" or "80" to the above example seems to be cumbersome and long, But perhaps is the only way to go.

Is an "IF THEN ELSE" statement different than an "AND" statement in the final result..

Thanks

## **Re: Rules**

Date :8/7/2002 9:51:29 AM Poster : Maciej

There are a couple of "IfThen" indicators that you could use. Personally I prefer the abstraction of the "boolean" indicators of which there are more. For the "ALL" substitute a number which corresponds to the minimum number of rules that you want to trigger a signal, ie 3 will require 3 rules, and also watch the optimization if you have selected "full" or "rule" optimisation then that seems to override your "ALL" you'll need no optimization or simply "parameters" . You may find it easier to combine your several rules into one indicator then simply use the one indicator in your strategy.

### **Prediction Wizard and prediction length**

Date :9/23/2002 10:42:04 PM Poster : Gotwals

On the Prediction Wizard's first entry box the user specifies "how far into the future this indicator should be predicted:" Could someone describe the rationale for a particular entry? More specifically, I am investigating intraday trading of listed stocks by using 5-minute bars, and I would like to close out my position at the end of each day of trading.

So, I really have two questions. 1) Can intraday trading be done successfully with 5-minute bars, and 2) what would be a reasonable choice (and why) for the number of 5-min periods to predict into the future with the Change in Close indicator?

### **Re: Prediction Wizard and prediction length**

Date :9/24/2002 8:13:54 AM Poster : Maxwell Craven I usually am very successful with either 5 minute or 1 minute bars. The number to predict ahead seems to depend on how volatile the stock is and how many shares you are trading. Some futures work even better because they are more volatile. I usually do 5 to 60 minutes ahead. If you want to close out at the end of the day, you can put your prediction into a trading strategy with an time= exit rule added.

### **Multiple Time Frames**

Date :9/26/2002 2:40:14 PM Poster : Mark Simpson

Anybody out there with any pointers on Multiple Time Frames? Anyone using MTF in their systems? What methods are you using?

There seems to be a general lack of useful information on the web about it with regards to Neural Nets.

I've had reasonable success by simulating 2-3 MTF's and Time Delay Neural Networks (TDNN) using prediction wizard. Is anybody using a different or better method?

Mark Simpson zawie

### **Re: Multiple Time Frames, lags of nn output.**

Date :12/22/2002 2:15:39 PM Poster : j ferguson Mark,

I'm attempting to do the same thing (using datax) but it's slow going (I'm still building my debug toolset, etc, and learning c# at the same time..)

Basic strategy: I have a couple of nets that work pretty well through different intraday time frames (usually 1h-30min-15min, or 10m-5m-1m, around 60% correct-- tradeable but horrible commissions cost). The idea is to use the one timeframe's nets (or indicators, like  $\text{tema9} > \text{ma}(13)$ ) as a filter on shorter-timeframe trades.

Another thing I'm playing with: asymmetrical lagging of nn signals. I only have enough sample trades to be on the bare edge of statistical validity (30ish), but nearest neighbors are ok, and average return for the basket of equities nearly doubles.. I've also brought the out-of-sample data in-sample, but in the smallest way possible.. I'll let it walk forward for another 30-50 trades and let the forum know how it turns out.

Almost any net I build is 'early' on it's signals, and flip-flops. asymmetrical lags of the signal seem to limit this behavior . I'm manually searching through a small space (1-5, and 1-3 seems to be the reliable range for robust results).

### **Re: Multiple Time Frames, lags of nn output.**

Date :1/12/2003 1:35:19 AM Poster : j ferguson Lagging the NN signals didn't walk forward very well, but the NN itself proved to be more robust than I thought. Simple stuff-- 4 lags of  $\text{tema9}(\text{close}, \text{close}, \text{close})$ , but it seems to work (70% hit rate, 100% annualized, etc) regards

### **Re: Multiple Time Frames, lags of nn output.**

Date :1/12/2003 8:14:40 PM Poster : zawie

Definitely along the right tracks, but I recommend try it with at least 2 maybe 3 indicators. What I've found is that with the normal Neural Network, if you give it one input, all it can learn is the relationship between the current value and the output. If I gave you a chart, and said to you, the Moving Average is "93.8", where is the price going next. You would say to me: "What are the values before, so I can at least see if it's going up/down etc.". In my research I've found that Neural Nets aren't too different. I.E. To have a chance of learning a pattern, they must be

presented with the pattern. One way to do this is TDNN (multiple lags of the same input). I.E. Typically I lag by 0,1,2,3,4 periods (but you can also play around with the amount you lag by).

Another way, is to preprocess your data in such a fashion that you're detecting the patterns for the net first. For instance, using some of the candle pattern selections from Neuroshell is one way of preprocessing the data going into the net. A TDNN of an indicator like this wouldn't provide much benefit (unless looking for a consecutive number of pattern matches). I've found in my research, that if you take a good indicator, and then TDNN it, then combine it with another 1 or 2 good indicators (TDNN'd again). You'll find the results considerably better than without. When you TDNN the first indicator, it's as if the net locks down and become more stable and consistent in results. NN's are only miracle workers when the relationship between inputs and output are well defined, with stock data this isn't often the case. However by preprocessing you data to highlight the features you're looking for, and then designing a net to detect these, the model will generally function better. You can implement TDNN by lagging inputs in prediction wizard, however, Adaptive Net Indicators add-on also does this more seamlessly with it's LagPredict and other indicators.

Also, bear in mind when you TDNN nets, you're also adding more Degrees of freedom (DOF) to the model, which is a bad thing. So you may want to look at reducing DOF by using DDR from Jurik Research (there's a ZJurik add-on on this forum that will allow you to use DDR with Neuroshell Trader).

Regards Mark Simpson

**Re: Multiple Time Frames, lags of nn output.**

Date :1/13/2003 9:41:37 AM Poster : Steve in California Another approach to setting the \*context\* of an indicator value is to provide the slope of the line formed by indicator values, (i.e., use the "Linear Time Regression: Coefficient of Regression (Slope)" indicator).

I have not done rigorous testing of these two approaches to setting the \*context\* of an indicator value (i.e., the \*slope\* approach noted above and the lagged value approach described below) to determine if one is better than the other or perhaps better in some contexts. It would be a good thing to know which worked better. Anyone done rigorous testing of this willing to share?

**Re: Multiple Time Frames, lags of nn output.**

Date :1/13/2003 12:41:09 PM Poster : J Ferguson Thanks for your comments.. I don't think I was necessarily clear enough (still getting the hang of the jargon).. What's working for me right now is a TDNN of Steve K's tema9. TDNN's built with close work too, but not nearly as well, (and I'm pondering the purchase of the jurik indicators to get even smoother inputs). I'm using this on hourly bars, and the results have been suprising (without any optimization). The idea of building a 'panel of expert TDNN's ' hadn't occured to me yet-- that's a great idea. I don't understand your degrees of freedom comment, though. In the case of my simplest model, I'm only removing (max) fifteen degrees of freedom (current input and four lags thereof) out of a training set of >1000 bars. To me (even with 3 separate tdnn's) it seems like that is fewer degrees of

freedom lost than even the simplest of moving average systems. Right now I'm focused on building the simplest nets possible-- I was stuck in 'overfit purgatory' for way too long- starting over this way has led to considerable improvement. So now the question is, what happens when I find 5 non-correlated inputs w/ ddr, build tdnn's out of all of them, and then a master-net with each of the tdnn's as inputs? Hmmmm. Thanks for your comments! BTW, did you ever do any work on a data-X -> IB TWS interface? Regards, J Ferguson

**Re: Multiple Time Frames, lags of nn output.**

Date :1/14/2003 5:39:17 PM Poster : zawie >>;What's working for me right now is a TDNN of Steve K's tema9. TDNN's built with close work too, but not nearly as well, (and I'm pondering the purchase of the jurik indicators to get even smoother inputs). I'm using this on hourly bars, and the results have been suprising (without any optimization). I'm sold on Jurik (as you've probably gathered :-). It blows TEMA out of the water. Don't get me wrong, TEMA is good (and also Ehlers Zero-Lag (better than TEMA, not as good as Jurik)). If I was to put Jurik, Ehlers, TEMA, EMA and SMA on a scale of 1-10, I'd say: SMA=1, EMA=3, TEMA=6, Ehlers=8, Jurik=10. However, I'd suggest trying at least 2 different lengths of whatever moving average you decide to use. Also, try some other indicators too, i.e. not just moving average type indicators. >I don't understand your degrees of freedom comment, though. In the case of my simplest model, I'm only removing (max) fifteen degrees of freedom (current input and four lags thereof) out of a training set of 1000 bars. To me (even with 3 separate tdnn's) it seems like that is fewer degrees of freedom lost than even the simplest of moving average systems. The problem is, that the more inputs you have to your model, the higher DOF, hence the less faith you should have in the model. I.E. If you have 2 models, backtesting is the same, but one has 15 inputs and one has 5. You'd pick the one with 5, because the inputs are more accurately specified and define the output better. The problem with TDNN is that you're multiplying your number of indicators by the number of lags, hence you're using considerably more inputs to the net. The solutions is a) Ignore it or b) Try to remove highly correlated data within the inputs. I.E. You take 15 inputs, feed it to a decorrelator, and out pops 3 signficiant inputs. You feed those to the net. >So now the question is, what happens when I find 5 non-correlated inputs w/ ddr, build tdnn's out of all of them, and then a master-net with each of the tdnn's as inputs? Hmmmm. I'll slip another thing into the equation, use 2 more timeframes too. :-) >Thanks for your comments! BTW, did you ever do any work on a data->X IB TWS interface? I have it on the list of things to do. I've been waiting for NST 4.0 alpha to evaluate the new data pump to see if it would work for this. The alpha has recently been distributed, so I'll let you know soon. Regards Mark Simpson

**Re: Multiple Time Frames, lags of nn output.**

Date :1/15/2003 9:41:47 AM Poster : Steve in California One of the reasons I've been using Linear Regression Slope as a means of providing the \*context\* of an indicator value to the nn rather than multiple lags has to do with precisely this issue of keeping the degress of freedom down. As I said before, however, I haven't done rigorous testing to determine the value of the two approaches.

**Re: Multiple Time Frames, lags of nn output.**

Date :1/15/2003 3:44:00 PM Poster : J Ferguson Thanks for everyone's comments.. Now I've got a lot of different directions to explore.. >So now the question is, what happens when I find 5 non-correlated inputs w/ ddr, build tdnn's out of all of them, and then a master-net with each of the tdnn's as inputs? Hmmmm. >I'll slip another thing into the equation, use 2 more timeframes too. :-)  
I'm still getting my c# base classes finished (finally got the datax dll working), but I should be able to play with that soon. Questions: when using MTF, aren't you using wayyyyy more degrees of freedom than a single-timeframe? How much do you worry about it? Have your results improved, either quantitatively or qualitatively? Regards, J Ferguson

>Thanks for your comments! BTW, did you ever do any work on a data->X IB TWS interface? I have it on the list of things to do. I've been waiting for NST 4.0 alpha to evaluate the new data pump to see if it would work for this. The alpha has recently been distributed, so I'll let you know soon. Regards

Mark Simpson

**Re: Multiple Time Frames, lags of nn output.**

Date :1/15/2003 3:19:31 AM Poster : Daniel P Lyons

A degree of freedom is frequently associated with each free parameter in a simulated trade history. The central limit theorem requires you to have sufficient data to validate your system. Most statisticians would demand 30 decisions for each degree of freedom (DOF) in your solution. Therefore, you must not only take into account the DOF associated with each indicator you may be using, but you also need to account for each rule in your strategy. I think you may be surprised as to how many DOF even simple systems have. In this regard, it is most important that you have a sufficient number of buy/sell trading decisions for the dataset you are validating your solution with. Since there cannot be an exact solution to your problem, you can only emulate a solution while keeping DOF, total trades and trade frequency under control.

Daniel

### **Redundant Haar**

Date :10/7/2002 3:49:19 PM Poster : zawie I've been researching into Redundant Haar Wavelets (they don't suffer from End Point Distortion). Looking at the thread back in 2000 where some examples were given, and a message by Steve Ward saying that he's seen some good nets with RedHaar I came to the conclusion they would produce something useful. But currently I've had no real results with them. I tried Victor's recommendation of feeding scales 1-6 into a net and trying to predict scale 3. Sure enough I got superb correlation (0.91) and an MSE of 0.050 and a lookahead of 5 bars on pretty much any stock/index. This made me suspicious. When I investigated further, it turned out that the scale 3 was lagging by 5 bars anyhow, so though it was a good predictor of scale 3, it didn't seem much use because it wasn't predicting ahead. Can anybody shed any light on the best way to use these indicators? Regards Mark Simpson

### **curve fitting**

Date :10/12/2002 9:31:21 PM Poster : jk

It has been detailed in various ways that curve fitting solutions/systems are to be avoided ( the system will not work on out of sample data). Much effort is spent on avoiding curve fitting (walk forward etc etc) which I will assume is obvious to this board and will not reiterate . However, aren't we really being led down the same path with an iterated "out of sample" data series that is positive? By iterated I simply mean one simply just plugs and chugs until the "out of sample" looks nice with minimal draw down etc etc and that is a "workable" system. We are just curve fitting on different data. I have seen this question posed in various places however, I have never really seen anyone who utilizes these techniques answer them directly. Saying that they "work" and that is good enough is not really what I am looking for (if that is your thought -read "FOOLED BY RANDOMNESS"....amazon.com <\$20). Or if you read the book any thoughts on the book in the context of curve fitting would be very useful seeming to all who subscribe. Any thoughts on this issue would be most welcome. Thanks in advancejk

### **Re: curve fitting**

Date :10/13/2002 8:43:21 AM Poster : Steve Ward

For my thoughts on this read the tip on this site called Major Modeling Caution.

### **Re: curve fitting**

Date :10/13/2002 2:00:06 PM Poster : jk

Yep, I believe your thoughts are valid and well said. I was wondering if others on this board had any other ideas on the topic.

Secondly, there are other statistical methods to determine if an issue is "tradeable". An example would be "continuity" . Continuity being defined by quantifying (chi-squre) the price movements to see if they repeat. If they repeat to a chi square of X ....this would lead to a candidate for prediction. This provides me a black and white answer ...kinda nice in this fuzzy world. The problem of finding a tradable issue has come up several times with various answers and varying degrees of robustness. These techniques do not fit within the trader context as they take a different mental path toward features/upgrades (current mind set seems to be to add more depth to the current capability). I wonder if some in the NS user community would like to see features that are more fundamental to "trading" than adding "nicities" ?

As Ward products have been (in my opinion) far more forward thinking (the problem of out of sample testing is taken head on-problems and all) than other products; I wonder if other users have similiar thoughts at looking at the problem from various perspectives as well. I wonder too if those ideas might be of better use of a programmers time than adding "nicities".

### **Re: curve fitting**

Date :10/14/2002 12:10:10 PM Poster : zawie



Yep, bear in mind Steve Wards comments on that one :-). I always keep either an out-of-sample, out-of-sample, or I'll reset the model to start from an earlier date and see if I still get good results. (so all my training sets, change). Then I'll check it on additional stocks. No hard and fast rules on it, I eye-ball it. But be careful not to end up doing the same thing all again. Theoretically you could go to infinity. It's a major modelling concern, and you can never be too careful of this problem. I've seen a few people with models that they think work well, but when you investigate you find that the out-of-sample has been rendered in-sample. Another common problem is feeding data that the net already knows about into the net such that the net is no longer predicting the future, as it already knows about it. The net has brilliant MSE and correlation values, and you make tons of money on paper. Those are the warning signs, and also you tend to get a glitch

(sharp jump) where the Actual Signal on the net ends. An example of this would be, trying to predict MACD 2 periods in advance. With open/high/low/close (or some function of) as inputs. This net would produce superb results. BUT. Macd is a lagging combination of a function on high/open/low/close. So the net learns to immitate the formula for MACD, pretty well and you get superb results. To be useful, you'd want to say predict it 10 periods in advance. But if you do this, you'll find those unbelievable results have disappeared.

What you're predicting is important. Percent change in open is safe, but anything else can be dangerous. To check, pull up the indicator you're predicting against the chart and see how much lag you have. You then want to predict ahead more periods than there are lag (to be totally safe, there are exceptions) to make sure you're getting a real solution. Mark Simpson

### **Curve Fitting, Out-of-Sample Testing, and Multiple Timeframes**

Date :10/16/2002 11:38:09 AM Poster : Steve in California

JK's note asking about other thoughts prompted this note.

It seems to me that questions centering around curve fitting, out-of-sample testing, and multiple timeframes are related in the following way. (I should state at the outset that the ideas I sketch below are based on a lot of multiple timeframe bar observation but NOT on a significant amount of testing of results acquired through work with NSDT.)

I believe that out of sample testing results are often different than in sample results for a single simple reason. The reason is that larger timeframe market contexts are ignored.

My hypothesis is that a momentum indicator signal sometimes succeeds and sometimes fails such that it is unreliable per se, because the state of the trends in multiple larger timeframes are different. The weight that one should assign to a momentum indicator buy signal needs to be different when multiple larger timeframe trends have just begun to turn up than when larger timeframe trends have just begun to turn down.

I believe that out of sample testing results are often different than in sample because the state of larger timeframe trends is different in sample and out of sample. A net that is in sample "curve fit" to trade well in a larger timeframe uptrend is much more likely to trade well in an out of sample period in which the larger timeframe trends are also up than when the larger timeframe trends are down.

My hypothesis is that "curve fitting" in itself is not necessarily a negative thing per se. It's

a huge problem though if one ignores the larger timeframe market contexts for which a net has been trained. In this case, the out of sample results will be disasterous.

So, the practical question is how one might do filtering of signals generated from a single timeframe in NSDT based on the trend in multiple larger timeframes. (IMHO, one larger timeframe is not enough.)

An approach I've begun to experiment with is to use the NSDT Rule Indicator "If CONDITION #1 then =X elseif CONDITION #2 then =Y else =Z". The idea is to establish tradeable larger timeframe trend states in condition #1 and condition #2 such that X and Y can be used to establish solid in and out of sample single timeframe signals. Z, I'm thinking, is the default "no trade" state.

To tie this thought back to the note subject line: the idea here is to reduce the degree to which curve fitting is a problem (hence, out of sample results aren't good) by establishing solid market contexts in which signals may be trusted in conditions 1 and 2.

Any thoughts on this approach or an alternative are much appreciated.

### **Re: Curve Fitting, Out-of-Sample Testing, and Multiple Timeframes**

Date :10/20/2002 7:21:40 AM Poster : Chris Alford

Steve,

If I understand your proposal there are two concerns:

- (1) insufficient data is included in sample to adequately predict the current market state because of a lack of data for the higher timeframe, or
- (2) the signals are possibly only accurate for some of the higher timeframes.

To deal with (1) you only take signals for higher timeframes that are well represented in the in-sample data set.

The simple solution would be to have sufficient data so that all higher timeframe market states are adequately represented. In this case higher timeframe values can be inputs to the model, and better if the inputs are continuous variables than discrete.

I had been thinking of a related problem recently.

I do forecasts for the next trading day. I classify the type of day (eg up, down etc) in my history data, and do a forecast for the next day of the probability of each type of day occurring. I also forecast trading ranges for the next day, and I was wanting to experiment and see if I could do meaningful intervals about these ranges depending on the type of day forecast to capture extreme days. The trading ranges have to be somewhat smoothed by the regression, and I don't get a feel for the range of the high or low forecast. For example if the open turns out to be the low for the day, then I want to know the likely high for an UP day. It would be rare for the forecast low to be at the open value.

I don't have the day type in the inputs, partly because it is a discrete variable, but also because it is implicit in some of the OHLC inputs I have. As an experiment, what I would like to do is have a filter so that only records for days that match the previous day type as used as input to the prediction. As a secondary filter I could only use those days that were up days for example in the insample.

In econometrics there are some ways of determining the forecast interval, a range for

the point estimate, at some level of error. What I am trying to do here is put an interval around the trading range for the NST forecast. I'm not sure what the best approach might be, or even if any statistically meaningful result can be generated.

The problem I see with the Rule Indicator approach is that you do not automatically know whether you have any or enough data in the in sample data of the market state reflected in the out of sample data. If you knew beforehand that all the insample was from a larger timeframe uptrend, then predicting out of sample downtrend would be dubious.

In your case the larger timeframe might be the filter. I think I am asking for something different to your condition approach with the filter. Would be interested in your comments on my idea.

As an aside I would expect you would get a different buy signal for each of the higher time frames compared to that of the lowest. You could take the lowest timeframe buy after the buy in the highest timeframe is signalled, but by then half of the profit in the trend will have evaporated. Its like buying a dip in an established uptrend. Many of the buy signals in the lowest timeframe will be wrong, but if you get confirmation in the higher timeframe you stay with it and widen the stop from that of the lowest timeframe.

#### **Re: Curve Fitting, Out-of-Sample Testing, and Multiple Timeframes**

Date :10/22/2002 9:25:00 AM Poster : Steve in California

Thanks Chris for the feedback. You've raised many interesting points and questions so I thought I'd reply with comments within your note prefixed by '\*\*\*\*'.

#### **Re: Curve Fitting, Out-of-Sample Testing, and Multiple Timeframes**

Date :11/4/2002 7:43:31 PM Poster : zawie

>I don't have the day type in the inputs, partly because it is a discrete variable, but  
>also because it is implicit in some of the OHLC inputs I have. As an experiment,  
>what I would like to do is have a filter so that only records for days that match the  
> >previous day type as used as input to the prediction. As a secondary filter I  
could >only use those days that were up days for example in the insample. >  
>\*\*\*\* It's not clear to me how one would create a "filter so that only records for  
days >that match the previous day type" would be used.

There is another way you can do this. There's a special value called \* or 3.4E38 which you can enter into any neuroshell numeric field. This will set that particular bar to nothing, nada, zip. By my understanding, if the neural net doesn't have any data it can't calculate the value, so it doesn't train on it, and doesn't make a prediction. You will see a gap in your data everytime you use this value. So just train it on a "Rule" based prediction, which sets "\*" for the value where you don't want any prediction. Also, on a side note, as you now have less data, you'll might have less than the minimum required for your training sets etc, so increase the size if necessary. (You'll spot it easy enough in the prediction output).

Regarding Multiple Time Frames, I've been doing quite a bit of research on the area. Neuroshell doesn't currently support multiple timeframes (though I think it's in the works at some point), so currently you have to be a little creative to use multiple timeframes with NST, and it's also beneficial if you can write you're own

DLL's.

Here are some of the ways I've either implemented, or could be used to implement Multiple Timeframes in NST:

1. Simple MTF's (not true), but adequate for most purposes, is to say pick a 20,80,3200 day moving average. It really depends on the indicator whether you can get away with this or not. An indicator that takes any other time series except the close, i.e. say something that used the high and low of a bar, probably not.
2. Bring up 3 charts at different timeframes, and use DataX Api (from Ward) and a custom app. Very clean on the chart/indicator end, but not too elegant on the custom app end. It really depends on how many timeframes you're doing.
3. Program yourself an indicator, which divides down the timeframe. But, if you want to use any other indicators, you'll probably end up coding them to take the new timeframes, because the NST indicators will be expecting data in the base timeframe format.
4. Program yourself an indicator, which deletes bars from the data, and drops data out of the time series (using the 3.4E38 as above). Then realign the data to the end of each time interval. This works well, and doesn't upset the NST indicators. I use this method to do most of my MTF work. At some point in the future, I'll release the indicator I've created to do this

None of these methods are ideal, they're just a fudge to get MTF's into Neuroshell, until it's a feature. What makes NST such a good product is the fact that you can interface to it, and do these weird and wacky things :-)

Other issues that need to be considered when producing MTF's are the following:

1. Scale. Conventional thinking is each timeframe being 4-6X the lower timeframe in length. I've also found that multiple mini timeframes, each one slightly longer than the first, when combined can be powerful. For instance, you might decide to combine 200 timeframes, each one only slightly bigger than the previous. (You'll need to custom program for that).
2. Quantity. Again conventional thinking suggests 3 timeframes, small, medium and large. You trade in the medium, look to the large for confirmation of the overall direction, and execute the trade entry in the small timeframe.
3. EPD (End Point Distortion). The problem with MTF's is that the bar at the higher timeframe, may not be complete at a particular point in time. I.E. Say you were trading intraday bars, and using a daily MTF. The daily MTF wouldn't be complete till the end of the day, so if you were trading intraday, you'd be using yesterdays bar for the daily and not today's. The further you are away from this point, the more EPD you suffer. The method, I've investigated is picking a "day window" and rolling it forward at each intraday bar. Therefore at any point in time, you no longer have the EPD resulting from using a higher timeframe. (though obviously the data at that timeframe changes quicker now). The "daily" example here, is a bit of a bad example (as I can think of reasons why you would want to keep a day timeframe in it's correct timeslot), but it's a bit clearer to understand as an example.
4. Daily timeframe is special. Whilst we're on the day subject, the daily timeframe is a little bit special in terms of how it's traded. For instance timeframes which cross the day boundary (i.e. say you have 1hr, daily, weekly timeframes) are

crossing the boundary between intraday trading and longer term trading. Just be aware that the "Day" has some special properties as a timeframe due to this. E.G.. Daily high/lows often serve as support/resistance, etc.

Mark Simpson zawie

**There's got to be an easier way.....**

Date :12/3/2002 2:25:55 AM Poster : gretsch

I have just started using Neuroshell and hope my post is not too naive. Steve Ward says Neuroshell has no scan & filter feature akin to MetasStock's Explorer, because " We screen, but instead of screening for stocks that match a particular pattern, we screen for patterns that work best with your stock"

But if we have no pet stocks and just like to trawl from a whole Exchange, it would help if Neuroshell could narrow down the choice from hundreds to tens before we do individual predictions.

My question is: Can the fuzzy indicators be used to describe a pattern that is good for prediction (e.g. regular cycles, sufficient liquidity, reasonable volatility), and then we make a chart of several hundred charts to score and rank the output to see how close they are to this fuzzy pattern description?

**Re: There's got to be an easier way.....**

Date :12/3/2002 5:25:00 PM Poster : Maciej

Hi,

My solution is to use other software to do the pre-scanning, ie find those regular symbols(I work with futures) that seem to work best and then to use NSDT for it's neural engine as much as its set of indicators. To do it otherwise with NSDT would be a formidable task because of the varying multiplier factor for futures, ie x50 for grains, x 10 for cocoa etc as well as the problem of automating the changing contract months. Assuming I understand your question correctly I'd suggest that NSDT can be extremely useful when you already know where you're trying to head and wish to take advantage of the neural network capabilities.

In respect to your specific question, I'd suggest that its likely to be possible but I believe that this type of solution is not the most efficient approach to solving your problem.

Good trading!

**Re: There's got to be an easier way.....**

Date :12/4/2002 10:41:01 PM Poster : gretsch

Yes, I have begun to use other software for scanning and filtering. But the problem again is, there are no indicators that can filter for stocks with regular cyclical characteristics and/or are presently in a cyclic mode-the type of stocks on which the NSTP works best. MESA is not able to scan either. Looks like we'll just have to eyeball a list of charts, unless someone has some other bright idea? Ideas anyone?

**Re: There's got to be an easier way.....**

Date :12/11/2002 10:55:59 AM Poster : Dave Johnson

If one can limit the search to EOD data, the best scanning software that I have seen is from Quotes Plus. They provide an EOD data service, by which the entire market is downloaded to your local PC several hours after the close.

This is done via a compressed data download; the data transfer is relatively fast (I guess several hundreds of kb's), and is then followed by an "unpacking/update" function, which updates a database on the local drive.

After that point, you have the entire market stored and available locally for 5 or

10 years of data (I am not sure of the exact amount, except to say that it has never been a limiting parameter; and for futures, there is clearly a limit to the length of time).

The program also provides a function to automatically create Metastock format files from the raw local data, which are then available to all other application software, such as Neuroshell (or Metastock, etc.). The Metastock files are then automatically updated as part of the download/update process.

This data service costs something like \$25 a month (though I am not sure of the exact amount).

For scanning, the software includes a scanning functionality via a simple language. There is a large set of pre-defined scans available, either supplied with the software, or available from independent web sites. For instance, one can scan the entire stock market to look for those stocks that are within defined parameters of stochastics, daily volume, ATR, some define price range, dmi/dmi+/dmi-, etc. etc. etc. The scanning software generates a "list" (.lst file) which is a simple text file containing then stock symbols (or futures or mutual funds) and whatever other data you choose to write to that text record, as defined by the programming language. I have copied two simple scans below, which show how one can scan for changes in data, and another that shows the use of technical indicators. They also have fundamentals built in for scanning:

This one references a previously created list of stocks in the file "ptatr.lst", and then creates a new list in the file "possibbull.lst". The (0) and (-5) are time shifts of the data, with 0 being the latest, and -5 being 5 days back.

```
//input = "ptatr.lst output = "possibbull.lst"; if close(0) < close(-5) * .9 and low(0) < low(-1) and high(0) < high(-1) and close(0) >= low(0) + ( range(0) / 2) then println symbol; endif;
```

The next example is a simple indicator scan, looking for MACD crossovers, with some other filtering:

```
// MACD CROSSOVER Set MACD=12,26,9; output="macdcross.lst"; issuetype common; DaysRequired=220; DaysToLoad=500; if MACD(0)>MACDSignal(0) and MACD(-1)<MACDSignal(-1) and Close(0)>EMovAvg(0,200,cl) and Vol(0)>250000 and Close(0)>10 then println symbol , " , open(0) :8:3," , high(0) :8:3," , low(0) :8:3," , close(0) :8:3," , vol(0) :8; else if MACD(0)<MACDSignal(0) and MACD(-1)>MACDSignal(-1) and Close(0)<EMovAvg(0,50,cl) and AvgVol(0,-29)>500000 and Close(0)>10 then println symbol , " , open(0) :8:3," , high(0) :8:3," , low(0) :8:3," , close(0) :8:3," , vol(0) :8; endif; endif;
```

I don't know the details of all these scans -- just pulled them off the program archive. The web site explains more.

This scanning functionality, combined with the complete local database, allows the scanning of a large set of symbols to look for specific patterns which then may (and I say MAY here) allow the pre-determination of potentially suitable equities for further Neuroshell analysis. This is, of course, a function of your ability to determine a set of indicators for scanning that will in turn filter for the best candidates for Neuroshell. It may be possible to find fairly liquid symbols that have cyclic characteristics, for example, using some combination of

conventional indicators. Then add filtering filter for options availability, average daily volume, suitable price range, etc.

At the end, you have a list, which then must be used for creating the Neuroshell set of charts. That is a manual step, unless there is yet another clever way to automate that process....

I use Quotes Plus for data, and sometimes for scanning. I will never return to a more conventional data service for my basic daily data. Of course, for RT or intraday, one still needs qfeed or esignal or some equivalent. It is hard to imagine a similar scanning functionality for large sets of symbols for intraday data -- the problem is just too large.

Sorry about the length of this....

**Re: There's got to be an easier way.....**

Date :12/5/2002 2:34:37 PM Poster : Steve Ward Here are some that I current like to trade, and they all have single stock futures contracts too: DELL, BNY, GENZ, MMM, and SBC I actually decided upon them after I loaded all stocks with single stock futures contracts available. Then I ran a few models. These are the ones that held up, and you can see why by just looking at how the price fluctuates. I am sure there are other good stocks to examine, but right now I am concentrating on futures.

**Re: There's got to be an easier way.....**

Date :12/6/2002 4:09:15 PM Poster : Steve Ward Add KO, XOM and AMGN to the list. On 12/5/2002 2:34:37 PM Steve Ward wrote: Here are some that I current like to trade, and they all have single stock futures contracts too: DELL, BNY, GENZ, MMM, and SBC I actually decided upon them after I loaded all stocks with single stock futures contracts available. Then I ran a few models. These are the ones that held up, and you can see why by just looking at how the price fluctuates. I am sure there are other good stocks to examine, but right now I am concentrating on futures.

**Re: There's got to be an easier way.....**

Date :12/23/2002 2:35:23 AM Poster : j ferguson I've also done well modeling JPM & AIG, plus the ones steve mentioned (GENZ in particular)



### **Retraining**

Date :12/11/2002 5:22:19 AM Poster : Nalin Pasricha When one presses the 'Retrain' button in the prediction wizard one gets the following options: "Choose Yes to train only a more recent net. With this option , your current out of sample predicted values and trading points will remain unchanged. This option is recommended if you are currently trading this prediction" "Choose No to retrain/ optimize all your walkforwards and current net on the more recent data. Note that retraining with more recent data will cause the out of sample predicted values and trading points to change" I have a prediction which I have back tested using 200 walk forward tests of 1 week each - this way I have an out of sample back test of about 4 years. The prediction requires that I always have a position in the issue – either long or short. The results of this back test look quite good - so I am anxious that the training procedure I use once I start trading closely reflects the procedure used in the back test. My question is -which of the following training procedures should I use once I start trading - so that my training procedure closely reflects what NST did during the back test. Should I

1. Retrain my prediction once a week using the option "Choose Yes..", or
2. Retrain my prediction once a week using the option "Choose No..."

### **Re: Retraining**

Date :12/11/2002 1:44:53 PM Poster : Steve Ward Perhaps if I explain the history of this option, it will be easier to understand. In the beginning of NeuroShell there was no option and it only took the "no" path. Note that after the walkforward data ends, your real trading starts with new data, but the real trading picks up where the walkforward trading ended. In otherwords, if you ended walk forward data in a long, then you start in the same long in the new data. Now if you later come along and retrain with newer data, everything moves forward a little. Retraining can cause the old trades to be different, and therefore, the current trade could be different too. You could retrain and find that the new model says you should be short instead of long. That bothered people who were ACTUALLY trading the old model, because they may have been long. So we added the option to guarantee that if you were actually trading, old signals wouldn't change on you in midstream. But you aren't actually trading now. Therefore, you could use either option safely, but I'd choose "no". Either way, you are going forward with a newly trained net. But to REALLY make sure you are using the same net you saw the results from and to make sure you keep those good results you got earlier, see this tip on this site: "Going Forward On The Same Net You Evaluated".

### **Re: Retraining**

Date :12/26/2002 4:17:20 PM Poster : Peter Chen The tips article Steve referred to, "Going Forward On The Same Net You Evaluated", states "This can sometimes be advantageous if you have optimized your nets, because the optimization does not usually take place on the current net."

I am surprised to see it states that the optimization does not usually take place on the current net. I have thought the current net is always trained using the same parameters users have specified for training, including same parameter search and input selection optimizations users have asked NST to perform. Could you explain why and when the current net may not perform optimization ?

**Re: Retraining**

Date :12/26/2002 5:14:51 PM Poster : Steve Ward When you select "Optimize on training set", then optimization takes place on the oldest walk forward training set. If there are no walk forwards specified, then optimization takes place on the current net training set.

So let's say there are two walk forwards. Optimization repeatedly changes parameters in the inputs, retraining the oldest net (wf 2 net) with each change. Eventually it finds the parameters that result in the best training for WF2. Then those parameters are frozen, and they are used for training WF1 and the current net without further optimization.

### **Next day open prediction?**

Date :12/18/2002 1:34:56 AM Poster : Darek

Hi, NST has many possibilities to create solutions of different problems ect., but has anybody built trading system (or nets) to predict very well next day open(price, especially of future contracts )? Could anybody give me an answer what solutions are the best? What is a precision and errors? What kind of inputs do you use? I reach a conclusion that it's very difficult to predict accurately next day open price. I'll be grateful for your hints. Darek

### **Re: Next day open prediction?**

Date :12/20/2002 3:56:02 PM Poster : Maxwell Craven

I had a fair degree of luck predicting the next day's open for SPY last year, at least for a while. Actually I predicted whether the next day open was up or down using the adaptive indicator plugin. I don't recall now exactly what I used as inputs to the adaptive nets, but it had to do with trading in the last hour of the day using 1 or 2 minute bars. I tried 5 minute bars but didn't do as well. If I find that chart I'll tell you what I did.

### **ToSteveWard: Suggestions for using PCA, Wavelets**

Date :12/25/2002 9:50:41 PM Poster : Ng Tian Khean

Sometimes we just like to play around with NSTP and try all sorts of Indicators, prediction outputs, graphing and visualization techniques etc Steve, Principal Components Analysis and Wavelets are two of the Indicators in NSTP which look very interesting. How about you, or anybody here, posting suggestions on how we can make use of them. I have a feeling if we can calculate these and Export and plot them in e.g. Matlab, we can gain great insight from the visualization of these multi-dimensional data sets.

### **Re: ToSteveWard: Suggestions for using PCA, Wavelets**

Date :12/26/2002 5:29:30 PM Poster : Steve Ward

Well, those who don't have Matlab could also plot in Excel. I have never used any plotting other than that in NST, so by all means experiment and tell us what you find. PCA is a big subject and I might write a tip on the mathematical basis after the holidays are over. The wavelets I have had the most success with are the Redundant Haar wavelets in Advanced Indicator Set 2. The smoothed values look remarkably like Jurik adaptive moving averages (according to some of our users). But I use the Haar coefficient values in neural nets, usually neural indicators. However, my work in wavelets is limited so I'll let other users further respond. In any case, I think there is plenty of room for your research, because it is a vast field.

### **Re: ToSteveWard: Suggestions for using PCA, Wavelets**

Date :1/2/2003 8:50:24 PM Poster : Tom Gamon

I have developed some very simple models that have done very well in sample and over the last year out of sample using the redundant haar coefficient. For SLB you might want to try this.

1. Create Indicator WSG Redundant Haar Coef (Close,1)
2. Use the Neural Outputs Indicator to create an Optimal 3 day Buy/Sell/Hold using the WSG Redundant HaarCoef (Close,1) instead of the default Close. (Line 1. Above)
3. Predict Target - 4 days ahead the Optimal 3 day Buy/Sell/Hold using the WSG Redundant HaarCoef (Close,1) Line 2. Above ...However Change the objective parameter to maximize the % Wins. Usually they will be about 73% correct in sample and out of sample.

Select the Input Selection Parameter to Optimize.

Inputs: 0-5 day lags of Line 1 Indicator and Line 2 Indicator

Training set used to build prediction model: Maximum training set size = 5 Years

Minimum training set size = 3 Months

Walk-forward testing to evaluate past out of sample prediction performance: Number

of walk-forward tests = 1 walk-forward test Size of the walk-forward tests = 1 Year

Number of optimal walk-forwards = Optimize on training set

Training objective used to select optimal network structure and optimal

inputs/parameters: Objective = Maximize % Correct Sign Trading Positions = (No

Trading Positions) Training parameters Maximum number of hidden neurons during training = 10

Optimization parameters Number of hidden neurons during optimization = 10  
Maximum number of inputs = 10

Then Apply the Out of sample results to the Trading Solution Using the following rules:

Long if Out of Sample > 0, Short if Out of Sample < 0

For SLB the Out of Sample

Performance period 12/27/01 to  
1/02/02 was 80.4% 84 Trades 56

Wins 27 Losers.

It also works well on SPY Last year but only 23%, 72 Trades 45 Wins 26 Losers

**Re: ToSteveWard: Suggestions for using PCA, Wavelets**

Date :1/4/2003 10:51:19 AM Poster : Peter Chen

Thanks for the detailed description of your experience. However, there are only four trading days for your SLB out of sample performance period 12/27/01 to 1/02/02, and you had 84 trades. Did you mean 12/27/00 ?

**Re: ToSteveWard: Suggestions for using PCA, Wavelets**

Date :1/4/2003 2:12:56 PM Poster : Tom gamon

Sorry for the misprint 12/27/01 to 01/02/03.....early in the year!

### **Neural Indicators vs. Cluster Indicators**

Date :1/6/2003 11:19:58 AM Poster : John Gotwals I have had moderate success with the cluster indicators, but zero success with the neural indicators. I am using these indicators with the strategy wizard set for 5 minute bars, and am modeling NYSE stocks. I use mostly momentum related indicators as inputs to the neural and cluster indicators, and normally optimize over 3-4 weeks worth of 5 min bars.

I would greatly appreciate any comments you might have about these two sets of indicators. -- John

### **Re: Neural Indicators vs. Cluster Indicators**

Date :1/9/2003 8:49:34 AM Poster : chris wong did your ni fail to work during optimization or during backtest?

### **Re: Neural Indicators vs. Cluster Indicators**

Date :1/10/2003 1:05:29 PM Poster : John Gotwals They failed the forward tests. Right now I am getting better luck by cutting the number of inputs to two. Previously, I was using four. Maybe that was my problem?

### **Re: Neural Indicators vs. Cluster Indicators**

Date :1/10/2003 4:02:16 PM Poster : chris wong ni have a lot of free variables but i dont think 4 inputs is a problem. how much data was in the optimization and how much in the backtest?

### **Re: Neural Indicators vs. Cluster Indicators**

Date :1/11/2003 4:31:17 PM Poster : John Gotwals I am currently working with 5-min bars, and I would use about 3 weeks worth for optimizing and 1 week for the forward test. I now believe that the forward test was too long.

### **Re: Neural Indicators vs. Cluster Indicators**

Date :1/13/2003 2:00:46 PM Poster : chris wong or maybe optimization period was too short.

### **Normalizing Inputs for intermarket nets**

Date :2/25/2003 1:18:26 PM Poster : Dave Hubbard at Midwest

I have run some nets using inputs that I know have an effect on what I am trying to predict. It seems that I sometimes run into a brick wall with respect as to how I should normalize the inputs. For instance, I will try using percent change in some stocks to predict the percent change in close of another stock or index. ( This is just one example) It seems that I end up with something good only once in a while yet I know from my previous trading experience that these markets do have an effect on the market i am trying to predict. I have had similar problems with the neural indicators with respect to intermarket nets. I just wonder, might I be trying to predict the wrong output or might I need to normalize my inputs differently? Any hints or ideas would be appreciated!

### **Re: Normalizing Inputs for intermarket nets**

Date :2/25/2003 4:26:09 PM Poster : Texas Bubba

Try usin the percent spread or releative strenth between them two stocks. Then I doubt ya have to do any normalizin.

### **Re: Normalizing Inputs for intermarket nets**

Date :3/18/2003 1:57:20 PM Poster : Maciej

I too have found difficulties in normalizing data so that they give good results.

In my case I tried to make the neural network learn about and recognise two bar reversals. My idea of normalizing was to use ratios of all the rules so that for instance the rule "first bar opens near the the low" would be a ratio of open divided by the low and so on for all my other rules. The idea that I had was that the network would recognise the interesting combinations of the various ratios for each of my rules so that it could predict well and of course not be tied to one stock or in my case the Dow. This approach has been unsuccessful probably because I rendered the exercise too complex. I'm looking at clustering the ratios somehow as that may make the problem more solvable. Like you with your indicators, I know that these two bar reversals can work and when visually used these bars are useful. I seem to have read in this forum that nets are good on simple problems.

Perhaps the forum webmaster can point both of us in the right direction.

### **Re: Normalizing Inputs for intermarket nets**

Date :7/4/2003 2:01:18 AM Poster : Martey Newman Dave, It seems to me that you are using an intermarket analysis approach. I suggest you try the following. You may already own this book, but try to get hold of it if you can: Neural Networks for Financial Forecasting, By E Gately. Try this masters solution I found on web:

**DATASET DESCRIPTION** This study implements the model on the stock market indexes from 10 countries. The test dataset are daily forecasts of the closed indexes from 09/04/2000 to present. The training datasets consist of historical daily data from each of the individual market indexes. For the modeling, each single data variable will be provided as input to an individual GRNN model. The input variables used to forecast each index are included below:

- High of the index
- Low of the index
- Close of the index
- One-day lag of the closed index
- One-week lag of the closed index
- Closed/current index from the other 9 markets

The individual models are training on the aforementioned data for each of the

following countries (and corresponding stock indexes): Table 1: Countries with Stock Market Names and Time Zones

Country Index Name

Australia All Ordinaries GMT+10:00 Brazil Bovespa GMT-03:00

Germany DAX GMT+01:00

Japan Nikkei 225 GMT+09:00

USA S&P 500 GMT-05:00

Singapore Straits Times GMT+08:00

Thailand SET GMT+07:00

Turkey ISE National-100 GMT+02:00

UK FTSE 100 GMT

S-Africa Johannesburg All Share GMT+02:00

For simplicity, the 10 markets in the study were grouped by time zone as follows:

Table 2: Countries Grouped by Time Zone

Group I Group II Group III Australia Japan

Singapore Thailand UK

Germany Turkey South Africa

USA Brazil

Group I: To forecast the indexes for day d in Group I, the input consists of: · Indexes

of all ten markets on day d-1 Group II: To forecast the indexes for day d in Group II,

the input consists of: · Indexes of markets in Group II and III on day d-1 · Current

indexes\* of markets in Group I by the time the markets in Group II open on day d

Group III: To forecast the indexes for day d in Group III, the input consists of: ·

Indexes of markets in Group I on day d · Current indexes\* of markets in Group II by

the time the markets in Group III open on day d · Indexes of the markets in Group III

on day d-1 \*Note: in case of the unavailability of real-time data, the closed indexes on

day d will be used. For one country forecast, the neural network is trained with the

time lagged historical data for 700 days of those aforementioned variables. The next

day forecast is then made. For the next forecast the network will be re-trained using

the time lagged historical data for the previous 700 days. The reason of using this

data range results from the

unavailability of data in some countries. The sliding window of days in the forecasting

is shown in the figure 1.

Figure 1. Lagged Historical Data Used in the Forecasting All market index data, used

in this study, are downloaded from the <http://finance.yahoo.com> website in Excel

Comma Separated Values (.csv) file formats. They are then preprocessed, arranged,

and saved in Excel spreadsheet (.xls) format. Dataset is the value of the stock market

indexes. The simulations are designed to forecast the close of each index based on

other index values that may or may not currently be closed. Therefore, due to the time

zone difference, the variables are chosen based on the current time of each market.

For example, to forecast the closed S&P 500 index on

June 13th (Thursday), the 14 input variables will be:

1. S&P 500 high index on June 12
2. S&P 500 low index on June 12



3. S&P 500 closed index on June 12
4. S&P 500 closed index on June 11
5. S&P 500 closed index on June 6 (last Thursday)
6. Closed index from Australia on June 13
7. Closed index from Brazil on June 12
8. Current index from Germany on June 13 (by the time US market opens)
9. Closed index from Japan on June 13
10. Closed index from Singapore on June 13
11. Closed index from Thailand on June 13
12. Current index from Turkey on June 13 (by the time US market opens)
13. Current index from UK on June 13 (by the time US market open)
14. Current index from South Africa on June 13 (by the time US market opens)

Good luck

### **Rel 4 and Stops**

Date :3/4/2003 5:03:05 PM Poster : Maciej

Does anyone know whether the upcoming release of NSDT will maintain the same method of handling stops as at present. That is, it is not possible to get stopped out on the same bar as you go in (in on the open, and out on the close of the same bar or stopped out also on the same bar as entry). This is particularly irritating on a daily periodicity where in the case of volatile movements (in my case futures) I have a high chance of either achieving my target or being stopped out. Currently the only solution that I see is to break the day down into smaller periods. Thanks in advance for any feedback

### **Re: Rel 4 and Stops**

Date :3/5/2003 3:39:44 PM Poster : Webmaster@ward.net

Actually you CAN get stopped out on the same bar as entry. You just can't get stopped out on the same bar as entry if your stop condition relies on knowing the entry price (i.e most of the built in trailing stops). As an example, a stop of  $\text{MovAvg}(\text{Close}, 5)$  will get out on the same bar as entry if the price gets down (or up) to the  $\text{MovAvg}$ . Release 4.0 has no changes in this area.

### **Re: Rel 4 and Stops**

Date :3/6/2003 3:30:48 PM Poster : Maciej

Can I suggest that this be considered for the next release. In the case of daily bars, and entry on Open, this means that one cannot get stopped out until the open of the following day. I would imagine this means that tests in those conditions, ie not using stops on the day of the entry, renders any results less accurate than they could be. In the case of 5/10min bars the problem is less crucial in so far as the likelihood of a stop being triggered in the first bar suggests that the stop was unrealistic anyway. But in a daily bar! If implemented I'd suggest that a worse case scenario be adopted so that if a profit target and a stop loss were both triggered then the stop loss should prevail. The only other way currently is to use say 30 min bars whilst treating all calculations as daily ie multiple time frames.

### **Parameter equality restrictions**

Date :3/7/2003 7:19:51 PM Poster : Yngvi Hardarson

Anyone know if/how I can restrict trading strategy optimized parameter values for long and short trades? I've come to the conclusions myself that this isn't possible in the current version.

Yngvi Hardarson

### **Re: Parameter equality restrictions**

Date :3/9/2003 6:44:34 AM Poster : Xprogrammer

Look for the + where the rules are displayed. Click on it and you will see where you can restrict the parameters in the rule.

### **Re: Parameter equality restrictions**

Date :3/11/2003 5:12:17 AM Poster : Yngvi Hardarson

Thanks.

I know I can fix parameter values and restrict their ranges.

I now realize that I didn't pose my question clearly enough. What I have in mind is say restricting the optimization process in such a way that e.g. the length of moving averages crossovers is equal for the long and short sides of a trading strategy but have their length optimized given that restraint. This could also apply for indicators being created using the Wizard where you want to fix the same period in many places but still optimize that single value. That latter problem can of course be achieved by employing indicators programmed outside NTSP.

Yngvi

### **Re: Parameter equality restrictions**

Date :3/11/2003 5:59:09 AM Poster : Yngvi Hardarson

In continuation of my previous response then I just realized that in my question only seems relevant as far as placing equality restrictions on trading strategy parameters. The ability to Map Variables in Custom indicators is there. However I don't see how I could apply the same technique for a Trading Strategy.

Yngvi Hardarson

### **Re: Parameter equality restrictions**

Date :3/11/2003 1:49:38 PM Poster : Maciej

Your right its impossible to constrain a parameter in an identical manner for both the long and short sides of a trading strategy at the present time. The optimiser will find one for the long side and another perhaps the same but that's not certain for the short side. We have requested the ability to have variables in a wish list in this forum.

### **Optimization rule request**

Date :3/11/2003 10:25:21 AM Poster : Tom Nunamaker

It would be nice to allow rules for optimizations that include more logic such as a rule that parameter X is always less than parameter Y, where X and Y could either be in the same indicator or different indicators. Another useful rule would be to tie an optimized parameter to multiple locations simultaneously. For instance, if I'm optimizing BUY and SELL strategies and I want to use the same values for an indicator for both sides, I would want the optimizer to always use the same number in both situations.

Occasionally ratios or adding constants would be nice too. For instance, if I have two parameters in an indicator X and Y. If I want to use X from 1 to 10 and Y from 2 to 20, but Y is always double X. Or, Y is X+ N where N is what needs to be optimized.

I don't think these are possible currently so consider it a request for a future release. If this is possible to do now, I'd love to know how to do it.

### **Re: Optimization rule request**

Date :3/11/2003 1:55:23 PM Poster : Maciej

Tom, Part of what you want is possible. If you require that parameter X is dependant on the value of Y then that's feasible, essential you create a custom indicator which allows you to link your variables and then you use a boolean for instance: and (crossabove(movavg, movavg2),movavg1length1<movavg2length2) Hope that helps.

### **Re: Optimization rule request**

Date :3/12/2003 3:07:49 PM Poster : Steve Ward

That's clever, Maciej!

### **Re: Optimization rule request**

Date :3/13/2003 4:15:48 AM Poster : Maciej

Taken to extremes I've even managed to stop the optimiser from finding an optimal solution. The method was simply to add more boolean constraints, in my case insisting that the variables in a movavg formula were only Fib values say from 3 to 55: the optimizer couldn't find an optimal solution. It seems that it would be best to have NSDT provide the facilities of variables rather than get us coding these

### **Re: Optimization rule request**

Date :3/13/2003 1:15:08 PM Poster : Tom Nunamaker

Maciej, I'm not clear exactly how you achieve this. Suppose I have an indicator that has two variables where  $Y = 2 X$ . I would create an indicator called "DoubleX" for the sake of discussion. Suppose I'm trying to calculate a MACD and I want:

$\text{ExpAvg2 Periods} = 2 * \text{ExpAvg1 Periods}$

How would I construct the MACD so the optimizer would use the "DoubleX" indicator and keep that 2:1 ratio in the ExpAvg periods?

Thanks

Tom Nunamaker

### **Re: Optimization rule request**

Date :3/13/2003 6:29:04 PM Poster : Maciej

Tom, I've got a custom indicator that should do what you need, you'll need the

ability to save your indicators. Essentially it is  
IfThenElse(A=B(A=Mul2(2,B),MACD(Close,B,A),0)

If you save the indicator you'll be able to link A variables as one, the B variable as one, hide the 2 variable and hide the 0 variable).

This will force NSDT to display a MACD when your condition is true. The optimiser should go through the possibilities and give a MACD that is optimised whilst maintaining your condition.

Sorry the boolean approach is perhaps not appropriate in your instance even if the IF does much the same job as the AND.

I can pass you a tpl but someone will have to tell me how to transmit it.

**Re: Optimization rule request**

Date :3/14/2003 8:08:32 AM Poster : Webmaster@ward.net > I can pass you a tpl but someone will have to tell me how to transmit it.

Just attach your tpl files to an email to forum@ward.net and we will post your files on this thread.

**Re: Optimization rule request**

Date :3/17/2003 10:42:24 AM Poster : Ward.net Webmaster The file referenced in this post can be downloaded using the following link:

[MACDTwoTimes.exe](#)

The file is a self extracting EXE containing two files.

### **Selective Optimization**

Date :3/22/2003 12:55:31 PM Poster : Maciej

When using the Full optimization option of testing a trading strategy it would be very useful if only certain indicators were optimized and not others. The logic being that some indicators are actual triggers for say an entry whilst others are simply there as a representation/constraint of the real world say a rule that insists on exiting at EOD regardless of the result. So say a series of various moving averages could be optimised by rule selection (the parameter optimization is not the issue) whilst the exit rules remained in place. Has anyone figured on doing this with the current release or is this something for a future release? My current approach is to optimize without my "real world" constraints and once I've something promising then to add the non-optimizable rules. That's sort of cheating and I'm not sure if an optimal result can be so obtained.

### **Re: Selective Optimization**

Date :3/24/2003 11:25:07 AM Poster : Eric L. Hoyle, CFA Maciej, I'm not sure if this would work without seeing the actual problem, and it's not easy to use, but couldn't you create combination of rules using the AND indicator that, regardless of the optimization path, would contain the rule(s) you wanted in the end? So if you wanted RULE 1 and RULE 2 to be exit signals, but wanted to use full optimization, you could create a single exit rule that was AND(RULE 1, RULE 2). Would that work? Eric

### **Re: Selective Optimization**

Date :3/24/2003 1:21:39 PM Poster : Maciej

Thanks Eric.

That should work. The only inconvenience is the the small one of enveloping all the rules in the Boolean. One can live with that.

### **Getting a Net to think like a trader**

Date :4/2/2003 5:46:24 PM Poster : Dave Hubbard at Midwest I have developed a trading strategy that works across a variety of markets. I tried putting the same indicators from this strategy into a net. The net found something totally different and it didn't always work out of sample (due to overfitting). How can I get a net to think like a trend-following system (strategy) and possibly improve my existing system if not at least trade similar to the strategy itself? I am wondering would it be a good idea to throw in binary system rules? The turbo prop is not supposed to work well with binary rules so I don't know if I could trust any good results that I may get from this idea. I also have the neural indicators add on. Which nets in the neural indicators might be better suited to this idea? Does anyone have experience in taking an existing trading system and getting a neural net to trade like the system? This could be an interesting thread and any feedback would be helpful.

### **Re: Getting a Net to think like a trader**

Date :4/3/2003 12:39:39 PM Poster : Maciej I've run into "problems" when I've optimised indicators together with stops and exits all together in one trading strategy. My solution has been to separate the entry triggers/indicators (using nets or not) from

the the actual "production" trading strategy where I have my trader's constraints ie \$ stops and such like. This seems to give better results as the nets/genetic algorithms are not contaminated by the real world constraints so the signals are purer. Once I've worked out my entries I then set my stops/exits to my pain threshold. Perhaps you could try to separate some your components so that a part concentrates on say optimising your net and another part handles the trader component.

**Re: Getting a Net to think like a trader**

Date :4/4/2003 10:42:35 AM Poster : Dave Hubbard at Midwest Thank you for your suggestions. I do have one more question for anyone who wishes to answer. How do I take a traditional trading system (such as those found in Trade Station, Metastock, or the templates in the Trading Strategy Wizard) and use a net to improve the system? Any ideas?

**Re: Getting a Net to think like a trader**

Date :4/6/2003 6:01:33 PM Poster : Maciej

Two phrases keep cropping up here as regards to nets: normalize (data) and pattern recognition. There are examples on how best to normalize your data/signals/indicators to ranges of values more easily understandable by nets -essentially that means keeping the ranges under control (there was an excellent article on nets and horse racing that Ward systems made available that showed the beneficial effects of normalizing data). As regards pattern recognition I myself find that the usual  $A > B$  for a standard indicator is less satisfactory than say  $a$  and  $b$  as separate inputs or the ratio of  $a$  over  $b$ . But there is a lot experimentation required. Another way to create a pattern is to use lagged values of one indicator; as an example: the lag of the slope of the price - just provide the values of the slope of say the five previous bars and hopefully the net has a pattern.

**Re: Getting a Net to think like a trader**

Date :5/28/2003 10:11:14 AM Poster : Bertrand Dave, I have also played with the stratgy of advancing binary trading signals through a NN, with a BackProp product for Excel. Of course you then need to introduce trading thresholds to the concept, cause net output function will never exactly produce the original binary thresholds. I then optimized the tresholds, which certainly increased net profit. But since TurboProp does not seem to work so well with binary, you need another solution: Have you tried predicting your basic indicators you use in the trading strategy? This could also be done using some self retraining indicators like the Adaptive Turboprop2 set (which is very effective when combined with the GA in NSDTP). One more hint: Try several experts with different prediction horizons (like 1-2-5-10 bars in the future). Finally you put the different experts into one trading strategy & let the GA find the best setup. Maybe you could post your findings here :- ) Regards Bertrand

### **Turning Points**

Date :4/11/2003 11:42:41 AM Poster : Mark Simpson I'd just like to say, I've been using the new "Turning Points Add-On", and I've found them to be very good. Particularly "Example 4".

The Peakprob/ValleyProb indicators are very impressive.

Regards Mark Simpson

### **Re: Turning Points**

Date :5/22/2003 2:53:36 PM Poster : Michael Stigall I have found the turning point indicators very useful also. Are you using them exactly as example 4 did (buy/sell for a strategy) or in combination with other tools (clustering, neural prediction)?

### **Re: Turning Points**

Date :5/23/2003 12:21:28 AM Poster : zawie

That was a long time ago. I think (from memory), it was based very closely on example 4. Try a TDNN'd Peakprob/Valleyprob as inputs to a net predicting somewhere in the range 3-10 bars ahead. See how well that works, then see if a short term stochastic (again TDNN'd) helps improve it. (Ideally a DiNapoli stochastic, but the regular stochastic won't be far off).

Regards Mark Simpson Bowfort Technologies Inc.



### **Trailing stops based on ATR**

Date :5/6/2003 4:55:12 PM Poster : William I am new to the Trader Pro , and looking for a way to test a trailing stop based on Average True Range multiples . Anyone know how I can program one ?

### **Re: Trailing stops based on ATR**

Date :5/7/2003 10:48:46 AM Poster : Ward.net Webmaster The True Range Indicator is in Advanced Indicator Set 1. However, if you don't want to buy that add-on just for one indicator, the True Range is also available from the tip on this site called: True Range Indicator from Ruggiero Articles (3/8/1999)

### **Re: Trailing stops based on ATR**

Date :5/13/2003 8:21:07 AM Poster : William Now that I have added the True Range Indicator , how do I implement it and multiples of it as a trailing stop ?

### **Re: Trailing stops based on ATR**

Date :5/13/2003 2:02:22 PM Poster : Ward.net Webmaster The way trailing stops work, is you insert an indicator where it says "Price level" in the trailing stops tab. Although we don't know what theory you are trying to implement, we suppose you could place a trailing stop of N times the True Range below the current close for a long. So say N is 3, you'd make the following indicators:

Close - 3 \* True Range (for a long) Close + 3 \* True Range (for a short)

Then on the trailing stops tab of the Trading Strategy, you'd insert those new indicators where it says "Price level" If that isn't the theory you are trying to implement, please explain what the theory is.

### **Re: Trailing stops based on ATR - New Question**

Date :5/14/2003 3:10:33 PM Poster : Greg Along the same lines, how could I insert a stop that is not trailing? I would like to develop a Trading Strategy where I use an indicator which for an Entry Condition places a stop below (or above) the entry price, and the stop price will remain at that level until either an Exit or Stop is triggered. ex. I want to put a stop in of 2N(my indicator) when my entry is triggered. 2N currently is 4 points, stock is at 50, I want a stop placed at 46 and to stay at 46 until I'm stopped out or exited.

Any help is appreciated. Thx

### **Re: Trailing stops based on ATR - New Question**

Date :5/16/2003 8:51:45 AM Poster : Maxwell Craven

Ward calls them trailing stops but they don't have to be trailing. You can use any price. Check out the category called protective stops, I believe. There are some in there that stay a fixed distance from entry price. There's also one somewhere called value when entry activated that you could use to capture the value of your 2n when the entry is triggered.

Close + 3 \* True Range (for a short)

Then on the trailing stops tab of the Trading Strategy, you'd insert those new

indicators where it says "Price level"

If that isn't the theory you are trying to implement, please explain what the theory is.

### **Re: Trailing stops based on ATR**

Date :5/23/2003 9:03:57 AM Poster : William

If the market were to go slowly down day by day [ say minus 1 ATR each day ] , would my 3\*ATR stop be triggered on the third day ? I want my stop to get tighter but never looser . When inserting a new indicator on the trailing stops tab , does the programmed stop automatically trail at the highest price [ for a long trade ] that the 3\*ATR multiple below the close reached [ while never receding ] ? And what if I DID want the stop to be based only on the last day's close , and tighten or loosen accordingly [ I am still experimenting as to my preference , though I am leaning toward the initial theory ] ? On a related point , I would like to explore using ATR multiples as price targets . I am thinking that I would then use something very similar to the trailing stop indicator I have been discussing , except of course I would enter it in the price target [ or exit signals ? ] tab instead . Such as :  $\text{Close} + 3 * \text{True Range}$  [for a long] , and :  $\text{Close} - 3 * \text{True Range}$  [for a short] . This would of course depend on the answer to the above question regarding a stop perpetually tightening without loosening , because I would similarly wish a price target to perpetually tighten without loosening . And , also as above what if I DID wish the stop to tighten or loosen day to day ? Forgive me if these are "simple" questions , and I have therefore been too thorough in my explanations [ or "complex" questions , and I am therefore potentially taking a lot of someones time in order for them to answer ! ] . I thank the forum members for their patience and earnestly hope that I am not the only one gaining by this thread !

### **Re: Trailing stops based on ATR**

Date :5/27/2003 1:09:08 PM Poster : Ward.net Webmaster

> Does the programmed stop automatically trail at the highest price?

Many of the ones we provided do trail, but we can't automatically make your custom ones do that. Yours use only the last value and will therefore tighten and loosen according to your formula.

However, we've provided indicators so you can make your indicator trail. Just use the `MaximumValueSinceEntryActivated` or `MinimumValueSinceEntryActivated` indicators in your formula (Max for long position stops and Min for short position stops).

> I would like to explore using ATR multiples as price targets

Just remember that unlike trailing stop indicators, exit signals must be true/false and therefore your price target should be something like  $\text{Close} \geq \text{Close} + 3 * \text{TrueRange}$ . You should also use the `MaxSinceEntry/MinSinceEntry` indicators described above if you want the price target to always tighten without loosening.



### **The Alpha in stocks**

Date :5/6/2003 10:54:37 PM Poster : Khean

1. In stock technical analysis, we often hear about the Beta, but less so about the Alpha (the point on the Y-coordinate).

1. Unlike Beta, for which we know what it means when say, the Beta is 0.8, we don;t know what the Alpha value means.
2. Does anyone know how to intepret Alpha quantitatively? What time period is suitable for a good Alpha Indicator?

Thanks

### **Re: The Alpha in stocks**

Date :5/7/2003 10:18:34 AM Poster : Marco Calzolari

It is the result of a linear regression between a stock and the index, calculated on their daily or weekly percent changes. The Beta is the slope, the Alpha is the intercept, or in other terms, it a (daily or weekly) percent change in the stock that is not explained by market movements. Positive Alphas are positive for the stock. Suitable time period: same as Beta. Academics would say at least 5 years based on weekly changes, I would say at least 5 days ;- ) It is anyway an indicator of what happened in the past. If you use Alpha in a trading system, why not search the best time period with the genetic optimizer?

### **Re: The Alpha in stocks**

Date :5/7/2003 10:51:59 PM Poster : Khean

Thanks Marco. Can I ask additionally:

- (1) Does it mean a stock with an Alpha of 3 is stronger and has more potential than one with an Alpha of 2?
- (2) What about stocks with negative Alphas?
- (3) Or is a change in Alpha more relevant than its absolute value for purpose of analysis?

### **Re: The Alpha in stocks**

Date :5/8/2003 11:07:03 AM Poster : Marco Calzolari

1) Yes 2) They are dogs; they might even rise with the market if they have a high Beta, but you are taking a bigger risk for your reward. 3) Sure, I would search for high and positive alphas, and possibly for an indicator which could forecast future alphas.

### **Re: The Alpha in stocks**

Date :5/8/2003 1:19:22 PM Poster : Ward.net Webmaster

We should add, in case people haven't noticed it, we have a tip on this site with alpha and beta calculations in a chart.

### **Longer term nets**

Date :5/8/2003 8:33:02 AM Poster : Dave Hubbard at Midwest

It seems like the only good nets that I can develop have an average trade span of 5 bars or less. Has anyone been able to develop a decent neural net that might only trade once a month? If so, what steps have you taken to develop a net like this? I am just curious as to what other users experiences might have been. I have had some mixed successes and failures in changing the average trade span settings.

### **Re: Longer term nets**

Date :5/9/2003 8:44:43 AM Poster : Xprogrammer

I have two ideas on that. One is try weekly bars and the other is try increasing costs (commissions and slippage). Tell me how those ideas worked.

### **Re: Longer term nets**

Date :6/12/2003 8:10:05 AM Poster : Doug B

For mutual funds using weekly bars and the Neural Net add-on I have generated excellent longer term signals.

### **Threshold optimization**

Date :5/8/2003 9:51:21 AM Poster : Dave Hubbard at Midwest I have recently made some decent nets using the full optimization in the prediction wizard. Since I was optimizing for both inputs and parameters, I left the entry and exit thresholds at zero. Upon looking at this net, my boss brought up a good point. He said he would like the net much better if the entry and exit threshold were different to avoid excessive whipsaw when the prediction curve is too close to zero.

My experience with threshold optimization has been that it many times will find values that cause the net to always be in the market. Without changing the net to an optimal buy sell hold style net, I was thinking this problem could be solved from 2 angles:

1. I could look at the prediction curve after the net was created and manually put in my own values.
2. I could preset the values and recreate the net and hope that it finds a curve that trades around those values. I am wondering some other user's might think about either of the two ideas. Thank you, Dave

### **Re: Threshold optimization**

Date :5/13/2003 8:30:05 AM Poster : Ward.net Webmaster You have reasonable ideas. Our suggestion -try both and see what works best.

### **Wavelets and Fast Fourier Transforms**

Date :5/13/2003 1:35:48 PM Poster : Dave Hubbard at Midwest Are there any websites or books where I might find information on these classes of indicators as to what they mean and what the parameters mean explained in a simplified manner? These indicators look like they have potential but I want to understand what they are doing first before I start putting them into nets. Any references or explanations would be appreciated! Thanks, Dave

### **Re: Wavelets and Fast Fourier Transforms**

Date :5/13/2003 1:48:27 PM Poster : Ward.net Webmaster The help file for the wavelet indicators gives the reference we used in coding the indicators. For FFT, you'll have to go to an engineering textbook - it is a very complicated subject.

### **Re: Wavelets and Fast Fourier Transforms**

Date :5/13/2003 11:16:26 PM Poster : Mark Simpson

I've found limited use to FFT's, mainly because to remove the high frequency noise which is created by the disjoin between the 2 ends of the sample length, people normally apply "bell-type" curves (usually a Hanning window). This causes the ends of the sample to be zero.

Unfortunately, one of those zero points is "Now". I.E. Exactly the point you're trying to model with accuracy, you've just wiped out by the constraints of the analysis. This introduces a form of End Point Distortion. I've seen some articles which attempt to predict with FFT's, but skirt around the EPD problem, which, to me, seems a pretty darned big issue.

I do have a suggestion that may help (I haven't tried it myself yet though). When you scan a document, you may not get the page square to the scanner, but most scanning software will rotate the page for you, so that everything lines up. Think of an fft the same way. I.E. Take the beginning of the sample (lets say it's \$95), and the end of the sample (\$106), and calculate the slope of the line between them. Then rotate price by that slope, so that the beginning and end are the same price. Then subtract the offset (constant) from price so that it starts and ends at zero. Then you can dispense with the hanning window altogether.

The rotation would introduce some low frequency noise, but the advantage of doing this verses the EPD problem from the hanning window, would likely be preferable.

Regards Mark Simpson Bowfort Technologies Inc

### **Re: Wavelets and Fast Fourier Transforms**

Date :11/22/2003 2:00:23 AM Poster : Eric Hansen I'm a new purchaser, trialing the product and just reading the forums, picking up on the cool topics.

Really an academic question on the FFT. Seems like I remember thinking the cosine/sine transforms would be better due to more flexible boundary conditions when I was studying applied partial diff. Instead of symmetric requirements on both ends you have restrictions on the derivative which you could possibly fake out by modifying the data point that is at the end of the data set, rather than the messing with the most recent data point or modifying all of the data points.

Just a thought, would be pretty easy to implement. Thanks, Eric

**Re: Wavelets and Fast Fourier Transforms**

Date :11/24/2003 10:45:42 AM Poster : Maxwell Craven I don't know anything about FFT, but the redundant haar wavelet that is in the Ward plugin is asymmetric so that there is no problem with the right edge. However, if you decide to implement your FFT idea I'm sure if you post it here many of us will try it and give you feedback.

**Re: Wavelets and Fast Fourier Transforms**

Date :5/20/2003 4:57:53 AM Poster : bruno Hi,

I can recommend this tutorial

:<http://engineering.rowan.edu/~polikar/WAVELETS/WTtutorial.html>, which describes why Fourier transforms are not generally suitable to financial times series, simply because data is non-stationary. Wavelets do overcome some FT limitations, but most often also suffer from End Point Distortion.

Regards Bruno

**MESA2002**

Date :5/31/2003 12:25:54 PM Poster : Richard Nowak

What do you get with MESA2002? 1) I'm assuming you get one or more DLLs. What are they? 2) I'm assuming you get template files. What are they? Are they password protected? 3) What documentation do you get with it? 4) Has anyone tried to implement any of the coded examples from the book "MESA and Trading Market Cycles?" which makes calls to the DLLs? I plan on converting the EL code to PB for use in NSDTP. 5) Do I need to specify anything other than its targeted use is NST when ordering? 6) Any other information about it is appreciated.

Since the software is not returnable, I want to get a greater understanding of it than what is provided on the website.

TIA,

Rich

**Re: MESA2002**

Date :5/31/2003 2:55:50 PM Poster : Michael Begley

I would also be interested in hearing if any NST users found MESA indicators useful in any of their profitable production systems.

I also have TradeStation code for one of Ehlers' earlier books and planned to check out its usefulness in that environment before purchasing anything additional or doing any DLL coding for the NST environment.

Thanks.

Mike Begley

**Re: MESA2002**

Date :5/31/2003 6:55:23 PM Poster : Richard Nowak

What I've learned: MESA2002 is a collection of indicators based on the MESA measurement of the Dominant Cycle. There are seven indicators. Each has a TPL file, and the TPL files are open (no password). There is a DLL associated with each TPL. Reading the TPL files gives you the means to see how the DLLs are declared and called. The indicators are: Dominant Cycle, Kalman Filter, Instantaneous Trendline, Sine, LeadSine, Phase, and Market Mode. No programming documentation is provided and John does not have the resources to provide programming support. However, his book "MESA and Trading Market Cycles" should be sufficient. Anybody have any recent experiences with these indicators? Rich

**Re: MESA2002**

Date :6/17/2003 3:55:04 PM Poster : Maciej

If you are using ESignal then you could try Mesa as part of Esignal before you commit.

I've bought and tried MESSA2002 for NSDT but have been unable to use it to benefit me in my futures trading.

In answer to your questions:

Yes there dlls and also tpls for calling the indicators from NSDT.. The security system employed by Mesa has not been an issue. The Mesa software is a series of



indicators as explained in the documentation provided with the the software. This documentation explains how the indicators work together. The doc is based on the stand alone Mesa product (functionally the same, graphically more explicit).

My lack of success is perhaps due to the fact that I did not use the book relying only on the doc provided with the software: frankly an error on my part.

When ordering make sure that you get the latest release as I've gone through one upgrade.

I'm not sure about using the supplied dlls other than with NSDT - you should check with the supplier as to the possibility.

**Re: MESA2002**

Date :6/24/2003 1:07:02 PM Poster : Kermit

My first post here, so we'll see how it works.

I have had MESA for several years now, and haven't bothered to try it in the Trader. It still has problems even reading some of the data contracts I build. My opinion only, but I think it is a much hyped software that has very marginal usefulness. I have used cycle analysis for about twenty years now, and I think that this software has very imited value.

If anyone is interested in cycles, I would suggest reading James Gleik's book CHAOS. It is not specifically about markets, but there is a section in there that shows how cycles work, and why they are so difficult to use - especially to actually quantify.

Again, I haven't actually tried the MESA indicators in the Trader, and if someone does, I would be interested if they are indeed useful.

**Re: MESA2002**

Date :6/25/2003 11:20:35 AM Poster : Russ Koester

I do not have the experience that Kermit has but I also have not been able to use MESA.

**Re: MESA2002**

Date :6/27/2003 3:25:21 AM Poster : Nalin Pasricha I've had it for about a year, and it hasn't worked for me either. However, I feel I must be missing something, because R-MESA 3 has been on the top 10 list of Futures Truth for quite a while. One way of using MESA which seems to have promise, doesn't seem possible to implement on NST. That is, using the length of the dominant cycle (or a fraction thereof) as the parameter for another indicator. If anyone knows how to do this in NST i'd be interested to know.

**Re: MESA2002**

Date :6/27/2003 3:25:00 PM Poster : zawie >One way of using MESA which seems to have promise, doesn't seem possible to implement on NST. That is, using the length of the dominant cycle (or a fraction thereof) as the parameter for another indicator. If anyone knows how to do this in NST i'd be interested to know. Adaptive indicators will achieve this task, you can use the length of the dominant cycle as an adaptor to adapt the underlying indicator. Ward Systems have "Advanced Indicators Set 2" which contains an adaptive indicator called "Variable Length Moving Average". You can download an adaptive version of the

Mass Index for free on this forum, or buy a separate adaptive pack (Bowfort Adaptive Indicators 1) from me if you need more indicators. In the indicators I've written, you don't have to worry about a fraction of the dominant cycle, as scaling is taken account of automatically. Regards Mark Simpson Bowfort Technologies

**Re: MESA2002**

Date :6/30/2003 10:44:13 PM Poster : Ng Tian Khean I have tried out MESA even in it's stand-alone form. In my view, it is too simplistic. Even dominant cycles are hard to identify and measure because of non-linearities in the cycle process, and the Chaotic nature of cycles. The results of MESA look pretty, but don't bet your buck on them. Ehler's mathematical prowess is undeniable, but here we are trying to quantify things which cannot be quantified yet even with today's computer power.

### **trading the equity curve**

Date :6/7/2003 1:39:37 PM Poster : sylvain gauthier It is logical that if we trade the long or short equity curve that is go long is the equity curve is growing (equity greater than moving average of equity or else) that we should get much better returns than not doing it. The perfect system should only trade valid prefiltered signals based on the past and current profitability of each subsystems. Try an experiment : 1- build two simple trading systems : one for trending markets and the other for oscillating markets 2- Compute the long and short equity curves for each systems 3- Use the trading strategy wizard to go long if the long equity is growing and go short if the short equity curve is growing 4- Weird but you will get lower returns. Is it a bug or bad programming 5- Is there any other way to compute the filtered equity curves 6- Note that if you use the conditional cumulative sum you can get higher retruns but not with the trading strategy wizard. The cumulative sum will not comute the returns from the beginning of trading 7- Note also that the fuzzy indicators dont allow for a variable max. Real life that max is variable I am expecting comments and suggestions before I consider that it is totally illogical to get lower returns when you avoid the biggest part of a drawdown. 8- It is possible to minimize the probabily of ruin with NST and the optimal positions

### **Re: trading the equity curve**

Date :6/11/2003 11:02:08 AM Poster : Bertrand Hi Sylvain, I intend to know what your are talking about. I was fascinated by the the same idea some time ago: use smart systems that automatically switch rules according to their own efficiency. I tried this out to the core programming a theoretically equity in TradeStation & also did this graphically to increase the confidence in the results. But to my suprise it is really not working that good, because of the following: In order to lower drawdown through equity curve filtering the system should have a low serial correlation of trades. For a good, not curve fitted system that runs on more than one specific market and/or timeframe this should be the case. With such an approach you get lower returns, because the system itself it not predicting a switch in rules, but is lagging in changing its behaviour. This means if market suddenly changes to another state, you will get a the high drawdown from the original rules until switching AND you will probably miss the a big move until your system switches again (this is more important for a system that is designed to be completely inactive in DD phases). I guess you could simply build a prediction to predict a moving average of the trading system equity curve & incorporate that as a filter into a second trading system (just make sure you have optimized the system before you take this step). All the best Bertrand

### **Using one trading strategy as input to another**

Date :6/23/2003 5:10:56 PM Poster : Maciej Has anyone tried using the entry signals generated by one trading strategy as input into a second strategy, ie "trading strategy Long Entry Order#1" as the indicator in trading strategy #2? I use this to separate the entries from my stops, the first trading strategy generates all the entries, whilst the second optimizes only the stops. Its my way of avoiding the entries being influenced by the the stops during optimization. Would you agree that the number of entries should be identical in both trading strategies and only the exits would differ? Perhaps there is another way of doing this ie having stops that won't influence the optimiser:- if anyone can advise?

### **Re: Using one trading strategy as input to another**

Date :6/24/2003 9:27:16 AM Poster : Maxwell Craven

I don't think I'd agree that the entries would be identical. If the exits differ, then the next entries could differ too. If you don't really want to optimize stops I guess you could set your min max values tight for the stop indicators so they don't optimize.

**change the prediction objective**

Date :6/28/2003 5:17:33 AM Poster : Ren Yu

I run some experiments to compare the prediction ability of traditional backpropagation neural network and NeuroShell Trader network. I could change the prediction goal for example, I could set the training goal is  $MES = 0.05$ . However, for NeuroShell Trader, I could not do the same thing. I could only set my prediction object to 'minimize MSE', however, the prediction result shows that the training error is 0.8. What should I do if I wanna get a smaller value for this 'training error'? Can I set it somewhere? Does it mean that this is the smallest MSE value I could get by using the Trader? Thanks!

**Re: change the prediction objective**

Date :7/2/2003 8:52:20 AM Poster : Ward.net Webmaster

The best way to reduce prediction error is to make sure the number of hidden neurons is set to the maximum of 80, both for training and optimization. However, the best prediction error doesn't always result in the best generalizing nets. If you overfit the training, the net won't predict well into the future unless you have darn relevant inputs, something pretty hard to find for financial market prediction. For that reason, NeuroShell Trader (unlike our other software) is not set up internally to make the absolute tightest fits possible, even with 80 hidden neurons. It is set up to generalize well internally. It is always a mistake to judge nets by training error, in scientific models.

**Going into production...**

Date :7/12/2003 3:40:03 PM Poster : JLF How do you know you are ready to go with a model?

**Re: Going into production...**

Date :7/14/2003 1:49:34 AM Poster : Nalin Pasricha I usually run two kinds of tests before putting a model into production.

The first is to run the model on a different period of time than the one used to develop the model. For instance if I have developed a model using the time period July 2001 to June 2003 as the out of sample period then i'd also test it on, say, July 1999 to June 2000. This is because while developing a system, many of us do repeated runs on the same out of sample period with small changes to the system –inadvertently turning our 'out of sample' period into an 'in sample' period.

The other test is to see whether the model runs on issues besides the one for which the model was developed. For instance, if the model has been developed for the S&P 500, I'd also check to see if it worked on the Nikkei (without further optimization).

**Re: Going into production...**

Date :7/14/2003 2:22:42 PM Poster : XProgrammer I just follow the advice I got from Steve Ward, it may have been from the advanced class, I don't rememeber. He said look for buy signs near valleys and sell signs near peaks and then go trade. That seems to work for me, except I'd add make sure the trading frequency looks appropriate for what you like.

### **selecting profitable output variables**

Date :7/18/2003 12:05:05 PM Poster : MFK Lots of discussion at the forum about inputs, parameters, etc. I'd like to get a discussion started on what experience tells me is a far more important topic: output variables. Here's my experience: I'm pretty good at developing nets with high forecast accuracy—excellent stats for average error, % correct sign, etc. For my own amusement, I've even tracked two nets over time using 95% confidence bands, looking five days out. The forecasts walk those statistical paths with uncanny prowess. But none of that means the nets are going to be profitable. In this context, I define profitable nets as those that meets three requirements:

1. The net makes money after allowing for commissions, slippage, etc.
2. The money made exceeds that of a simple buy-and-hold strategy.
3. That excess gain fairly compensates me for the time spent developing nets and their accompanying trading strategies. The first two requirements are a challenge in themselves. But requirement three is often a real enthusiasm killer. Let's say, for example, I've developed a reliable net for forecasting a 10-day percent change in the open. It makes money, satisfying requirements 1 and 2. So far, so good. Then I go back and calculate what I would have made if I just traded the 10-day percent change without a forecast. The results seem to be random: sometime the net does better, sometimes worse, sometimes there's no advantage either way. When the net does better, it's usually because it got me into a trade before a breakout. But even then, the added profit from

being in a trade early may not be particularly significant. Maybe I make a couple of extra percentage points. And that's when I ask myself that poignant line from what I think was an old Peggy Lee ballad: Is that all there is? So my net fails me on requirement three. Am I the only one wrestling with the problem? I'd like to hear from others on how they go about developing—or selecting—output variables that can give net builders a meaningful trading edge.

### **Re: selecting profitable output variables**

Date :7/18/2003 4:21:29 PM Poster : chris wong try using neural indicators then you don't have to worry about output variable because there aren't any. the whole worry becomes a non issue.

### **Re: selecting profitable output variables**

Date :7/18/2003 5:20:38 PM Poster : Maxwell Craven I agree with Chris Wong, the neural indicators are great and solve many problems. However if you don't own them have you considered using those optimal outputs?

### **Re: selecting profitable output variables**

Date :7/18/2003 5:59:21 PM Poster : Maciej  
You are not the only one MFK.

I too seem to be able to develop great looking nets but they don't necessarily stand the test of time and ceratinly it is a time consuming process. Even with all the automation that one has in NSDT, it still can take a lot of time and its not the processing that I'm complaining about -its seemingly minor issues as whether its better to select 1 or n walk forwards, which indicators to reject based on the predictions input %, how far back should one test. I've used neural nets succesfully

in other fields but in trading it is a real challenge. It would be interesting to know how many users use NSDT's neural features for actual trading compared to many of us who I suspect use the product as a straight forward technical analysis package.

**Re: selecting profitable output variables**

Date :7/20/2003 3:00:24 AM Poster : mstigall I've used TradeStation and several other high-end technical analysis tools. They don't hold a candle to the optimization tools available in NeuroShell Pro (NSP). IMHO NeuroShell Pro beats them on just the technical analysis + optimization alone. I've programmed several TradeStation optimization studies that could drag on for days! The same studies in NSP take less than 1/4 of the time for equivalent results. My recommendation is to fine-tune your input selection using the neural network predictions and the weighting factors to find out which inputs are best for the present market conditions. Then use the resulting neural network's prediction as the input to a trading system. I've had some excellent results using the clustering add-in on several different technical indicators without neural prediction, too. I still use the neural network weight method to eliminate bad vs good inputs, and then move to clustering. Bottom line - you have to spend some time doing the homework before your systems pay out. No one gets a great system out of the box without some sweat equity involved. When I was starting out, both Steve Ward and Marge were excellent resources for getting around a problem or issue. Best of luck on your quest!

**Re: selecting profitable output variables**

Date :7/21/2003 10:41:50 AM Poster : MFK Some responses to the problem of selecting a profitable output variable, but so far no real revelations, no "aha" insights, no specific directions to follow. A summary to date:

1. Chris Wong and Maxwell Craven suggest avoiding the issue completely, opting to go on "auto pilot" as it were, using the Neural Indicators add-on to select indicators and parameters for a more or less "black boxed" output.
2. Mstigall sort of goes down a similar side road, using the Clustering add-on to configure indicators that have been sorted and weighted using a neural network (TurboProp 2 I presume).
3. Maciej finds himself in the same bind I do: satisfactory nets, less that satisfactory profits for all the effort. He further suggests that a lot of us aren't even bothering with neural net predictions; instead we're using the power of NST to do better at traditional technical analysis. My responses:

1. I own and use Neural Indicators. Overall, I've had mixed results: Outstanding trades with good returns, low drawdowns, excellent profit to loss ratios; unfortunately, these trades are usually followed by a series of whipsaw trades that give a lot of the profits back. So Neural Indicators seem to be good for trend following, but a disaster in a trading range. (I can change the results, of course, by tinkering with the indicators and their parameters, but then I've committed one of Steve Ward's cardinal sins of neural net development, turning my out of sample data into in sample, while pretending that it never happened.) One way I have had some success with Neural Indicators is by incorporating the results of a previously developed TurboProp 2 net. If the net has



reasonably good accuracy results, I will use it plus several momentum derivatives of the net as a Trading Strategy input. That often makes a major differences in profit results.

2. I have the Clustering add-on also, but that's not a tool I'm quick to pull out of the tool box. My experiences suggests it would be excellent given a specific trading style and the patience to develop a dozen or so clusters, each one looking for specific entry/exit conditions. In my use, I've gotten some great entry and exit signals; by the same token I've also missed some great trades because I didn't have the clusters in place to recognize other profitable conditions. What I find more interesting in Mstigall's post is that he still uses neural networks to create or identify the indicators he'll ultimately use in clustering. That's not too unlike my use of nets to develop Neural Indicator inputs. In short, he and I still rely initially on the creation of a profitable--or near profitable--output variable.

3. Is Maciej right? Are great numbers of us using NST as an next generation technical analysis program and ignoring the entire process of developing neural nets? It would be interesting to hear from some of you. I think Maciej is on the mark; my initial post in this topic raises the possibility that this might be the more effective way to use NST.

But I don't want to give up on what I feel is the real potential of neural net forecasting. So any more thoughts on that critical first step: How--what process would you follow or do you follow--to develop robust, reliable and profitable output variable?

**Re: selecting profitable output variables**

Date :7/21/2003 1:41:37 PM Poster : Steve Ward

I actually developed Neural Indicators exactly because I believed neural nets shouldn't have to be able to predict something to be useful, and that users shouldn't have to figure out what to predict. If you own Neural Indicators, you should use them, especially given your problems with outputs. You seem to be thinking that eliminating outputs is somehow cheating by using a "black box". I don't follow that at all, unless it is another problem analytic people have in addition to the following:

Most of our users are very analytic, or they wouldn't be able to use NeuroShell Trader Professional. I think the big problem all analytic people have, including myself, is unrealistic expectations about their trading systems, and an unconscious obsession to seek perfection. I've told many of you about one of our most successful users - a Fortune 100 company investing hundreds of \$millions of their pension funds every day using our net's predictions. Their nets beat ALL the in-house traders. Guess what - their nets only get 70% of their trades right!

Less analytic but highly experienced traders know there are going to be losses and are happy as can be if they have technical systems that get 70% right. My own systems (most built with neural indicators) are even a little better than 70% right, but I still agonize over the losses because I am first and foremost an analytic math/neural net person. I know that as powerful as nets are, it is

very, very difficult to find leading indicators, and impossible to find consistent ones, and that no system of any kind works well all the time, or even most of the time. Nevertheless, I have not fully gotten it through my head when it comes to my own money that being profitable in the market is about probability and averages.

But I am getting much better, even getting to the point where I no longer even test out-of-sample - ie, I optimize my Neural Indicators right up to the end of yesterday so I can get all the critical recent moves! Then I reoptimize any day in which the signals are mostly wrong.

The bottom line is every user of a trading system has to guard against being too precise and accurate.

**Re: selecting profitable output variables**

Date :7/21/2003 3:12:03 PM Poster : MFK Ah, we're getting somewhere. Steve, I'd like to respond to some of your points, then, if you have the time, get your followup to the ideas raised.

1. "I know that as powerful as nets are, it is very, very difficult to find leading indicators, and impossible to find consistent ones, and that no system of any kind works well all the time, or even most of the time." I'm not trying to be a smart aleck with this question, but it's one that comes immediately to mind. Given what you say, why isn't the Neural Indicator algorithm the core of NST? Why is the focus on TurboProp 2, which requires an output indicator that's not going to give satisfactory results "most of the time?" As I said, I'm not being smart-alecky. I happen to agree with what you've stated, not because I'm a math/neural net person; I've just used neural nets long enough—Ward Systems products mostly, but others as well—to know predicting chaotic processes such as financial markets is going to be extremely difficult at best.
2. "My own systems (most built with neural indicators) are even a little better than 70% right . . . ."

Without giving away your hard-earned secrets, can you tell us how you develop these Neural Indicator nets. From your other comments, my guess is you don't start by developing a prediction. Instead, you start by developing a Trading Strategy into which you feed Neural Indicators. What inputs do you feed to the Neural Indicators (generally, of course)? Do you in any way constrain the number of inputs (and their parameters) used in an individual Neural Indicator? How many Neural Indicators will you insert into a trading strategy? As a math person, are you at all concerned about the degrees of freedom involved in, for example, a simple Jump 4C indicator, which, if I counted right, could involve the optimizing of up to 20 factors. Do you add standard indicators to the trading strategy as well as Neural Indicators?

I sure would appreciate as much as you'd like to share on this topic. I'm also sure all other readers would feel the same way.

3. "But I am getting much better, even getting to the point where I no longer even test out-of-sample -ie, I optimize my Neural Indicators right up to the end of yesterday so I can get all the critical recent moves! Then I reoptimize any day in which the signals are mostly wrong."

Many years ago a representative of another company—I want to say a neural net company, but technically, they weren't; I believe the company's name was AIM, and its forecasts were the result of some form of mathematical chaining—answered a question I asked about frequency of retraining nets with this comment: “Why would you wait? Why wouldn't you just retrain them every night or every other night, getting the benefit of current changes in the markets?” Until today, I thought he just didn't have the confidence his product could produce reliable results. Your comment—or more precisely, the extensive experience that leads to your comment—most certainly will force me to reevaluate my whole approach.

Thanks for you insights.

**Re: selecting profitable output variables**

Date :7/21/2003 5:59:17 PM Poster : Steve Ward

I don't agree that Turboprop 2 isn't going to give satisfactory results most of the time. I've built some very good models with it, and it is technically far superior. But as you point out, there are a lot more choices regarding what output to use, maybe an infinite number. NI lets you concentrate on inputs only. NI also has some disadvantages, the biggest of which is that it is very slow, and gets even slower with more inputs. Not so with Turboprop2. A more advanced NI may someday be in the Prediction Wizard, but for the time being can't we make a little extra money selling addons, like car companies sell chrome wheels and leather seats? The nice thing for us is that we can use other programmers to build addons without putting a burden on the NeuroShell Trader programmers, who have much bigger fish to fry than addons. In fact most of our addons were built because I wanted something new to use in my own trading, and I figured why not sell to others what I built for myself?

I just use one NI in a buy rule and another in a sell rule. Usually the only other rules I use might be time rules (get out at 3pm, for example). I don't use any exit rules because that's too many weights to find. I feed in standard indicators, or turning points. NI constrain their own inputs, because they don't allow many. I use release 4.0 and let training go several hours. NI have such an inefficient training mechanism that it takes that long to train sometimes, and there is less danger of overfitting for the same reason.

But in the end, NI aren't a magic bullet either, because there aren't any. That's why we have a toolkit with lots of options. Our website tells people that if you want a turnkey moneymaker, buy software from someone else. You'll be much happier with realistic expectations.

**Re: selecting profitable output variables**

Date :7/21/2003 5:54:16 PM Poster : Maciej Steve, Perhaps an example chart that you have with these 70% wins would serve as a good example to all of us.

**Re: selecting profitable output variables**

Date :8/16/2003 12:18:36 PM Poster : mstigall Just to clarify or "expound" a bit more. I'm very comfortable with several schools of technical analysis, and fond of Bollinger Bands and MACD. I can use those two tools in a plain Excel spreadsheet to trade profitably. My chemical engineering background used statistical process control charts (very similar to BBAND). My emphasis now is bioinformatics, and we use clustering quite a bit to find group similar protein families together, etc. The point is that knowledge of the underlying systems (BB, MACD and clustering; strengths and weaknesses) still helps you create a profitable system. I'm comfortable using the tools because of long exposure to their methods; applying the methods to the stock market works too. How are you selecting the stocks to run the NN on? Since I love the BB, I find stocks that provide a good profit with a non-optimized BB system. Consider the stock selection to be the first step in a filter process, where you try to end up with reliable inputs and outputs.

**Re: selecting profitable output variables**

Date :8/16/2003 12:35:04 PM Poster : mstigall Reading your third point - we differ there quite a bit. I'm a middle-aged over-analytical professional computer nerd . When I started this little path to knowlege over twelve years ago, I mapped out the terrain. Start with stocks, moving into stock options; finally commodities and futures. The path was based on the amount of experience and knowledge I thought each additional market would require. It took me quite a while to get to the point that I felt extremely confident with the stock market and began to tackle the option learning curve. Each year, I start out with \$5K of "mad money" for my training. At the end of the year, I put profits into long term "buy and hold" investments and start the next year with \$5K seed money. I set a goal for average returns per month (after broker fees) and strive for it during the year. Some day I may be able to just do this for a living, but in the meantime I view the process as "training for my retirement". If I make mistakes now, I can recover easily because I have a full-time job. In fact, if I lost the whole 5K, it wouldn't affect my daily lifestyle at all (just my ego). So you talk about how criteria #3 is never satisfied. Your time is never reimbursed. What if you found out that it took ten years of homework and training (your time) to end up with a reliable and profitable system that lasted the next fifty years of your life? And for the fifty years the market won't remain static - your methods will need to adapt and change in different market conditions. Take a longer term view. Most forms of career training (college, etc) take years to complete. Why should home-based trading be any different?

### **Trading Systems for the COMP and DJIAA.**

Date :7/21/2003 12:45:00 PM Poster : Bob Hello Everyone I retired last year and am working to keep my retirement afloat. My retirement is closely linked to the COMP and DJIAA. I am trying to develop a Trading System for the Comp and Djiaa with my NeuroShell Professional. I have not been very successful up to the present time. Do you have any suggestions or can lend some help? Thanks Bob Swihart

### **Re: Trading Systems for the COMP and DJIAA.**

Date :7/21/2003 5:09:30 PM Poster : Steve Ward Since you own Neural Indicators and Turning points with Trader Pro, I would build a trading strategy with Recur4. I would feed it the following indicators:

1. Peak probability (% change) - Valley probability (% change)
2. Peak probability (bars) - Valley probability (bars)
3. Close-open
4. Close-lag(1,close)

If that doesn't work well, try adding two more similar indicators and use Recur6. Give the Neural Indicators a good long time to optimize using release 4.0, maybe 3 hours or so.

### **Re: Trading Systems for the COMP and DJIAA.**

Date :7/31/2003 9:56:16 AM Poster : Maciej Steve, I wonder how you'd advise handling the situation when running the back testing up to the close of the previous session, ie for 31st, back testing goes all the way to 30th and the back test gives you a trade say just before the close of 30th. Do you advise taking that trade on market open or just ignoring it and waiting for the next signal. I assume that by setting the "end paper trading by date" to 30th one can avoid that, but is that the best way of handling such a situation with a neural system? For something such as trading the DJIA that could be acceptable as one would expect a signal fairly often but for other symbols one could be waiting on a signal for some time.

### **Re: Trading Systems for the COMP and DJIAA.**

Date :8/1/2003 9:40:21 AM Poster : Steve Ward

The closeout trade is new with release 4.0 since that is the first release where we actually show the trading signals during the training period. It is not a real exit signal, we just close out the trade so that trading can start fresh with the new data coming in after training. So really, you could do either of the two things you mentioned. I would tend towards waiting for the next signal, however, because if you started trading on an old one, you might miss a big move before you get in.

### **Re: Trading Systems for the COMP and DJIAA.**

Date :8/7/2003 3:21:30 PM Poster : Maciej

Bob - how have you been getting on with your modelling of the DJ - I'm interested to know because its an index with which I had very little success.

**Recur 4 inputs.**

Date :7/22/2003 2:32:34 PM Poster : Jerry Clark  
To Steve Ward,

This is a question about your reply to Bob on July 21 in relation to the Recur 4 indicator inputs. I have the NI and TP addons and was wondering if you could tell me how to build the following. !. Peak probability (% change)-Valley probability (% change) That's the # 1 input to the Recur 4 that you suggested. If you could explain how that is built, the remainder of the inputs should follow. Thanks, Jerry

**Re: Recur 4 inputs.**

Date :7/22/2003 3:12:54 PM Poster : Steve Ward

Use the Indicator Wizard and insert the indicator Subtract from the Arithmetic category. Set Operand1 to Peakprob and set Operand2 to ValleyProb, both of which you will find in the Turning Points Category.

**Re: Recur 4 inputs.**

Date :7/23/2003 5:04:23 PM Poster : Maciej  
Jerry,

For the DJIA I force an exit to ensure that I'm out of all trades by market close and on some models I will allow only one trade per day (an indicator is available called onetrade on this web site). Once you get your model working you may want to control the period of the day in which you wish to trade, the index is known for having a big surge at open and a dull period around lunch time. Some of us like to avoid those difficult periods.

**Re: Recur 4 inputs.**

Date :8/8/2003 12:16:14 PM Poster : Bertrand

I guess you simply build a cumulative probability indicator by using the Subtract in the indicator wizard.

Best Long signals should come when peak prob. is high in relation to valley prob. This is what Steve is trying to achieve in my opinion.

All the best, Bertrand

**Re: Recur 4 inputs.**

Date :8/13/2003 3:18:43 AM Poster : Bertrand

Sorry, but what I have written is not true.

It was meant to be like this: Best Long signals should occur when valley prob is high in relation peak prob. The reverse is the case for shorts. By subtracting you combine both measurements into one input for the net.

Hope it is clearer now...

Bertrand

### **Are nets only good at entries?**

Date :8/19/2003 2:22:39 PM Poster : Dave Hubbard

This is mostly a philosophical question. It seems that the nets I have been able to develop so far are very good at picking points to enter the market but are terrible at exiting the market when they are wrong. I am wondering if this is a similar experience for others. I am also wondering what others have done to alleviate this. I know there are those from the purist camp which say to just trade the net signals on several different stocks. This will reduce your risk by way of diversification. This is a very good idea. There is also another way to approach this problem and that is to look at it like a system trader and apply a trade management strategy around the net entry signal. I would just like to hear some opinions, ideas, or experiences in regards to this.

### **Re: Are nets only good at entries?**

Date :9/7/2003 2:31:17 AM Poster : Alan RHodes I am very surprised to read your post. I am still waiting for the delivery of the software, but one of the things that attracted me to NeuroShell is that it had built-in exit rules that could be used in the models. I have played around with a very crude genetic algorithm. What I am seeing is that it merely needs supplemental exits due to getting burnt on huge one day moves. This program maybe has 0.1% of the capability of NeuroShell. Post me if you still feel this way about the software, and maybe that is one of the things I can work on after about a month when I know maybe 5% of what this software can do.

### **Re: Are nets only good at entries?**

Date :9/8/2003 3:25:00 PM Poster : Maciej I sometimes use neural networks for the exits as well as the entries but there seem to be two issues with doing that: a) the back testing gets a lot longer. b) the "exit network" is generally a near copy of the entry network where one relies on a negative value to exit. I haven't figured out how to encapsulate the exit indicators (ie trailing stops etc) into a network. If anyone has I'd be keen to know how its done.

### **Re: Are nets only good at entries?**

Date :9/9/2003 6:34:45 AM Poster : Ward.net Webmaster We have just put up a new tip on this site that may help you use trailing stops with your nets. It is called "Putting nets into Trading Strategies".

### **Re: Are nets only good at entries?**

Date :9/9/2003 12:42:49 PM Poster : Maciej

The tip is sound advice but that is not what I'm trying to get to. My point is that it would be useful to know if anyone has used neural nets with indicators inside the nets such as "Open position profit/loss" as well as other indicators such as momentum to get the neural network to make a judgement if conditions favour hanging in a trade or getting out. I can enter with a net but can I get the net to ascertain the most opportune moment to get out based on my current situation? To give an example should I get out on close of day or are conditions favourable to hold overnight because my current loss/gain does not warrant getting out. If I use only normal indicators and no trading system/position information

then any net used for exits is in effect working like an entry net and that's not what is really needed.



### **Principal componants analysis**

Date :9/11/2003 8:34:48 PM Poster : Sam Wheat Steve or anyone who has mastered the art, please post an example and brief commentary on how to use the PCA indicators. Thanks, Sam

### **Re: Principal componants analysis**

Date :9/12/2003 9:48:35 AM Poster : Bertrand Wibbing  
Hi Sam,

one use that would come to mind is to use PCA inside the Trader to build better inputs with higher significance (better content so to speak). In my opinion it can be used as a great tool to decorrelate any type of indicator data. When applying PCA it will give you a sort of ranking the most important features of the data. The first vector has the highest variance to speak more technically. You could then decide to remove the vectors with lower variance to reduce the final number of inputs to your neural net & thus make it more predictable & finally more stable when useen data comes along... :-))

Sorry to make this short, but I am far behind work... :-)

Bertrand

### **Inputs for PCA indicators**

Date :9/23/2003 12:59:59 PM Poster : Bertrand Wibbing Hi,  
one interesting thing I came across today:

It is very important for sucessful modelling with the PCA indicators in the NeuroShell Day(Trader) Prof. to normalize inputs with respect to mean & variance. For a optimum they should have a zero mean & unit variance. Not normalizing inputs could destroy some aspects of PCA analysis.

Good trading to all, Bertrand

### **"Best" objective function**

Date :9/27/2003 1:27:50 PM Poster : John Gotwals Does anyone have any comments about choice of optimization objective while optimizing a neural net? To the casual observer, Maximize Return on Account would seem the best choice. But, NeuroShell lists Maximize #Winners - #Losers as the "most recommended objective." Might the choice depend upon the bar frequency, i.e., 5-minute bars versus daily bars?

### **Re: "Best" objective function**

Date :9/28/2003 4:53:23 AM Poster : Bertrand Wibbing John,

seems like there is no golden rule for this...mostly depends on what your neural net is trying to achieve - better should achieve. I have also found the max return on account to be the most universal objective function the Trader offers, but you might simply try them all for your needs. Also it seems reasonable to me to combine at least three nets with different objective functions, once you have found your best inputs with the GA, try to build a metanet with these inputs, but different objectives.

Would be nice if one could "design" a customizable objec. function inside the Trader, so the Trader gets finally a ratio/index which to maximize for best performance.

Best Bertrand

### **Re: "Best" objective function**

Date :9/29/2003 4:37:27 PM Poster : Maciej I have found in my futures trading the winners-losers\* profit tends to give useful results though you have to be careful as even a negative value can be positive. The other useful one for me has been the Sharpe one. Overall they seem to be too simple if used on their own, ie one objective will never be sufficient, as an example the maximixe return on account could give you just one trade over the whole period which may not be what you're looking for. If one could combine the objectives then that would be a great improvement.

### **Re: "Best" objective function**

Date :9/30/2003 1:45:03 AM Poster : Bertrand Wibbing Hi Maciej & thanks for your answer! Yes, building custom objectives inside the Trader would certainly be highly desirable. In my opinion the GA/TP2 do work indeed great, but sometimes you just don't know how to "communicate" your ideas more effectively with the Trader :-). One more thing on my big wishlist :-). are some restrictions for the GA - I should define my learning target in points/percent & time spent in the market, so that the Trader always catches the right price/time vector... :-). But nonetheless the Trader does what its supposed to & to experiment with it is fun & a very profitable thing to do... Good trades, Bertrand

### **Re: "Best" objective function**

Date :9/30/2003 4:35:13 PM Poster : Maciej Hello Bertrand, Its good to see that you enjoy NSDT as I obviously do.

I've found that the GA optimizes best when I tend to be fairly restrictive in my parameters. I'll even go as far as to say that optimal solution is rarely found by throwing everything at the optimizer and expecting it to triumph. Instead my

experience is that by keeping the ranges reasonable and using fewer indicators I tend to get better results. Would that be your experience as well?

**Re: "Best" objective function**

Date :10/1/2003 5:29:26 AM Poster : Bertrand Wibbing Hi again, yes I do enjoy working with NSDTP much.

After having been tempted (guess everyone starts at this point) to let the GA do my work (with reasonable restrictions it can work sometimes), I took the way back & limit myself to 10 good inputs with some GA work (+-10% parameters) & very few hiddens (rarely over 5-10). Even some advanced regressions do work very well in realtime & I do not overcheck the optimized model before committing myself to it. But the main point is: seek predictive, normalized & very smooth inputs. This will make generalization much more robust. Too much random (noise) features & the model is worthless...just my experience. PCA can enable you to use more inputs with less chance of overfitting. Best of both worlds, so to speak. :-)

Best Bertrand

**Re: "Best" objective function**

Date :10/2/2003 9:08:22 AM Poster : Maxwell Craven I agree with everything you said, except that I haven't tried PCA yet - sounds like a pretty good idea. I use the NI plugin as well with very good results. I use 5 minute bars and with rarely over 2 or 3 months of training data.

**Re: "Best" objective function**

Date :10/2/2003 10:47:18 AM Poster : Bertrand Wibbing Hey Maxwell, thanks for your interesting comments. PCA is very nice stuff, especially in connection with various wavelets & filter banks. :-) Great that you have got good results even on five minute bars, I often use 60mins. Less noise, but also 700-800 bars learning. How often do you retrain? My big net runs every morning while I am at breakfast & smaller ones every hour with ATP2. I hope you could give me some comments on how you work with NIs, regretfully I have not found the time yet to dive into these... Best Bertrand

**Re: "Best" objective function**

Date :10/2/2003 4:14:45 PM Poster : Maciej

For myself working with NI is probably easier than with the other nets in so far as the objective is sort of predefined so you don't have to worry about that. Apparently there is a bigger danger of overfitting with these nets but nevertheless I get good results on 5/10 min bars retraining every 2 weeks in most cases. My results have been better with NI than with the other nets . A useful item is the Jurik JMA indicator which does a useful job in smoothing (normalising?) data.

**Re: "Best" objective function**

Date :10/3/2003 9:36:49 AM Poster : Maxwell Craven I previously retrained my NI (which really means reoptimizing) about every week. However, I noticed that since mid

August the signals I've been getting have been so good I decided "If it ain't broke don't fix it" as they say. So I haven't retrained since then, and my trading equity has been climbing nicely. I asked Steve Ward why he thought that suddenly my NI didn't need retraining any longer, and his feeling was that the last training period I used from about mid June to mid August was perfect in terms of there being no clear trend in the market, so the training set contained a diversity of both bull and bear patterns. I really recommend you take your dive into NI because I've had very good results from them. I tend to use the recurrent ones.

**Re: "Best" objective function**

Date :10/5/2003 8:45:57 AM Poster : Maxwell Craven

I've never used the PCA indicators. All I know about them is that you are supposed to be able to condense information into less inputs. Can you explain how you use them?

**Re: "Best" objective function**

Date :10/8/2003 3:04:48 PM Poster : Bertrand Wibbing

Hi again Maxwell,

here is some background info I recently found on the net:

"PCA is a geometrical ordination method which is used to compress a set of variables into a smaller number of derived variables or components. It is used to pick out patterns in the relationships between the variables in such a way that most of the original information can be represented by a reduced number of new variables. A useful metaphor is think about a photograph. This is a 2-dimensional representation of a 3-dimensional object. As long as an appropriate camera angle is chosen little information about the subject will be lost. Thus, the original 3 dimensions can be compressed into 2 dimensions with little information loss.

As with all statistical techniques there are assumptions about the data. The main one is that the derived components are normally distributed and uncorrelated (orthogonal). If PCA is being used to test statistical hypotheses the assumptions should be valid. The assumptions are less important when PCA is used as a descriptive and exploratory tool. In practice, if the principal components are normally distributed the assumptions may be considered valid."

Interpreting the above statement for use with the Trader you can use the PCA indicators to "compress" your data/indicators, feed them different inputs & use the vectors with the highest variance (most information content to model with) as inputs to your net. It does need some experimentation as all modelling issues in the Trader. If you are serious about modelling with these tools, make sure you normalize the inputs before the modelling stage. This refers to the last statement in the citation above. Use Z-Score to achieve zero mean & unit variance.

Best & good modelling,

Bertrand

### **Neural indicators and bar frequency**

Date :10/21/2003 6:03:46 PM Poster : John Gotwals Can anyone offer any rough generalizations about neural indicators and optimum bar frequency. A week or two ago on this forum, someone mentioned, in passing, that he was using 60-minute bars to reduce the amount of noise. I am wondering if the trading volume affects the usable bar frequency, i.e., if you are trading a high volume stock like IBM would there be less "noise" at a given bar frequency than for the case of a lightly traded stock? Similarly, would exchange traded funds such as Spiders and Diamonds have less noise, at a given bar frequency, because of their composite makeup and (in many cases) heavier trading volume?

Any comments would be greatly appreciated.

### **Re: Neural indicators and bar frequency**

Date :10/22/2003 4:16:35 PM Poster : Maciej

Whatever the frequency bar you may wish to try to normalize the data in order to minimize the effect of noise. One such technique that I use is the average of high/low and close (there are other popular variants) or else I use something such as JMA to try to filter out any noise. The JMA method is quite useful. As for which instruments to use then avoid non-liquid ones unless you like surprises. The ones you mention should be quite reasonable for NI use. I use 10min for some liquid commodities and for the DJ (diamonds) 05min bars but then I'm looking for short term action. If you like being glued to a screen that sort of frequency is fine.

### **Re: Neural indicators and bar frequency**

Date :10/30/2003 10:16:42 PM Poster : Greg Kramer Re: neural indicators and optimum bar frequency

I don't think that your issue is related to neural indicators, but rather to the nature of price fluctuation. Increased volume in a stock generally means that the volatility has also increased. For example, the opening timeframe typically has the highest volume of the day and is also one of the most volatile periods of the day. Later in day when volume dries up prices barely move.

Many of the systems that I have developed perform better at longer time resolutions (e.g., 15-30 min) when compared to shorter resolutions (e.g., 1-5 min). For me this is a fact of life. You look at the realtime fluctuations of a tick chart compared to a 30 min chart you will see that the relative changes are far greater on the tick chart than the longer time frame chart over the same timeframe. If one uses the standard deviation of price data to measure the "noise" or volatility, then you will find that it increases at approximately the square root of the time resolution (i.e., 30-min data it is about  $\sqrt{30}$  times larger than what it is at 1min). I think this has something to do with it (i.e., volatility is only  $\sqrt{30}$  times larger not 30 times larger).

For myself I find that profitable short timeframe strategies (1-5 min) can only be achieved by thinking out of the box. Try using counter-intuitive strategies; take partial profits quickly; look at using limit orders to eliminate slippage, etc.

### **Trading not as good as training results**

Date :10/28/2003 2:05:39 PM Poster : Matt Jarvis

I have developed a neuronal net that I have been trading now for about 2 months. During those 2 months my return on the dollar has been only about 8.5% after commissions (about 51% on an annualized basis), but I got much better returns when I trained this net, more like 120%. Can anyone give me some tips on what I might be able to do to get the returns more like what they were during the training portion? Why doesn't it stay at the same level?

### **Re: Trading not as good as training results**

Date :10/29/2003 6:23:30 AM Poster : Bertrand Hi Matt,

here are some things that come to mind, but I guess what you have just written is in a way normal for trading with NNs. These are issues you have to deal with...

1. Try to reduce & also smooth your inputs (5-10 max.). This may reduce noise in the system, which is most often good for better generalizing of the net.
2. Try reducing the number of hidden neurons of the network model, extensive use of hidden nodes combined with a high noise level will certainly lead to less tradable results. I'll always try to keep as much hidden nodes as inputs in my net. Sometimes (in some indicator predictions for example) even a linear model or a net with just one hidden node will deliver the best overall results.
3. Try to change your target function & also your objective function. Do the target & trading functions reflect your trading style for the net? Hope that all goes well & maybe you'd like to post your progress & findings! Best

Bertrand

### **Re: Trading not as good as training results**

Date :10/30/2003 9:42:34 PM Poster : Greg Kramer

1. Be sure that when you train you are using the same commission and slippage that you actually experience in real trading. Slippage can drastically reduce your actual profits.
2. Two months of actual trading is a very short time; what you are experiencing may just be sample variation. I like to train with years of data covering various types of market conditions. If you look at the monthly returns of systems over a period of years you will notice that they are in general not constant month to month.
3. Finally, analyze how your system traded over the same two months compared to your trading results. If your system is getting same returns as you achieved in real trading, then it has failed an out-of-sample test and you have to go back to the drawing board.

### **Re: Trading not as good as training results**

Date :11/9/2003 5:00:54 AM Poster : Darek Hi there, I don't know what type of trader you are (day trader, position trader etc.) and what type of data have been used (I mean daily, intraday data). However, in my opinion your trading strategy (system) is quite good if your return on the dollar has been 51% on an annualized basis (after commissions) in real trading.



### **Steve Ward's Trading Method**

Date :10/30/2003 2:01:16 PM Poster : John Gotwals I would like to thank Steve Ward for posting information about his trading methodology in the Tips and Techniques section. I found his presentation very interesting and it has given me several new ideas which I plan to investigate for my own use.

If I read his posting correctly, it looks like Steve makes one round trade a day beginning shortly after 10 AM and ending at 11 AM. I can understand the use of the 10 AM entry to avoid the opening gap effects, but why the exit at 11 AM?

### **Re: Steve Ward's Trading Method**

Date :10/31/2003 10:31:31 AM Poster : Steve Ward

You are welcome. I do usually trade only once per day because of the demands of this job (even though our company policy allows personal trading during work hours if NeuroShell is utilized!). Also I believe you can get more accurate models if the nets are allowed to concentrate only what to do at a specific time. However, those times were only examples. I use and have built models for many time periods. I have also in the past allowed the optimizer to tell me what time is best.

### **Re: Steve Ward's Trading Method**

Date :11/2/2003 1:14:50 PM Poster : John Hegarty A key issue for me is how to move from essentially random trial and error models, based on reuse of examples and tips, plus emotional stock selections to some structured and systematic approach to both model development and trading instrument selection. My experience tends to one of frustration - model optimises with normally good historic results but mediocre paper trading, generating 'so what shall I try next'. Ideally I would like to learn move from one model to the next based on something more than just random substitution. Clearly my stock selection could be optimised around some rule based screening - this in itself might make an interesting add-on product opportunity. So my question (finally) is how do people structure their use of NST to systematically build profitable trading models?

### **Re: Steve Ward's Trading Method**

Date :11/5/2003 7:51:04 AM Poster : Greg Kramer Re: "So my question (finally) is how do people structure their use of NST to systematically build profitable trading models?" Here's my process that I previously posted at another site. I develop my strategies in both NST and TradeStation, so what follows applies to both:

My strategy development process is best described as evolutionary (i.e., each major version incrementally improves upon the previous version). I use many tools (e.g., Excel, MathCad, NST, Genetic Algorithms, TradeStation, analysis programs, compilers, etc) In the development of a strategy. Additionally, I have developed standardized data sets that represent different types of market conditions (e.g., bullish, bearish, choppy, etc.) I have different data sets for development (optimization) and validation (out-of-sample).

This requires that I maintain configuration control over these data and analysis results. I do this by labeling each major strategy with a code name (e.g., Downhill) that I use as the title for its "master" folder, that is kept in a separate directory. Each major version adds an extension to the code name (e.g., DownhillSkier) and a subfolder of the same



name to the strategy's folder. All charts, functions, indicators and signals specific to a project/version start with the code name and are kept in the NST and/or TradeStation directory.

For myself the "Best Practices" for strategy development consists of the following phases.

1. Requirements Definition
2. Analysis
3. Design
4. Coding
5. Test and Validation For me these are iterative, I make several passes through them for a given strategy.

**REQUIREMENTS DEFINITION.** This is a key step. Some of these are obvious, but it is important to document them. Some of the things to be defined include:

Strategy Context: What market is to be traded? Is only one security (e.g., QQQ) or several to be traded? Is the system for intraday or EOD? Specific Timeframes: First hour only, last two hours only, first/last three days of month, etc. Will positions be held overnight? What is the Time in Market (always in or percent of time in)? How frequently shall it trade? Will the system be used for mechanical trading or as a decision aid for discretionary trading? If mechanical, will orders be entered manually or automatically? Will the system include Money Management, position sizing, etc?

Define Acceptance Requirements: Equity Curve shape (linear, from Lower Left to Upper Right). (For NST I copy the trades to the clipboard and then paste them into Excel to create an equity curve chart and for additional analysis). Maximum allowable drawdown (%). ROA (%) Percent Win Ave Profit/Trade Etc.

Define Test Conditions: In-Sample and Out-of-Sample Data Sets Commission rate Slippage Trading Size

**ANALYSIS.** Outside of test and validation, this the most critical step. For me this is where most of the work is. This step defines what type of system you are going to develop (Breakout, Trend Following, Reversal/Retracement at support/resistance, hybrid, etc). It is here that one defines the setup, entry, exit, and stop conditions of the strategy. The end of result of this stage is a detailed functional description of the strategy. Admittedly, a lot of this effort resembles a random walk. I've found it crucial to keep good notes of what works and doesn't and in what timeframes and market conditions.

Review Existing Strategies. Review strategies in books, journals, and on the net. Walk through the code to understand the strategies. Test with you test conditions and data set. Document the results. Chart Reading. In this step one reviews the chart of the Data Set at various time resolution, with and without canned indicators (e.g., CCI, Keltner Channels, Stochastics, etc). Step through the data looking for patterns. Are there obvious entry/exit conditions? Don't kiss this effort off. I have found it instructive to step though years of 5-min data by right clicking the arrow key, exposing one bar at a time. Try different indicator parameters. Document your observations. I have found that capturing screen shots and pasting them in to a word document with my annotations is useful.

Data Mining. In this step one attempts to identify relationships that can be used to

develop setup, trading rules and strategies. One attempts to find relationships and patterns between bar data (O, H, L, C, V) at different time resolutions with other data streams, and with processed (e.g., indicator) data. This analysis uses TradeStation processed data as well as other analysis tools such as Excel, MathCad, statistical, Genetic Algorithms (including GeneHunter and home grown), clustering analysis, and other exotic analysis software. See Chap 8 of Pruitt & Hill (Building Winning Trading Systems) and Chap 5 of Stridsman I (Trading Systems that Work) for some techniques and ideas. Draw conclusion as to what works and document it.

Prototypes. Development of a prototype of a strategy component with an attached instrumentation package is a productive effort. This is a good way to test ideas developed above. Trade-Offs. Use the prototype and analysis tools to trade-off various strategy options (i.e., use of stops, profit targets, etc. Functional Specification. Formally document exactly what the strategy is to do with all the parameters and logic that is to be used. Identify what parameters may be optimized, these are the inputs to the strategy.

DESIGN. In the design phase one defines what functions, indicators and signals are to be used or developed. This is an iterative process. Functional Decomposition. Identify specific functional areas within the strategy. E.g., Initialization, OpeningSignal, BreakoutSignal, ReversalSignal, EntryMgmt, ExitMgmt, SizeMgmt, Instrumentation, etc. Use Analysis. Determine which functional areas depend upon each other. Draw a hierarchical chart showing the dependencies and data flowing between them Reuse Analysis. Identify if a specific functional area can be satisfied by using existing functions. Also determine if any of your original functional area are candidates for reuse in other indicators or strategies. Identify Functional Modules. Identify which functional area will be implemented as functions or DLLs. Function Variables. Identify inputs, constants, internal variables, global variables and arrays. Trace Requirements. Trace each Functional Requirement into one or more functional modules. Pseudo Code. Write pseudo code (in EasyLanguage, if using TradeStation) for each function, indicator and signal to be developed. Identify all inputs and outputs and outline logic flow using comments. Paste functional requirements in as comments. One can cut and paste code from your prototypes or other existing strategies as necessary.

CODING. Complete the code based upon the Pseudo Code and verify. Apply your coding standards. Each function shall be independently tested and debugged.

TEST AND VALIDATION. Test. Test the completed strategy with the specified in-sample Data Set. Optimize Parameters. (If required). Step through optimization results and compare with the Acceptance Criteria established in the Requirements Definition. Document which parameter sets are acceptable. Capture Screen shots of the Equity Curve and Performance Summary and save in documentation. Identify one or

more Best-of-Breed candidates for validation. Validate. Validate strategy with out-of-sample data set. Compare results with the Acceptance Criteria. Capture Screen shots of the Equity Curve and Performance Summary and save in documentation. Down select to Best-of-Breed. Post-mortem. Identify where the equity curve needs improvement, and from that the specific trades. Use the instrumentation to analyze what your indicators were doing at that

time. Document your observations and go back to the Analysis Phase. Paper Trade. When your strategy has met you acceptance criteria, paper trade it in realtime as a second validation. Final Release. When satisfied, remove instrumentation, rename as required, and verify code. =====

**Re: Steve Ward's Trading Method**

Date :11/3/2003 7:38:23 PM Poster : John Gotwals

You have mentioned that two of your favorite indicators are the spreads of the Turning Points addon PeakProp -ValleyProb PeakProbB - ValleyProbB

When you optimize these sets of indicators, do you link the corresponding parameters in each pair?

**Re: Steve Ward's Trading Method**

Date :11/4/2003 10:45:25 AM Poster : Steve Ward

No, I've never done that. Try it and see if it helps.

### **Position trading**

Date :10/31/2003 9:35:18 AM Poster : strategist It seems that this forum is going to be a "Daytrader forum". Is there anybody still using the end-of-day Trader with good results?

### **Re: Position trading**

Date :11/1/2003 11:10:10 AM Poster : Matt Jarvis

I own the NS Day Trader Professional but I've been using daily frequency, so I assume that's the same as using the end-of-day trader. Just a couple of days ago I posted my results with my net. Do you think they are good results or not?

### **Re: Position trading**

Date :11/2/2003 3:23:03 PM Poster : strategist

Your result are surely good, but I would like to know if you are trading stocks or futures. I have got even better results using futures, but only on paper until now. That's because with futures you calculate performances as % on margin+ drawdown, and you've got to be very sure of the stability of the trading system before pouring money into it, otherwise you are going to be wiped out. I hope someone else will reply too, I am just wondering how many people have been able to reach a good reward/risk ratio without going into intraday trading (because I would have to live my regular job in order to daytrade!).

### **Re: Position trading**

Date :11/6/2003 5:44:12 PM Poster : Maciej

I would guess that Matt's results are stocks - if you take Steve Wards method for the ES as an example you should be able to achive an annual return of 758% in training with 59% win ratio. I seem to have no great trouble in getting good results with optimization - the tricky bit is as you are finding out making sure that that training is relevant in the immediate future: that's tough! I'd suuggest that you try putting in some stops if you haven't done so to see if you can improve matters.

### **Re: Position trading**

Date :11/7/2003 10:43:04 AM Poster : Matt Jarvis

Yes I'm trading stocks. I don't know much about futures and I've only been trading stocks since I purchased NSDTP. I'm pretty much a beginner.

### **Re: Position trading**

Date :11/7/2003 12:11:04 PM Poster : strategist

Thank you Maciej for your suggestion. Matt's results on stocks are definitely good (if they are stable). I generally avoid optimization, according to my experience it usually produces bad out-of-sample results. I look very much at the equity curve, especially at the out of sample part, in order to judge about the tradability of a system. I will try with some stops even if I am rather sceptical about them, I read once an article by Larry Williams on the web that showed that tightening stops produced a worse reward/risk ratio. It' true that the article dealt with a trend-following systems on the Japanese Yen, always in the market, long or short. Maybe a neural network could behave differently, that's why your suggestion is worth

trying.

**Re: Position trading**

Date :11/10/2003 6:08:36 PM Poster : Maciej

NSDT will confirm Larry's ideas. That doesn't mean that you can't make money with tight stops - only less! However seeing some of the drawdowns on futures with looser stops is tough to trade without squirming. Larry was in any case generally discussing trades over several days and tempered these ideas with a) no stops on the day of the entry [I believe on account of the software he was using for testing] and b) he used a so called "bail out" technique which got him out fairly quickly.

**Re: Position trading**

Date :11/11/2003 7:13:47 PM Poster : Maciej

In reply to strategist, I'd suggest that there should be no problem in avoiding the need to day trade but that you have to bear in mind how NSDTP (and it seems a lot of the other software as well) works. Namely stops and such like do not normally react in the entry bar so if you're using daily bars then there are effectively no stops on that day - risky and in my case for futures not acceptable. What I do with my testing is to use say hourly bars but treat my system as if were a system based on daily bars. That way I can minimise this first bar issue. I personally find that such an approach is more realistic. The alternative would be to accept stops on the first bar that I personally could never afford to take.

**Re: Position trading**

Date :11/13/2003 9:36:37 AM Poster : Ward.net Webmaster

That is partially true. That IS true for The trailing stop indicators that rely on the entry price in their calculation. However, this is NOT true for indicators like Min(Low,5) which do not need the entry price. The indicators like Min(Low,5) when used as stops WILL be in effect on the entry bar when a Market Order entry is used.

**Re: Position trading**

Date :12/5/2003 2:39:15 PM Poster : Brad Stern sure... as a CTA, you have to be a position trader or you'll never run serious money. I am in the process of translating tradestation strategies to the "trader". I have many systems with good results. What do you consider good?

**Re: Position trading**

Date :12/8/2003 1:15:42 PM Poster : strategist

May be from a CTA point of view a good performance is anything with a Sharpe ratio better than the market's, that is, anything that performs better than SP500 with equal volatility, or performs as SP500 with less volatility. But from the point of view of a futures trader like me, "good" means a system that can yield at least 100% per year on margin+drawdown, with an acceptable volatility. Most important of all are a smooth equity curve and maximum reliability as time goes by. The last point is not only a matter

of statistics: past performance does not assure future performance.

**Re: Position trading**

Date :12/11/2003 3:15:08 PM Poster : Michael Stigall I still work with NST charts which use end-of-day data for generating entry signals. The exit signals may be either end-of-day or intraday, depending on the underlying equity. I have several friends that bombed out as day traders over the last four years, and I never want to be glued to a day-trading screen.

### **Predictions unstable in real-time**

Date :12/31/2003 6:01:12 PM Poster : Michael Imas I wonder if anybody encountered the following bizarre behavior in applying previously trained predictions to real-time data (sourced from TradeStation via NsTrdExport indicator). I start Tradestation and Neuroshell Trader, then open a previously trained prediction. The prediction chart is updated with the latest data in real time. I was expecting trading signals to be generated on the last bar as soon as it was completed. To my surprise, signals often appeared or disappeared on much older bars (10-40 5 minute bars ago). For example at 1pm I get a signal to reverse from long to short position. I reverse. Then at 1:30pm I notice that the 1pm signal has disappeared from the chart, and the prediction is still in "long" position. I immediately reverse again to be in sync with the prediction. Then at 2pm I notice that a reversal signals has appeared on the chart at 1:15pm. At 1:15pm, however, the signal was not there - it just appeared later. To say the least, such behavior is extremely disconcerting. It looks as if Neuroshell continues to optimize the prediction using the real-time data (I don't explicitly re-train predictions in the middle of a day). It has been suggested to me that Tradestation changes data on the past bars (e.g. it could change "Close" for 1:05 pm bar at 2:05 pm). While this actually does occurs in rare cases, this was not the case today (I started saving data in files at various times through the day, then compared the data sets; historical bars did not change). So this does not explain the above. Also, the instability is rather extreme, the prediction changes its recent historical trades 4-8 times a day and thus is impossible to follow. Small changes in past data should not trigger that. Regarding the prediction, it uses 5-min data streams for SPY and QQQ's, and uses linear regression, lagged linear regression, etc. - nothing fancy. I don't use "Lead" indicator or Peak/Valley indicators, I know those can change after the fact. I predict % Change in Open of SPY. Did anybody experience something similar? Predictions look good in Walk-Forwards, but this instability makes it impossible to trade. Thanks a lot!

### **Re: Predictions unstable in real-time**

Date :1/2/2004 9:30:14 AM Poster : John Gotwals I have been having a somewhat similar problem, but far less severe. I have observed, and reported, a situation where I am using recursive neural nets with turning point indicators and using time flags to force one trade per day. On occasion, perhaps every 2nd or 3rd day, I will observe a buy or sell which had occurred on an early bar, such as the 2nd or 3rd bar, to suddenly reverse later in the day. To catch these situations during paper trading, I always write down the initial order so that I can rule out the case of failing memory on my part. This problem has occurred when I have been using 5-minute bars.

I have not pressed Ward Systems about this matter, other than the initial report, because the problem is sporadic and probably difficult to duplicate.

### **Re: Predictions unstable in real-time**

Date :1/2/2004 12:53:34 PM Poster : Ward.net Webmaster

Actually, Turning Points is another of those indicators which sometimes DO change with new data, as we have noted in our documentation (although the note was probably added a month or two later than your copy - we'll send you a new help file, which was all that changed in May 2003). We'll have to get Michael Imas' chart to see what is happening there with TradeStation.

### **Re: Predictions unstable in real-time**

Date :1/2/2004 2:03:42 PM Poster : John Gotwals I went back and read the Overview portion of the Help file for the Turning Points indicator, and with chagrin I have to acknowledge that the statement you are referring to is present and indeed is quite explicit about this fact. The Help file states:

"New data can change the location of the most recent turning point. For example, suppose the last turning point is a peak. Then suppose as more data arrives, and a new higher peak is found before a valley is found. In that case, the last turning point will be readjusted higher. If you have built a trading strategy based on any of our indicators in which the location or value of the most recent turning point is involved, it is possible that a signal already on the chart will move or even change."

I thank you for your help on this matter.

### **Re: Predictions unstable in real-time**

Date :1/14/2004 11:18:21 PM Poster : Greg Kramer

I once had a DLL that I had written which did the exact same thing, except that I only used it as a indicator or in a strategy, never in a Prediction. I concluded that some how the DLL was "looking ahead" (i.e., Leading). I sat down and walked through the code until I found the line of code that "looking ahead" of the current bar. For the current bars it was using "noise" somewhere in memory. But after a few bars, the calculation was only using real data; and if it affected the Buy/Sell thresholds, the strategy would change after the fact.

Based upon this, I would conclude that your Prediction is somehow using Leading data. It could be in:

1. Any of the inputs you developed.
2. The built-in indicators that your are using
3. The Predictor code itself
4. Your data source is changing previous bars.

Since, others haven't experience the problem, items 2 and 3 are improbable; unless you are using a infrequently used built-in indicator.



**TURNING POINT ADD ON**

Date :1/12/2004 3:36:47 PM Poster : TURNING POINT ADD ON Does anyone use the TP support and resistance for breakouts? I am looking into this but struggling a little. It seems to make sense.

**Re: TURNING POINT ADD ON**

Date :1/15/2004 8:51:28 AM Poster : chris wong  
it sounds like a very good idea to me. i would think you need imaginary probability channels. if the price breaks above a high probability of a peak without turning, then you have an upward breakout. if it drops below a high probability of a valley without turning, then you are breaking out below. you could use optimizer to decide probabilities but i would guess probabilities would make themselves obvious by inspection.

**Re: TURNING POINT ADD ON**

Date :2/11/2004 6:47:23 PM Poster : Scott Douglass I'm using it. What's up?

**Re: TURNING POINT ADD ON**

Date :2/12/2004 8:49:05 AM Poster : Ward.net Webmaster For what it is worth, there is a new comment about filtering TP as a Feb 2004 update to one of our Real Traders: Retired investment advisor trades full-time with the Trader. We doubt it has anything to do with breakouts, however.

**Re: TURNING POINT ADD ON**

Date :2/12/2004 5:21:42 PM Poster : Maciej  
Trying using a logic of going long when crossing above support and getting out when the PeakProbability Bars is close to 1. Reverse this process (using resistance and ValleyProbability Bars) for going short. Should give you interesting results. It amounts to a channel approach but it seems mathematically superior. I further smooth the price to reduce the trades.

**Generalize on optimal walk forwards**

Date :2/4/2004 4:14:56 PM Poster : MFK

In the Tips and Techniques titled "using generalize on optimal walk forwards," you make the suggestion to "select no walk forwards, but select optimal walk forwards instead." Do you have any recommendations concerning the number of optimal walk forwards to use and the number of periods those walk forwards should include? If we're trying to find the walk forward "that worked best later on," is it better to have a larger sample to select from?

**Re: Generalize on optimal walk forwards**

Date :2/5/2004 6:31:07 AM Poster : Maciej I use 6 of 1 month and this tends to give me good results in futures. To be fair I've arrived at that figure more by luck than real judgement. My feeling is that you are right in believing that a larger sample is better ie 6 of 1 month should be better than 2 of three months..

**Re: Generalize on optimal walk forwards**

Date :2/5/2004 9:04:04 AM Poster : Steve Ward I'm not sure I should call this is a recommendation, but I only use one walk forward in my personal trading, and I set the length to something I think is appropriate, like 3-6 months for daily bars, 1 to 3 weeks for 5 minute bars.

**Re: Generalize on optimal walk forwards**

Date :2/5/2004 1:49:40 PM Poster : Maciej

My approach has been based on the expected duration of a trade. I expect my trades to last a maximum of 5 days so if I use one month and am aiming for a 60-70% hit rate I should be able to get 2-3 succesful trades in a period of 1 month.

### **about R-Square**

Date :2/19/2004 11:28:41 AM Poster : Li Chuan-Lien

hello:

Any body know ? I use the NeuroShell Trader Professional to prediction Taiwan's Stock. But why my training data that show's R-Square is very low? My R-Square is about 0.00XXX. What about your's R-Square?

### **Re: about R-Square**

Date :2/19/2004 4:48:29 PM Poster : Bertrand Wibbing Hi Li, what do you try to predict? In other words: what is your desired output & how many bars ahead?

Generally I do not put too much weight on statistical measurements, but judge outcomes of the Trader in terms of practical "tradability", if it has merit, I'll go for it...

Best to you & your trading, Bertrand

### **Re: about R-Square**

Date :2/20/2004 10:14:25 AM Poster : Maxwell Craven I have to agree with Bertrand 100%! On 2/19/2004 4:48:29 PM Bertrand Wibbing wrote:

Hi Li, what do you try to predict? In other words: what is your desired output & how many bars ahead? Generally I do not put too much weight on statistical measurements, but judge outcomes of the Trader in terms of practical "tradability", if it has merit, I'll go for it... Best to you & your trading, Bertrand

### **Re: about R-Square**

Date :2/23/2004 8:32:57 AM Poster : Energy Thank Mr.Bertrand and Maxwell I want to predict the taiwan's stock. (taiwan's listed securities) Because I want to analysis the taiwan's stock use the NST that maybe can give some good trades for me. My output is "Optimal Percent Change in Open", "3 trading days into the future from the next open". And hello Bertrand: You write that "how many bars ahead". I don't know what your mean. Can you explain again for me, please?! thanks a lot by lien

### **Re: about R-Square**

Date :2/27/2004 4:55:11 AM Poster : Bertrand Wibbing Hi Enery :-)) Mr. is absolutly not necessary :-) So, here are some tips that came to mind while reading your post:

1. First smooth the Open, then try to predict it, percent change is a good start, maybe you also like some indicator, oscillator -> try also predicting it a half cycle ahead.
2. Do you only want to trade your portfolio of stocks on that prediction? Add some more confirming indicators & let the nets be one tool of your box, I know many people search for the holy grail buy/sell out there, but I am happy being now of that way...I think you can use the Trader much better for pattern classification. Just my opinion, because this approach may be much more stable & relaxt from a practical trading perspective.
3. With bars ahead, I simply meant the prediction horizon you enter in the prediction wizard or directly in the addons...
4. To get a much better feel for what your nets & predictions are "realtime worth" chart the net directly over the desired output (in your example: optimal percent change in open), not shifted ahead x bars. A % percent error or some R Squared are valid measurements, but as they are somewhat dependent on the correct probability

distribution to make clearcut statements I would not put too much weight on them.

All my best & if questions pop up, let us know...this forum has gotten a bit "sleepy" for my taste :-)) Bertrand

**Re: about R-Square**

Date :3/1/2004 11:13:08 AM Poster : Tree

Hi, Energy:

I am from Taiwan. It's an honor for me to meet you. I want to make a suggestion. When you have time. We can discuss something about NST. Thanks.

Tree

**Steve Wards Trading Method**

Date :3/11/2004 4:29:35 AM Poster : Robert J Van Eyden Hi, After many years, I'm trying to get back in swing of things and I appreciate articles such as Steve's on his trading method. I do have one question, which is probably as vital as the inputs in designing a net, what is the output he is trying to predict? All I could gather from the article is that he is trying to predict the overnight gap of the S&P e-minis, do I understand correctly that he is predicting the change of the previous days close and today's open or have I totally lost the plot. Any insights will be appreciated.

Regards Robert

**Re: Steve Wards Trading Method**

Date :3/11/2004 10:29:22 AM Poster : Steve Ward I suppose I should clarify that in some detail. The Neural Indicators are not trained in the usual way neural nets are trained. That is, they don't have actual outputs to learn from. They aren't taught to predict the percent change in price, or any future value of any kind. Since the internal weights of these nets, embedded as they are in indicators, are modified by the genetic algorithm optimizer, they can simply be taught to produce signals that make money without training on some actual output. (That's one reason I like them so much, and as far as I know, we were the first to ever use this technique). So they aren't trained with any output, but they do produce an output -a signal from -1 to 1. The higher the signal the higher the probability that you should buy (if the indicator is used as a buy condition) or sell (if used as a sell condition). When I said in that tip that I sometimes predict the overnight gap, I was referring to how I set up the entry and exit times. To predict the overnight gap, you make sure entry occurs around 4PM EST, and exit occurs first thing the next morning. You do this by putting time flags in as entry and conditions as follows: Buy long when all of the following are true: The long entry neural indicator is > x The time is = 3:55 PM Sell long when all of the following are true: Time = 9:35 am Sell short when all of the following are true: The short entry neural indicator is > x The time is = 3:55 PM Cover short when all of the following are true: Time = 9:35 am What the strategy above does is make a decision every day at 3:55 whether to go long, or short, or do nothing. Using the times in this manner allows the neural net to narrow the amount it has to learn. It only has to learn to make decisions about one time of the day, not all day long. Instead of predicting the overnight gap, you could just as easily make a model to predict between 10 and 10:30, or between 12 and 1, etc. You can have several models that specialize on different parts of the day. No, it is not a mistake above that both long and short entries use

A>B. Neural indicators are very symmetric, and they will train to produce appropriate signals whether you use A>B or A<B in long or short conditions. So once I insert A>B as a long condition, I can insert the same rule again as a short condition or as exit conditions without having to retype it all in again. I think Neural Indicators combined with specific time frames are such an advance in trading that it is worth it to me that everybody understand them. So I invite more questions on this thread on the subject.

#### **Re: Steve Wards Trading Method**

Date :3/12/2004 8:37:38 AM Poster : John Gotwals I notice that you are not using the conditional versions of the neural networks. Since the conditional versions are easier to add (one less if statement), and they do not add another degree of freedom to the model, why would they not always be used?

#### **Re: Steve Wards Trading Method**

Date :3/13/2004 7:02:02 AM Poster : Steve Ward That's a really good question. Probably just habit, but maybe in the back of my mind I wonder if they might work a little better if that threshold (the B in the hidden A>B) is allowed to vary too, in spite of the extra free variable. Anyway, I have no solid reason why I do not use the conditional versions.

#### **Add-ons**

Date :3/11/2004 10:44:38 AM Poster : Steve Ward  
Since my advanced AI College course does not cover add-ons, and since so many of you who own them do not fully understand their use, I now invite questions about our add-ons on this forum. The following add-ons were either programmed or designed by me because I wanted advanced techniques for my own trading: Adaptive Net Indicators (ANI), Adaptive Turboprop2 (AT2), Neural Indicators (NI), Cluster Indicators (CI), Turning Points (TP), and the Fuzzy Pattern Recognizer (Fuzzy). They are advanced concepts, and so you should not be shy about asking about them. To begin the discussion, I want to point out that many users of addons do not know that each add-on has its own help file, and that all except Advanced Indicator Sets 1 (AIS1) and 2 (AIS2) have examples. The help files describe how to view the examples.

#### **Re: Add-ons**

Date :3/11/2004 4:17:00 PM Poster : Maciej  
Steve, Concerning the TP Addon: Is it possible to create an indicator that says Close > line joining TP 4 and 2? I can get a support / resistance line from the TP Addon for Turning Point no 2 but can I slant it according to the previous support / resistance line?

#### **Re: Add-ons**

Date :3/11/2004 4:51:29 PM Poster : Steve Ward  
Well maybe. First I assume by TP4 you mean the 4th turning point back. There's an old tip called Trendlines that tells how to calculate lines between two price points. You know the x values using the TPBars indicator. You know the Y values using the support and resistance level indicators. See if you can combine all those things to get at least close to what you want. I haven't tried it, but it sounds feasible.

**Re: Add-ons**

Date :3/16/2004 2:29:13 PM Poster : Bill Van Dyke

Hello,

I'd appreciate maybe an example of how the Adaptive Turboprop2 (AT2) can be used as an Indicator inside a Neural Net Prediction. I understand how AT2 can be used in a Trading Strategy and both examples that come with it show this.

But i'm a bit fuzzy as to how to include AT2 as an Input to a Neural Net prediction and how to be sure AT2 is not engaging in any forward leak or something else it shouldn't do, in such a case, for example. Thanks a lot.

Bill

**Re: Add-ons**

Date :3/17/2004 5:31:00 PM Poster : Maciej

Is it a good idea to use a neural net within another net?

**Re: Add-ons**

Date :3/18/2004 8:15:16 AM Poster : Steve Ward

In spite of the fact that we mentioned feeding AT2 indicators into the Prediction Wizard in the help file, it does seem a little like overkill to me. I supposed you could call such use a supervisory net evaluating a panel of other nets.

Nevertheless, the only reason I would ever use AT2 nets in the PW is so that I could have one net for all entries and exits as explained in the tip on this site called "Speeding up the add-ons". AT2 was really built to replace the Prediction Wizard in the sense that nets could be optimized with other indicators in the Trading Strategy Wizard, and so that training parameters and output indicators could be optimized at the same time.

**Re: Add-ons**

Date :3/18/2004 1:43:41 PM Poster : Bill Van Dyke

Steve, Thanks for the input. Feeding AT2 into the Prediction Wizard was mentioned as you say in the Help File and that's why i asked the question; but i tend to agree with you i'ts probably best not to do so. Thanks for the reply.

Bill

**Re: Add-ons**

Date :3/19/2004 6:45:42 AM Poster : Bertrand Wibbing

Hi Bill & Steve,

I think it totally depends on what you try to achieve in the PW...

Oftentimes I find myself using the addons to "polish" my inputs further before feeding them into the final neural net used for trading...though I think it pays off to seriously limit parameter ranges...unless you have a Cray working on it ;-))

Best & nice weekend,

Bertrand

**Re: Add-ons**

Date :3/19/2004 11:10:19 AM Poster : MFK

Steve:

In the tips and techniques article on your trading method, you say you let the NI add-on train from three to six hours. That time, you suggest, is needed to optimize the three to five indicators used, plus the up to 18 weights used in, say, a recurrent 5 NI. That prompts several questions:

1. Is there some rule of thumb you use to estimate how much time the net will require to adequately explore the parameter field? Or is it just one of the "hunches" you have based on your years working with Ward products?
2. If there is some rule of thumb, would it also apply to the other Ward add-ons, such as Adaptive Nets, Adaptive Turboprop 2, etc.?
3. With a three to six-hour training time, how often do you retrain your NI strategies? Not surprisingly, I've found that my NIs are strongly influenced by the patterns they're trained on, to the point that those trained on data from last year are having a difficult time in this year's strong up move. (I'm not getting bad signals; it's more of a matter of missing signals.)
4. Which leads to a final question: What are the chances that NI (and other) add-ons might include a "retrain" function similar to that on Adaptive Turboprop 2?

#### **Re: Add-ons**

Date :3/19/2004 3:26:39 PM Poster : Steve Ward I'll answer your questions by number:

1. The only rules of thumb I have are (a) NI take a long time, and (b) the recurrent types take much longer because they are building a "lookback". Beyond that it just depends on training set size, number of inputs, whether you have 2 NI in buy/sell rules or 4 because you included exits, how predictable your issue is, speed of your computer, and probably more. No science here.
2. If I had less fuzzy rules, they probably would not apply to the others, because NI are the slowest, being trained by the optimizer as they are.
3. I usually retrain/reoptimize once a week on the weekend.
4. The retrain option for NI isn't practical because it is really reoptimizing each time. Nobody would want the NI to start reoptimizing in the middle of a daytrading session! But note that ANI already have an automatic retrain every bar.

#### **Re: Add-ons**

Date :3/18/2004 8:16:13 AM Poster : Steve Ward

You just select one of the AT2 indicators as a Prediction Wizard input exactly the same way you select any other indicator as a Prediction Wizard input. Of course the AT2 indicators have parameters that need to be set, like any other indicator has parameters that need to be set. Since the AT2 indicators are themselves nets, their parameters include THEIR inputs.

#### **add-ons**

Date :3/19/2004 2:37:25 PM Poster : Al Martin

As I own a number of your add-ons I am aware that I am not getting as much out of

them as I could. For me it seems that there is not enough discussion about their use with enough examples to highlight the fine points. I have not seen a good discussion of the various parameters such as "neighborhood", "window" etc. Also, it would be good to discuss the interactions that can occur between add-ons. For example is a good idea to use Lag inputs in Adaptive Turboprop2 and also use recurrent inputs for neural indicators? Have you considered creating an add-on educational CD which could focus on in depth use of specific add-ons? I know I would be willing to pay for that type of help. From reading the notes in the forum, I can tell that Neuroshell users have many different skill levels. I am sure that for the more technically advanced additional explanations may not be necessary. But, I would think that you have a considerable number of users who would be interested in greater detail. I also suspect that greater detail contributes to greater sales.

### **Re: add-ons**

Date :3/19/2004 3:43:30 PM Poster : Steve Ward

Well that's exactly why I started these threads - to promote more discussion and education about the addons. There are so many ways the add-ons could interact and be used I could not possibly think of them and document them all in advance in an educational CD, even if I knew answers to questions such as yours below. But frankly I find most users don't even assimilate the information in the respective help files, which is another reason I'm willing to help here -I know the add-on technologies are complicated.

Your specific questions have to be answered "Try and see." There are no absolutes in using many of the multitude of tools we provide, and often it depends on what you are predicting, what your inputs are, what the market is like recently, etc. The lag versions of ANI and the recurrent NI were built, however, so that history could play a bigger role in each decision. On the other hand, many inputs and indicators already lookback.

### **Add-ons**

Date :3/19/2004 2:46:12 PM Poster : Al martin

In a previous note I meant to identify Adaptive Net Indicators and not Adaptive TurboProp2. I was concerned about the interaction with a great number of recurrent inputs.



### **optimization targets**

Date :5/3/2004 12:36:09 PM Poster : cabruner First, let me say thank you to Steve Ward for posting much detail about his own trading methods to the ward.net website. I find distilled insight to his own experience very useful and I'm guessing many others do too. Regarding optimization targets, I've tried many times to move away from Return on Account to a target which incorporates risk as well return, such as Sharpe Ratio, Ratio Gross Profit / Gross Loss, Max Avg Trade Profit etc.. Unfortunately, I never find them useful because they almost always optimize to something with very few trades. A simple example: If you select Max Avg Trade Profit, one trade worth 10% will always trump 40 trades worth 1% each. Clearly I can't depend on the first scenario to perform well out of sample, but the 2nd is a great result. This happens with the great majority of optimization targets provided, which seems directly contrary to intentions for including these. I think a simple solution to my problem would be the ability to specify a MINIMUM number of trades (or trades per week, month, etc..), so that I can be sure the statistics are generated from a meaningful sample. I think this could go a long way to defending against over-optimisation and building systems which perform robustly out-of-sample. It would also be nice to be able to specify a maximum number of trades, but I agree it can be done approximately by raising transaction costs. Unfortunately, I don't know of a way to jog Trader into raising the number of trades it selects for.. Any thoughts/advice much appreciated, cabruner

### **Re: optimization targets**

Date :5/3/2004 4:46:48 PM Poster : chris wong the average trade span parameters sometimes help me with this. i also sometimes use winners-losers or similar, which gets away from the one big trade beats all scenerio

### **Re: optimization targets**

Date :5/8/2004 12:20:15 PM Poster : Chris Bruner

Hi Chris

Thanks for the suggestions. I've tried those before and agree they can be somewhat useful to help with this problem.

That being said, I think a minimum trades specification would be very useful in addressing the issue, and would unlock the ability to use all the other optimization targets in their intended manner.

Generally, I think improvements to defining optimization targets, as well as filtering criteria for what are acceptable trading results, are the most important areas for improving Neuroshell Trader.

The benefits are many:

- 1 - Greater ease to apply practical market knowlegde to the problem and let the optimizer help you disqualify non-practical solutions.
- 2 - Resultantly, less fear of over-optimization.
- 3 - Scaling to optimize for similar results across securities of different volatilities, which can only be done using risk-adjusted metrics. This is especially important if you trade securities using leverage.

Over-optimization to me is simply not having a well-defined optimization target. If you have a better target, you should always be happy to fully optimize.

Just my two cents. Is there somewhere I can log feature requests more formally? I also wanted to ask if walk-forward testing will be available in Trading Strategies at some point in the future.

Best regards

Chris

**Re: optimization targets**

Date :5/11/2004 8:19:17 AM Poster : Ward.net Webmaster

We agree with most of what you said, and all the features you requested are already on our projects list. However, here's one part we don't agree with:

>Over-optimization to me is simply not having a well-defined optimization target. If you have a better target, you should always be happy to fully optimize.

We think you can over optimize any target given enough free variables or too few bars that you are optimizing over. It isn't the better target that's needed - it is more relevant inputs (if using a net) or rules (if using a trading strategy). If you have the right input variables, that is when you are happy to fully optimize.

Unfortunately, even that isn't true when the data has noise, because then you are always in danger of fitting the noise.

Nonetheless, the ability to let users build their own target is something we want to do.

**Re: optimization targets**

Some time ago I suggested that a good way to modify the fitness of optimizations would be to add the ability to penalize trades, as by slippage or commission, in the trading costs parameter dialog, using an "indicator" of your own choosing (right from the builtin or custom indicator wizard). For example, you could cause too few trades per

month to add a penalty, or more trades to add a bonus, and you could shape this constraint at your pleasure. The advantage to this would be that Steve Ward would not have to alter the logic of the built-in fitness criteria.

Anybody else like this approach???

Steve

### **Bizarro!**

Date :6/1/2004 12:23:12 PM Poster : Steve Eberbach I read with considerable enjoyment Steve Ward's recent tip for contrarian trading of neural network models. I contacted Steve and received his blessing for trying to start some dialogue on the forum on the subject. I am very interested in finding out what other people think about this subject, as the phenomenon is well known, but all people seem to do is joke about it. Here is one example of what I found. Rather than reverse the trading strategy, I used a "target", which the neural network tries to fit using a least-square fit, which is inverted, typically an average or momentum of the next few days' prices. I use the genetic algorithm to try to optimize total profit, in contradiction to the effort of the neural network target fitting. (I am oversimplifying a bit here, for the sake of not writing a book in this posting) Next, I did many walk-forwards of this process, and overlaid the equity curves of the span of time out of sample. The look-forward was typically 6 months using end-of-day data. The resulting average shows that there is a "signature" pattern, which I call "the hook", in which equity immediately rises for a characteristic period, then drops. This is the same as saying that if the usual kind of walkforwards are overlaid, the equity will show a tendency to drop immediately out of sample, then later recover. So I know the bizarro phenomenon is real, and pervasive. Of course, automating this is somewhat difficult, so it may seem to be a lot of work for a trick that does not always yield a big payback. But I do find it tradable, and take it seriously. This is the main reason, in fact, why I have posted and begged for some kind of user-defined fitness, or at least a penalty factor, either in the fitness choosing dialog, or in the transaction cost dialog, said factor being an indicator built with the Indicator Wizard. My basis for this is that I consider the whole "Bizarro" thing to be a special case of user modification of the Fitness definition which happens to offer serious profit potential. (minimum profit in training, maximum profit in optimizing just beyond the training period) Beyond this very important, but very limited discovery lies a bigger world of successful trades which I believe is denied to us by the restriction of not being able to define what we are trying to get the Artificial Intelligence to do. So far, all the neural net tries to do is reach the holy grail: a FOREVER upward sloping equity curve, when we all know this is quite difficult. We also all know that known successful models are likely to be traded against, hence the phenomenon of "worn out models". No stock goes up in a straight line, so why should an equity curve? The REAL goal is that the equity curve will be more tradable than the underlying security which generated it. I will make good use of an upward sloping equity curve with a higher probability of going up for a while. Then when it fails, knowing it is likely to go down for a while!!!! Anybody else out there have any experience or ideas about this???? Steve Eberbach

### **Re: Bizarro!**

Date :6/2/2004 3:10:58 PM Poster : chris wong i'm not following your last paragraph, probably because i don't agree with the premise that the objective functions force equity to go up forever. they aren't time related - they measure a summation of some measure of profit, so the equity curve could look like a hill, couldn't it, up one side and down the other? anyway, what objective function would you use if ns allowed definitions, which i do think would be a nice addition.

### **Re: Bizarro!**

Date :6/2/2004 11:12:12 PM Poster : Steve Eberbach OK Chris, here we go: Thanks

for the response!!!

Yes, the equity curve usually DOES look like a hill, if you rise in profit first, after some time, the hill returns, or retraces some or more than all its rise. Often, the equity curve also looks like a valley; it drops immediately out of sample, then later recovers. Other times, it simply goes flat. What is interesting, is that it often shows these shapes, and enough so that they are recognizable by inspection. The more effort you expend modelling a process to produce a long time rising equity curve, by telling the algorithm to maximize long term summation of profit without adaptation of that model to changing conditions (entering from beyond the model's experience space), (and rejecting an up and down shaped equity curve) during the TRAINING and TESTING phases, the quicker the equity retracement out of sample, in most cases. That is what Steve Ward calls "Bizarro!". So the time spans you choose for the training, testing, and out of sample look forward become confusing factors in determining the REAL fitness of your model. One would think that simply keeping the lookahead very short, and updating often, would give the most reliable profit, since intuitively one would think the model is more adaptive this way, but since there is an effect that immediate time span out of sample can have a LOWER slope of equity versus time (than farther out in time), that strategy can be self defeating. My theory is that the effect itself is caused by traders using optimizers! (either computed or human experience)

So I am trying to find a fitness which is dynamic, and takes this phenomenon into account. So far, I have found that IF the desired equity curve IS a hill or a valley, and IF the length is chosen well, the downside can be a more reliable trade than the upside. I also consider the longest-rising equity curve a special case from many possibilities, and the one which most present-day optimizers compete with each other to achieve.

This is contrary to the idea that fitness of a model should only be the final summation of gain over time. To research this further, I would like to see the ability to create dynamic fitness-modification functions, with the indicator wizard, depending on how far along in history "time-zero" is in training, into testing, or into "out of sample", and how well the trading strategy itself is doing at  $t=0$  plus or minus some short duration.

Steve

### **Bizarro - another idea/question**

Date :6/3/2004 11:11:37 PM Poster : Kermit

My idea about bizarro is that it is similar to Soros' reflexivity. I have always called it knowledge of the fundamentals changes the fundamentals. Most of my modeling is using fundamental data, and there is, IMHO, an example of this in the cattle market right now. Fundamentals look great, and the consensus among people who study the fundamentals is that there is nothing on the horizon to break this market. All winter producers have been told that the May/June time should see the biggest numbers and lowest prices. So now we are in the middle of it, and prices have been going straight up (no surprise). So, have enough producers modified their feeding programs to avoid selling finished cattle at this time and will there then be more than expected in the coming weeks? This is why I call this behavior "knowledge of the fundamentals

changing the fundamentals." Is this what the bizarro method is trying to model? Trying to model other models behavior and take the contrary position? I would be very interested to hear if this is successful - I suspect that consistency would be a problem, just from personal experience.

**Re: Bizarro - another idea/question**

Date :6/5/2004 9:22:14 AM Poster : Steve Ward

Yes, I don't see why you couldn't have Bizarro fundamental models. If the fundamentals are right and everyone followed the fundamentals, then everyone would have to get rich, and that can't happen.

**More on bizarro**

Date :6/12/2004 6:23:26 PM Poster : John Gotwals I have been following the bizarro discussion and tended to write it off as a delayed April fool's joke. However, I have been paper trading two models since the beginning of May, and something has arisen which appears to fit the bizarro classification.

One model uses a ClusterC3 indicator and the other uses a Recur3C. Both models have the same inputs and are optimized for the exchange traded funds DIA, QQQ, and SPY. The trading strategy has rules which restrict the number of trades to one trade per day per issue. The open position can occur anytime after the market opens and the positions are all closed at 3:55 PM.

The Cluster model gives moderate results for DIA and SPY and breaks even for QQQ. The Recur model give moderate results for both QQQ and SPY. However, for DIA the Recur model is consistently wrong. Not 100% wrong, but for the five week period the weekly totals are always negative. In fact if the trade opposite to the Recur3C model prediction had been taken for DIA, the six week return would have been twice as high as the best prediction from the nonbizarro cases.

I presume this could be a statistical fluke, but these results are from the last 28 trading days. I will be interested in your comments.

**Re: More on bizarro**

Date :6/14/2004 5:48:32 PM Poster : Maciej I've tried trading in reverse systems that did badly but I've found that just because a system lost a packet on paper does not translate into a winning system just by trading the signals in reverse. I'd be very wary about doing that in practice.

**Re: More on bizarro**

Date :6/14/2004 10:30:20 PM Poster : Michael Imas

One aspect of "bizarro" models is as follows: if "bizarro" models are actually profitable, would it not logically follow that "straight" models based on neural nets and/or genetic algorithms not only unprofitable, but lose money? Would it not also mean that most folks espousing those "straight" algorithms are losing money to "bizarro" modelers? And if the markets have become orthogonal to those methods due to too many folks trading away whatever inefficiencies existed, how long will "bizarro" models hold up? This is not meant as a criticism of any method or approach, just as a question of applicability of AI methods to markets where such methods have become accepted.

**Re: More on bizarro**

Date :6/15/2004 12:03:39 PM Poster : Steve Eberbach

To answer your questions:

. "would it (not) follow..but lose money" A: Straight models often lose money, in my experience. I see it this way: The genetic algorithm picks a point in modelling space where a certain model has done exceptionally well for a long time, due to the definition of fitness. This may have a corollary effect that there is a depleted area of points around this sweet spot which are unusually deficient in longevity, because a market behavior shift in any dimension/direction leads to a dropoff in longevity property. Therefore the best models fail sooner "making up" for their recent artificially sustained success. The cause of this may be due to some traders trading against patterns they noticed from the big program traders (who use optimised models), or it may be just a statistical property.

. "Would it not also mean....losing money to bizarro modelers? A: First I do not think that there are many bizarro modelers. But I think the "straight modellers" are trying so stubbornly to create forever-lasting models that there may be some market inefficiencies (opportunities) created artificially. I would agree they are likely losing money to traders using a different strategy from following one optimized model at a time.

. " how long will bizarro models hold up?" A: Sometimes, longer than straight models! That is why they are interesting.

As to any method or approach, I am looking for other people's experience with this. My early experiments with inverting fitness and overtraining were clearly showing something very interesting, and I think there is more to be found.

**Re: More on bizarro**

Date :6/18/2004 1:09:08 PM Poster : Steve Ward I think you've got yourself a Bizarro model. Recur3 may be fitting more tightly than the other models, or maybe the DJ is just too different. You may or may not have to retrain it frequently so it stays wrong.

### **Applying 'Threshold' filter to a Prediction Signal**

Date :6/25/2004 7:08:08 PM Poster : James Siebert Greetings, I've been trying to build a Trading Strategy based on a Prediction Signal series which slowly oscillates around the zero line. I found that many times the Prediction Signal barely crosses the zero line, and then moves back in the next day or two, generating unnecessary Entry Trades (or or early Exit Trades). My idea to solve this was to create Threshold Indicators, which would require the Signal to "reach a minimum level" before Activating a Trade Signal, for example: "Long Threshold" Indicator:  $\text{Mult2}(1 * 0.18)$  Long Trade Signal: If Prediction Value  $\geq$  "Long Threshold" then 1 else 0 and a similar indicator for "Short Threshold":  $\text{Mult2}(1 * -0.25)$  with is used in Short Trade Signal: If Prediction Value  $\leq$  "Short Threshold" then 1 else 0 This accomplishes my goal of only using "strong" Prediction Signals in the Trading Strategy, and filtering out the weak cross-back signals.  $\Rightarrow$  the Problem is: that to adjust my minimum Threshold Values (say adjust Long Threshold from 0.18 to 0.15) I can not just change it in one place, like the "Long Threshold" Indicator, but instead have to find every place this Indicator was referenced and then individually overwrite each 0.18 Value with my new 0.15 test Value. This become problematic especially if I've used this Value in multiple Predictors and Indicators. Question: Is there any way to define and set a Variable such as this, so that it need only be changed in one place, ie. where it was first defined, and have that change apply automatically in all the places it is referenced, like a normal programming Variable? Thanks in advance for any ideas

### **Re: Applying 'Threshold' filter to a Prediction Signal**

Date :6/27/2004 10:39:13 PM Poster : Steve Eberbach Under "New and Updated Examples" on this web page is tucked away a set of "Threshold Indicators" you can download and install. You can choose your logic (cross over a level up or down to signal, or set indicator continuously true over or under a level. Choose your level(s) and save your custom indicator(s) with the name(s) of your choosing.

### **Re: Applying 'Threshold' filter to a Prediction Signal**

Date :6/28/2004 9:27:30 AM Poster : Maxwell Craven I don't know about a variable but here are two additional ideas:

1. Let the optimizer find the threshold.
2. Use the Fuzzy Sets plugin instead of a threshold. I have had some pretty decent results using method 2.

### **Re: Applying 'Threshold' filter to a Prediction Signal**

Date :6/29/2004 3:06:03 AM Poster : Maciej

James,

There is no global variable available to accomplish this for you. Instead and I agree that at best its a partial solution, you can do two things. Save your indicators which will allow you to have a common variable within the indicators and then within the trading strategy use variables for those values that you need to have the same. A third step

would be to save as a template the trading strategy your completed system. This unfortunately is the nearest that I have been able to get in having a common value across the board.

**Re: Applying 'Threshold' filter to a Prediction Signal**

Date :8/25/2004 12:32:39 PM Poster : James Siebert

Thanks for the suggestions, all.

I've started to use PowerBasic to program my own Indicators; This seems to have the potential for managing global variables; however testing and debugging DLLs is proving challenging in some cases. thanks again for the replies

**Re: Applying 'Threshold' filter to a Prediction Signal**

Date :6/30/2004 1:15:27 PM Poster : Maciej Maxwell, What would be the way to use the fuzzy sets plugin? I've the first fuzzy addon but haven't been able to make it sing.

**Re: Applying 'Threshold' filter to a Prediction Signal**

Date :7/7/2004 1:10:31 PM Poster : Maxwell Craven Instead of using a threshold like the wizard uses, I just put the net signal into a trading strategy and then go long or short when the signal is "high" or "low" or whatever. The optimizer usually does a good job there.



### **Prediction reliability**

Date :7/21/2004 1:26:56 PM Poster : Kermit

I've been thinking about this for some time now, so will ask the question here. Getting a prediction for each period is not as important to me as having some indication of the reliability of that prediction. I know that I can run several nets and leave one input out for each net, but that does not seem to be ideal. I have been still running NS2 and using variable data selections to run nets - I usually run eight nets - and the variation between the nets gives me some indication of the consistency of the data through time. What I am wondering is if this would be feasible to do in the Trader? Once the inputs and parameters are found, it should be relatively easy to run a given number of nets using those inputs and parameters and simply leaving out parts of the data, or, better yet, weighting parts of the data differently for each net. Could it be as easy as duplicating "chunks" of the data, possibly changing values ever so slightly, so that this weighting could "walk" through the data? When the nets are displayed, the variation should tell me something about how consistent the data is through time, shouldn't it? An indicator could do it without displaying the individual nets - just a measure of how correlated the nets are. What do you think about this, Steve? It would be easy then to let the Trader decide when to take trades based on a threshold of this correlation.

### **Re: Prediction reliability**

Date :7/22/2004 9:22:55 AM Poster : Steve Ward

I think the proof is in the pudding. I've never been a fan of adding noise to financial data (which I think you are suggesting) because financial data is plenty noisy already. (Noise is a great technique when all your patterns with the same output look much the same, like if you are recognizing machine printed characters). However, I have always liked the panel of experts approach, as long as the panel does indeed have experts, if you follow my drift. So let us know how your panel works.

### **Re: Prediction reliability**

Date :7/22/2004 10:02:20 AM Poster : Kermit

That was just an idea about how the data might be weighted. Using NS2 does work for me, as I can vary the random data selection for the training/test sets for each of the eight or so nets that I train. This does seem to me to give me some indication if the current pattern is consistent through the data. In the Trader, would it be possible to somehow weight portions of the data - say, if I chose to run eight nets as a parameter, the "bulge" in the data would be one-eighth of the data that would move from the start of the data to the end of the data? The output of the indicator would just be the correlation of the eight nets. With simply a prediction, I don't have a good idea about whether the pattern the net is looking at is consistent or not - similar patterns could have wildly different outcomes, or - the targets could all be close to each other. I do something like this by leaving one of the inputs out at a time and looking at the nets, but I am just wondering if there might be a better way to indicate variability through the data instead of across the inputs. An example of this might be the summer weather markets in the grains. Patterns could look similar for all years up to when the weather gives some indication of what the summer will be. If the weather pattern is normal, the seasonal pattern will most often work. But every few years prices get wild. And I'm just looking for an indicator that might give some indication that the pattern currently being looked at

could result in wildly different outcomes.

**Re: Prediction reliability**

Date :7/25/2004 10:34:45 AM Poster : Ward.net Webmaster

We're not sure we are following you, but we need to point out that NS2 nets can be fired inside the NeuroShell Trader (see the indicator category External Program and Library calls) , so any neural net manipulation you feel you can't do with the Trader can surely be done with NS2. Then you have all the indicators and addons of the Trader at your disposal to apply to the nets, including correlations. Maybe use the fuzzy sets addon to help evaluate those 8 nets?

**Re: Prediction reliability**

Date :7/25/2004 11:48:58 AM Poster : Matt Jarvis

I agree with using fuzzy sets to evaluate nets. In April I mentioned that on this forum. However, I am now using NI and ANI plugins which IMHO are much better than the prediction wizard nets. I suggest that Kermit use several NI nets each with a different type of internal structure if he wants to avoid using only inputs to diversify his nets.

### **Bugs, enhancements, new features, books**

Date :8/10/2004 3:35:30 PM Poster : Sunny I heard that a new revision of the program is due. I, therefore, took the liberty of adding some ideas. First, I have found that while doing a trading strategy I am allowed to enter a stop price and limit price. However, if a few days later I want to revise the formula in the stop-limit price box, I am not given the choice to do this like in other parts of the program, and I am, therefore, forced to start from scratch with a new trading strategy. Second, I would like to see more digits (at least four) added to the output shown under R-squared and correlation after completing a prediction. The three digits shown are not sufficient most of the time. Third, I would like the program to do two simple and separate optimizations. For the first one, I would like the program to optimize the time frame to be predicted. In other words how many periods ahead work best. This could be turned on or off with a check box. As for the second optimization, I would like the program to choose from among a select group, the best output to predict. Both of these features would be MAJOR time savers. I think predictions would take longer; however, I would imagine that other users are also trying to optimize both of these choices manually, and in the end everyone could have a longer cup of coffee, and the program could do what it is supposed to do best, and at the end of the coffee break we could find a list of performed predictions from which to choose. Fourth, on a separate note, I have been doing many predictions with no optimization, and sometimes I get some nice results; however, if I choose to search for the best parameters and/or rules, the program is not able to reproduce the nice results I got, and instead it shows negative results. I have been wondering if this could be due to the way the search engine goes about its work. If my presumption is correct, then maybe the prediction with no optimization should be the one chosen by the optimizer. Fifth, I think that it would be very useful if the program could do a prediction of the start, end, initial direction, reverse direction, and number of reverses that the current bar might have. Currently the program allows us to do a horizontal prediction (across time); however, it does not have the ability to do a vertical prediction (in the current bar). I believe other users would find this useful. In addition, I don't think other programs allow this. This would be very useful since the program (or desktop computers) cannot handle the tick timeframe. This could serve as a substitute for the lack of this time frame in the program. Sixth, I would also like to see with each prediction a confidence level both for the current bar and for past bars. I do not think that all predictions have the same confidence level for each bar (regardless of the timeframe). Moreover, this information could be added to the predictions or to the trading strategy in order not to enter or exit the market when the confidence level is below a certain level. Finally, I would like to see a well written book explaining all the features of the program as well as advanced uses of the same -- recipes, ideas, formulas, suggestions, uses and creations by others, etc.

Sunny

### **Re: Bugs, enhancements, new features, books**

Date :8/11/2004 10:50:34 AM Poster : Xprogrammer Regarding your third suggestion you can have it now. Take a look at the Turboprop2 plugin. I purchased it for the ability to optimize those factors you mentioned, and others including training set and neurons. I probably could have programmed it myself, but for the price it wasn't worth it.

**Re: Bugs, enhancements, new features, books**

Date :8/11/2004 2:13:28 PM Poster : Sunny X, Would you mind walking me through the procedure you used to do it. ;-))

**Re: Bugs, enhancements, new features, books**

Date :8/11/2004 3:54:39 PM Poster : Xprogrammer The procedure I used to do what? What do you want me to walk you through?

**Most recommended goal**

Date :8/11/2004 12:06:05 PM Poster : Phil Greenwood When you choose the neural network training goal, there is a "Most recommended goal" at the top of the list, even above the default recommended goal. The "MRG" is #winners - #losers - which is all very interesting, but I can't for the life me figure out why this is such a highly recommended goal! Perhaps someone could fill me in? Thanks, Phil Greenwood

**Re: Most recommended goal**

Date :8/11/2004 3:42:03 PM Poster : Ward.net Webmaster

During our tests some time ago, we felt that one gave slightly more reliable results GOING FORWARD than the others. But we couldn't test everything, and it is only a recommendation to get new users started (the usual question of new users is "Which one should I use?"). Try them all. If something else works better for you or your trading style, then by all means use it.

## Finding Elliott waves and other chart patterns

Date :8/11/2004 12:23:04 PM Poster : Phil Greenwood

I know that I'm not supposed to "covet my neighbours financial models", but I'm interested to hear anyone's experiences in scanning for chart patterns. I'm looking for impulsive Elliott waves...to a non-Elliottician, that translates to finding set-ups for price change surges - though I guess I'm would also admit that I'm working on the arbitrary assumption that there is a chart price pattern that would signal it.

I've recently acquired the fuzzy pattern plug-in, but the limitations of setting fixed segment durations seem to make it inappropriate, because I need to map patterns between swing-points. However, the issue is bigger than this, because it seems that any fixed pattern size would detect an arbitrarily small number of compliant set-ups in other types of patterns such as cup and handles, pennants, flags head-and-shoulders etc. Suggestions of how to counter this issue are most welcome...

Perhaps there's a mental back-flip I need to do to understand how to use this plug-in effectively?

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**Re: Finding Elliott waves and other chart patterns**

Date :8/12/2004 4:51:20 PM Poster : Maxwell Craven I've had good luck building systems with Fuzzy but I haven't tried Elliot waves. You can change the segments and the max with the GA, which is how I made my systems.

### **Randomisation, calculation sequence and rate of change goal**

Date :8/15/2004 2:48:41 PM Poster : Phil Greenwood I've been trying to conduct a few studies on trailing stops optimisation recently, and I've come up with a few questions that don't seem to be addressed in the documentation: 1) I've been using a random function to try to eliminate the need for an entry strategy, which might skew the results. In theory, therefore, my results will probably be different each time I run the GA on the strategy. But they're not! It provides exactly the same trades every time - which means that either the GA is absolutely awesome, or the random function isn't "randomized" each run. Which is it? And if it's not random, how can I randomize it? 2) Because of inside days it's possible for a bar to be both a short term swing high and a short term swing low...so I need to know: Is there an order in which the trading strategy is evaluated? 3) This may be a simple question to answer: Are strategies evaluated from oldest bar first to newest bar? Finally, on a slightly different subject - rate of change: 4) I want to use the GA to find fuzzy patterns that yeild rapid price changes (I mentioned this in an earlier post on Elliott waves). Is there a method by which I can set an objective of a rapid price change, such net profit / time in market? Many thanks, Phil Greenwood

### **Re: Randomisation, calculation sequence and rate of change goal**

Date :8/16/2004 11:32:43 AM Poster : Ward.net Webmaster Phil, 1) When we first introduced Random it used a new seed each time the chart was brought up, making it really random. The complaints started coming in because people couldn't see the same thing they saw yesterday. So we changed it. Perhaps we see now we have to give people both capabilities. 2) We look for longs first, then shorts. 3) Yes, oldest to newest. 4) You can try "Average Bar Profit" i.e. Profit/# Bars traded or "Average Trade Profit" i.e. Profit/# Trades

### **Re: Randomisation, calculation sequence and rate of change goal**

Date :12/31/2004 9:06:52 PM Poster : VINCE Have you had any success recently?



### **Trading Strategy - Post Optimisation Analysis**

Date :8/20/2004 11:43:16 AM Poster : John Hegarty Having built my trading strategy and optimised it is there any way that I can get a detailed trading analysis, starting from zero, from the point at which the testing completed i.e first trading strategy signal, generated by new market data generates the first trade in the trading strategy's analysis. I do appreciate that the Alerst widow does give this to a degree - but I much prefer the detailed analysis that is available from a tested strategy Similarly could say the Netprofit indicator be reset to zero and restarted?

### **Re: Trading Strategy -Post Optimisation Analysis**

Date :8/20/2004 4:46:38 PM Poster : Ward.net Webmaster There's a tip on this site called "Adjusting the Start Date of a Trading Strategy" that should help you with that. Similarly could say the Netprofit indicator be reset to zero and restarted?

### **Re: Trading Strategy -Post Optimisation Analysis**

Date :8/21/2004 5:18:22 AM Poster : John Hegarty Many thanks -apologies for asking something that has already been asked. I did a quck search of the forum, but forgot about the tips -doh!

### **Walk Forward Training**

Date :8/28/2004 9:13:23 PM Poster : Steve Eberbach As an aside, I also would really like to be able to farm out processing to other CPUs on my network, for NST. I have been working this software out harder than any other program I have, except Windows itself. I noticed that Generalize on Optimal Walkforward actually trains faster.... I believe that what I want from NST, besides realtime signals, is a simulation of what would have happened had I bought this software ten years ago, and used it all this time to trade. (given the method I use now, and guaranteed no "future leaks" from the algorithms. To me, the ability to "walk forward" is tied in very tightly to this ideal. ( but it has proven to be very tricky indeed) So I have a complex question that everybody might like to know the answer to. What I want to understand better is what is the difference between using the Turboprop2 addon in combination with the Trading Strategy Wizard, and using the Prediction Wizard using Generalize on Optimal Walkforward. (aside from the obvious greater flexibility in choosing trading rules in the Trading Strategy Wizard.) The Documentation online says that Generalize in the PW saves the best out of sample walkforwards found by the PW. I would think that if the TP2 or ANI are used with the trading strategy, the lookahead in both, and the lookahead and retrain frequency parameter in TP2 could simulate, and even improve on the "Generalize" in Prediction Wizard. As I see it the Trading Strategy Wizard can average the WalkForward result of the ANI or TS2 indicators, and do one more big walkforward for testing. Somewhere I think I read in a tip about difference between Prediction Wizard and TP2 addon that future leak was better dealt with in TP2, because PW does not keep the small number of bars "not realizable in real time" in training OUT of all walkforwarding, while TP2 does.

But, I do not really understand well enough to my own satisfaction, if these can be truly equivalent, because I do not know how these algorithms are really working, internally. For example is Generalize working independently on each walkforward, or is it saving a

best average? But, what would be sufficient for my own use, would be to know exactly how to duplicate the procedure of Generalize on Optimal Walkforward in the Prediction Wizard, using just TP2 and the Trading Strategy Wizard, as a starting point. Lets say I start with Prediction Wizard with Generalize on Optimal Walkforward, limiting my inputs to 6 inputs. I pick the chosen best

six input candidates and put these into TP2 with the same walkforward and retrain frequency, and a simple Trading Strategy like that of the Prediction Wizard. Will my results be the same? If so, then I can try improvements from there, right?? So many times I get great results only to find I made a mistake with the PW leaving some of those bars in, or ANI using a future-derived target, and they gave me false hopes which died on further careful testing.

If this story sounds familiar to anybody, I would like to hear your experiences. Also, I would like to see something more written to clarify this issue. I realize it will be a lot of work, and am willing to contribute some help. Steve

### **Re: Walk Forward Training**

Date :8/30/2004 3:59:22 PM Poster : Steve Ward I think the best start here is to better explain Generalize on Optimal Walkforwards. This algorithm does what most of you probably do anyway. It peeks at some evaluation sets as the optimizer is building different nets, then it keeps the one that worked best "out-of-sample" so to speak. That's what you do if you build a net, then see how it did, then build another, etc., until you finally keep the one that did the best out-of-sample. Now the evaluation sets it is peeking at are not the regular walk forward evaluation sets; they are older ones added especially for this purpose. So that way the usual walk forwards are still really out of sample. The down side is that the addition of the optimal walk forwards means your training data is a lot older. To bypass that protection and use more recent data (and to make the process really what you are probably doing already) you can set no walk forwards, as we described in the tip called "Using Generalize on optimal walk forwards". The whole process described above happens only once because optimization happens only once, not on every walk forward. There can be many evaluation sets that are being peeked at, however. I know it is a difficult concept, but if you set no walk forwards, only optimal walk forwards, you can then think of it as keeping the model that works best out of sample, not the one that works best in-sample. In release 5.0, the process will probably be much simplified, I hope, because I think it is powerful. I see where you are going with AT2. That net is never showing in-sample results at all. Therefore, optimization is always optimizing the out-of-sample results. If you additionally hold out some data beyond optimization data, you still have true out-of-sample results, so yes I agree it is very similar. But I don't think you will get exactly the same results. I built AT2 because I found it more natural to use the automatic WF, plus I got the benefits of optimizing things like hidden neurons and training set size, even the output! On top of that, you can optimize it in a trading strategy with rules, other nets, stops, etc. If we'd have had AT2 before the first version of NeuroShell Trader came out, AT2 would probably have been the method in the Prediction Wizard. It may yet be some day.

## **Re: Walk Forward Training**

Date :8/31/2004 12:35:07 PM Poster : Steve Eberbach I am sorry I called AT2 TP2. I don't mean to add confusion, I am trying to clear it up. I hope people don't mind my repetitive efforts to clarify this walkforward stuff. It is so complex to me I guess its best if I work on a few bits at a time. So here goes with a few more questions on Steve Ward's explanations. Paragraph 1: peeks at some evaluation sets--- are these what is now called "optimal walkforwards"? ...keeps the one that worked best--- is the "one" the whole summed up or averaged set of optimal walkforwards after one pass of retraining with a single selected set of inputs with a certain chosen set of parameters? Or is this best net selection done one walkforward at a time? Paragraph 2: "regular" walk forwards are the last ones not called "optimal walkforwards", right? You might call them "optimal", and "out of sample" walkforwards, right? But really, all the walkforwards are trained with the same inputs and parameter selections made by one iteration of the genetic algorithm (in the pro version), and what is different is that the "turbo" predictor is focussing more on fitting the input set to the target in the "generalize on (optimal) walkforwards data occurring in the WF period just after the "training data" being used by the neural net. Right? But is it true that if you do NOT select generalize on optimal walkforwards, while the nets may train longer than what it takes for best NET generalization in relation to least error fitting their assigned target ("actual"), still the genetic algorithm selecting inputs and parameters is using the optimal walkforwards to pick the inputs and parameters which generalize best in the walkforward periods in the set of evaluation sets you call "optimal walkforwards", isn't it? So would a correct explanation be something like this: The prediction wizard uses two optimization techniques simultaneously, an "inner" (loop) optimization which uses a neural net to fit a set of inputs to a target (called "actual"), and an "outer" optimization, in the pro traders, which further selects the best choice of inputs and optionally, their parameters, for each pass of the retraining through all the walkforwards up to the end of the "optimal walkforwards" training period, and just evaluates the retrainings for a selected number of walkforwards thereafter. (for your inspection of what would have occurred if you used your net for trading, and retrained that net periodically for some out of sample walkforward inspections of how you would have done had you kept that same net going for a while with the same inputs and parameters) There are two kinds of walkforwards in the Prediction Wizard: optimal, which are used to select inputs and parameters via a genetic algorithm, and optionally selecting nets best fitting the actual target just after the training interval, and regular, which are a truly out of sample set of retrainings of the neural net based on the same previously selected set of inputs, parameters, and target time series to be "predicted". When you turn on Generalize on optimal walkforward, on each pass trying a new set of inputs and parameters, the turbo-prop net which best fit the target, or actual, in the WF periods called optimal walkforwards, is the net which is saved. But, this net still is retrained using the same inputs and parameters on each walkforward, optimal or regular. Would it be clearer to call them "calibration walkforwards", and "out of sample walkforwards"? Paragraph 4: "When you select no walkforwards"--- Do you really mean "When you select no out of sample walkforwards"? And back to paragraph 2: " means your training data is a lot older...." Isn't "training data" all data NOT "out of sample"? You mean in this case part of the training data, the more recent in-sample data is used for the "calibration part" of training the turbo-prop nets, and only the earlier data is being used in

iterating the neural network convergence to best fitting the "actual". I guess that's enough for now. Maybe I'll try to explain in my own words the addons later after I get the Prediction Wizard right. Please help me get my explanations right, if they are not right so far.

### **Re: Walk Forward Training**

Date :9/1/2004 4:30:29 PM Poster : Steve Ward I'd say you have it right! Now if anyone complains when we simplify the prediction wizard in release 5.0 they are going to have to prove they understand all of this before I'll have sympathy.

### **Re: Walk Forward Training**

Date :9/1/2004 6:12:17 PM Poster : Steve Eberbach

Thanks for the pat on the back for my efforts, but I'm afraid I still have not earned your sympathy. I still don't understand all this.

Quote from previous post: "...keeps the one that worked best--- is the "one" the whole summed up or averaged set of optimal walkforwards after one pass of retraining with a single selected set of inputs with a certain chosen set of parameters? Or is this best net selection done one walkforward at a time?" This was a question, not an attempt to explain! It seems that here is yet another feedback loop. I think I got the other two, but this one is still not clear to me.

With the answer to this question, I can try to make a drawing called "How the Prediction Wizard Works" with comments and arrows. Steve

### **Re: Walk Forward Training**

Date :9/3/2004 9:44:06 AM Poster : Steve Ward

Here's how it works. The GA is finding input combinations. Each such combination is used on the training set to train the net. Then that net gets applied to the first optimal wf evaluation, then the net is retrained on the same input combination and applied to the next optimal wf evaluation, etc, until all optimal wf evaluations are finished. The input combination which produced the most profit (or whatever the objective function is) on all the optimal walkforwards as a complete trading sequence is remembered. Then after the GA is totally done that remembered input combination is used to retrain the nets for the regular walkforward evaluations.

Now the difference between "Generalize" on optimal walkforwards and the "normal" use of optimal walkforwards is subtle, because in both cases the inputs that worked best on the optimal walkforwards are the ones that are kept for later. The difference is in what the GA uses as a fitness function to improve itself. In "normal" use the GA is seeking the best performance on optimal walkforwards. In "Generalize" the GA is seeking the best performance on the original first training set. Therefore, the Generalize version is only rated on how well it works out of sample. The normal version is evolved to work well out of sample. In both cases, the out of sample set is compromised, but the normal version compromises it more. But since both compromise it, that is why we added the additional optimal walkforwards and kept the real walkforwards pure.

### **Re: Walk Forward Training**

Date :9/3/2004 4:14:34 PM Poster : Steve Eberbach

Your most recent explanation helps me a lot. I think I get it now, but I need a wee clarification before I have earned your sympathy by proving I really "get it".

You wrote: In "normal" use the GA is seeking the best performance on optimal walkforwards. In "Generalize" the GA is seeking the best performance on the original first training set.

Do you mean: .....in "Generalize, the GA is seeking the best performance of all the optimal walkforward evaluation sets combined using only the original first training set to train the network?

In other words, is Generalize using a once-trained first net and one long out of sample "walkforward" evaluation instead of many smaller frequently retrained ones, then for out of sample evaluations, resuming the shorter retrain-walkforward sequence?

I interpret it that way, because the dates on the Prediction Analysis Reports show "optimal", and the subsequent "walkforward #x" selected in the "Network" column of the training results window to be dated this way.

### **Re: Walk Forward Training**

Date :9/5/2004 8:17:03 AM Poster : Steve Ward

Yes, it is always using one long out of sample trading session from all optimal walk forwards. To clarify - you don't get my sympathy for understanding. You get my sympathy if you get upset about any future simplification of the Prediction Wizard. I figure only those who understand have a right to complain if and when we simplify things.

### **Re: Walk Forward Training**

Date :9/5/2004 1:26:08 PM Poster : Steve Eberbach

Thanks, Steve! What I am working up to next, as I asked you earlier on this thread, is to duplicate the Prediction Wizard with an AT2 combined with a Trading Strategy, and actually get the same results. If I succeed, then I will believe I understand it well enough. Call this a homework assignment to myself, to qualify me for Steve Ward's Certified NST Consultant Certificate. Seriously, I would like to see the Prediction Wizard simplified, but I want more power and flexibility, not less!!!! So I want your sympathy now, before you finish rewriting the Prediction Wizard! I wish to participate in its improvement, so I do not "get upset" when you change it, but my suggestions would not mean much if the person(s) I am making suggestions to think that I don't even understand how Prediction Wizard works.

I noticed a post just today from a sophisticated user about the Prediction Wizard. One of his suggestions is one I was planning to write you about at a later time, that is, making it easier to freeze the parameters of selected inputs chosen during an optimization run. "Freezing" sub-models and keeping them in a list is the essence of the Group Method of Data Handling (GMDH) which you have implemented in your Neuroshell 2. It works even better in NST, but presently you have to do it manually.

This technique has not only doubled my scores, but has saved HUNDREDS of hours of computing time. As I work on a project, adding new ideas for indicators, each run starts with my best so far, and spends its training and searching efforts trying to break the old Champions' records. Great suggestion!!! And while it is a new feature, it is also a simplification! And my list of best "frozen inputs" is a great way to document my

progress.

### **Wizard Design**

Date :9/10/2004 11:27:13 AM Poster : Steve Eberbach Since there are comments about an approaching update of the Prediction Wizard, I decided to submit my thoughts to the forum. This one is very important to me, and may help others using NST pro. I was reading an interview with one of the "Real Traders" who trades Long positions only in his IRA. It struck me that a very simple change to the interface of both the Wizards for the next release would be very helpful. In both wizards there is a dialog for setting longs, shorts, or both to be traded. -- a dialog: "use the tabs below to specify rules for when to buy or sell" in the Trading Strategy Wizard, and a dialog: "Trading positions used to calculate statistics" in the Prediction wizard. Why can't we take advantage of the ability now in NST to add several symbols to one chart, and make those three choices in the wizards be "Position A, Position B, or Both", instead of Long, Short, or Both? In this case Position A could be Long "Symbol Top Symbol on chart"), and position B be Long symbol "XYZ". Instead of just selecting long or short as it is now, the alternatives would be 1: "long or short the default symbol" (only), 2: long or short another symbol (only, 3: Both 1 and 2. Normally alternative one, two, three tabs or buttons, A, B, Both, would mean the same as in the present NST, the choices would mean "trade long the default symbol only" , "trade short the default symbol only", and "trade both long and short the default symbol". What changes would only be that each tab or button could be set to read a long/short (choice of symbol), (one position or cash) or either of two positions (switch between choices). The systems would still retain the ability to be out of all positions and be in cash, as they do now, given the 4 decision thresholds available in the Wizards The big difference is this would enable optimizing such IRA-useful strategies as, say, mutual fund or Sector Fund switching. I would hope this expands NST's potential market a lot! Steve

### **Re: Wizard Design**

Date :9/13/2004 4:37:41 PM Poster : Steve Eberbach I have given many headaches' worth of thought to the idea of user fitness definition, and I think I see that the ability to program the function would be nice, but very hard for most people to get up to speed on. Also, the present definitions, (with a few additions) I think would be sufficient in themselves. What I REALLY want to do, and what I think is more in line with the NeuroShell Trader Pro design philosophy, is to specify, optionally, when a certain trading statistic is satisfactory to my trading expectations, and allocate any of the Genetic Algorithm's remaining effort to my NEXT priority, and so on.

The way NST is set up now is to set one criterion's goal to infinity or zero. The GA, being very obedient, will try to do that without consideration of anything else. Even optimizing one ratio or product is like throwing darts, or running a Soviet 5-year economic plan by specifying one goal.

So I see the interface for setting up fitness, particularly for the Prediction Wizard, which needs this badly, is to specify two or three criteria, from the existing list, and also specify what number Priority One should reach before the training switches to adding "score" to the Second and Third priority.

I think a such a prioritized tradeoff with all reachable objectives would be enough to

get the GA to stop running off into Bizarro Land. Before, I used to think the best way would be a mixture of the objectives, together striving for infinity and beyond! But now I know better. As the effort made by the optimizer increases, you get to a point where out-of Sample results are increasingly sacrificed for the sake of the greedy training and selection algorithm stuffing all the gold into the insample results. You have to STOP the algorithm before it gets to that point of RAPIDLY diminishing returns out of sample for gaining tiny further improvements in-sample, and switch to another goal which might be easily achievable, but cause less sacrifice in out of sample performance consistency.

Then I would combine several of these models which easily reach modest goals consistently into my final "Expert Trading Committee".

### **Re: Wizard Design**

Date :9/29/2004 1:19:01 PM Poster : Steve Eberbach I have some more comments on NST Wizard design, in an effort to help make NST easier to learn and use, with little as possible change to the features already in NST, but more emphasis on the way we access those features....

1. Being long or short one stock is like investing your money in two different securities: Long Stock A or Short Stock A. You can just as easily switch your money between Long Stock A and Short Stock B. That way you could be more neutral with respect to changes in the broad Market. Why are the interfaces in NST not able to reflect the choice of any two positions, either in one security or two? The only difference should be that if you have at least two securities in your chart, you have the ability to choose which two you are trading between in the Trading Strategy. (or Prediction Wizard)

2 I like the Dates dialog in the Trading Strategy Wizard: It makes sense to a trader learning NST. It took me a while to realize it shows nearly the same information as the Dates dialog in the Prediction Wizard: Most importantly, the Date separating Optimizing by the Genetic Algorithm and Paper Trading (simulating out of sample results), the date of starting optimization, and the date ending it.

The main difference is that you have to count up days in the walkforwards to figure the dates out in the Prediction Wizard.

Why doesn't NST always start out with the Trading Strategy Wizard, and let you APPLY the Prediction Wizard, using only what more complexity is needed to add the Prediction(s) to the Trading Strategy? If you want to simply use non-trading objectives, like minimize errors, the trading checkboxes in your Strategy would reflect this by being turned off. If you checked them "on" you could see your signals and statistics as usual, except the G.A. would not be using the trades for optimizing. NST could even have a "Prediction Wizard" Trading Strategy Template, which does exactly what the Prediction Wizard does now. That would make it easier to learn and navigate the Prediction Wizard without changing its capability. I would prefer that the walkforwards be specified in terms of time span and step size separately, so they could overlap, and even be different settings for the Optimise dates, or the Paper Trading Dates, (out of sample simulation). And why not call the Walkforwards Paper Trading Walkforwards instead of just Walkforwards? And Optimised Walkforwards, instead of "Optimal Walkforwards"?

The Dates dialog is so important IMHO, for understanding what NST is really doing, I think you should be able to view and set all the "dates" from it: Charting Beginning and End of loaded files, Frontier Date between Paper Trading and Optimising by the GA, and the Training and Evaluation data set structuring when using the Prediction Wizard and walkforwards. Having this all in one place instead of having to go looking for different parts would be a big help.

3. A couple of places in the interfaces of Version 4.5 there are lists of items to select from. The usability of the program would increase if there were some options, like radio buttons or checkboxes next to the items. I see three categories I think are most valuable.

A. Multiple securities in a chart: Select whether each security should be left alone or re-optimized (and included in the performance evaluation averages or not) when running the optimization, right by the name of the security in the dropdown listboxes. Maybe here you could select which charts to send to the trading strategies in the chart to implement the switching of capital between two (or two sets of) securities.

B. Multiple Rules in Trading Strategy: checkbox-"GA may Optimise Parameters": and choice of: required rule (which GA may or may not optimize), excluded rule, or let optimizer choose rule whether or not the optimizer is allowed to change parameters. The advantage is faster experimenting without lots of typing, and the saving in plain view INSIDE your saved charts, of rules you might like to try again later, without having to print them out, or save many different versions of charts, to recall them once you have written them. This might also be easier to understand than the present dialog box choices you have to navigate away from the rules to see.

C. Parameters of Indicators optimizable by GA: Now you can set an input to fixed status (to save it) by opening the "plus" in the tree dialogs for inputs or outputs, and setting the minimum and maximum of each parameter to the same number.

Options settable there, like the Rules in Trading Strategy, would be very convenient for the user of NST: one checkbox- "GA may optimize" (if not checked, the parameter are "frozen" by being set to max=min) and option buttons for each input (not individual indicator parameters) to be: required, excluded, or available for choice by the optimiser. (R,X,C, labels or red,black,or green bullets with pulldown menu to change-whatever the programmers think is cool). This could be done for the indicator in toto, without even clicking on the + symbol) or parameter-by-parameter, or both. The in toto version would work in NST Trader as well as Trader Pro.

Again this could help reduce typing, and help document the process of developing Trading Strategies and Predictions by letting you experiment without much typing, and "saving" in plain view your previous experiences as you progress in developing a chart.

And all this with minimal changing of the NST Wizard Design as it is now, mostly some simplifying and making it more flexible at the same time. Denizen2, how would this help those items in your suggestion list? Respectfully Submitted, Steve Eberbach

### **Wizard Design2-More Options Needed**



Date :9/11/2004 11:30:21 AM Poster : denizen2

When using either the Prediction or Strategy Wizard, my 'standard' approach is to begin with the Input Options that specifies that ALL rules be selected & applied (optimizing only the parameter values). This presumes, of course, that I have some reason to believe that all the rules are 'probably' relevant. I have found that I get 'better' results doing this BEFORE selecting the option to optimize all the rules (and therefore use only a subset of the rules). This is especially true when some of the rules contain LEVEL threshold parameters, perhaps because it takes much longer for those kind of rules and might tend to be 'ruled out' more quickly than is really necessary. The current Wizard design accommodates this approach by allowing me to 'manually' do the optimization in two steps. Ok, so far.

However, I would ALSO like to be able to make that choice (i.e., optimization of only rule parameters, OR opt of rules and parameters) so that it applies to ONLY exits or entries rules. Currently, I have no way to specify the Inputs Options, separately, for the Exits and Entries rules. I believe this kind of design change could be implemented by just adding additional checkboxes on the existing tab. It would greatly benefit the users to have this additional flexibility.

### **Cyber indicators**

Date :9/26/2004 8:56:55 AM Poster : Matt Jarvis

The Ehlers cyber indicators seem to produce some great signals on daily charts even without optimizing, but not as good on intraday charts. Anybody know how I can get 1 minute charts to work as well? (I trade futures so I don't like to stay in overnight).

### **Re: Cyber indicators**

Date :9/27/2004 9:18:24 AM Poster : chris wong

try the stochastic rsi. it works well for me. i think ehlers may have been concentrating on daily charts in his book, but if you use the optimizer carefully the cyber indicators also do quite well intraday.

### **Re: Cyber indicators**

Date :9/30/2004 2:00:01 PM Poster : Maxwell Craven

Chris, you are absolutely right and I thank you for sharing that jewel with us!

### **Re: Cyber indicators**

Date :1/8/2006 5:12:55 PM Poster : John Coleman

Chris, were you refering to stoc RVI in this post? I have not heard of stoc RSI, if it exists, is it another add-on?

regards, John

### **Re: Cyber indicators**

Date :1/9/2006 11:29:51 AM Poster : chris wong

no, not another addon. stochastic rsi is in the cybernetic addon.

### **Re: Cyber indicators**

Date :10/17/2004 11:17:35 AM Poster : alex amos

The problem is not with the Ehlers Indicators which are excellent - the problem is with the time frame. I have experimented a lot with 1 and 2 minute bars but there is so much noise (my term) that it is impossible for ANY indicators to get a handle on the movement. I think you have to work with at the very least 5 minute charts. Recently, following a tip from Support, I was able to adjust the output of a Cybase indicator on a 2 minute chart to correspond pretty accurately with its ouput on a 5 minute chart. You do this by plotting the indicator on a 5 minute chart and then exporting the data to your 2 minute chart. You then adjust the inputs of the same Indicator on the 2 minute chart to correspond.

### Turtle trading

Date :9/27/2004 8:43:10 AM Poster : Wanttobea Turtle

Hi,

I'm new to trading strategies and I came across the original turtles trading strategy, I want to confirm if I'm on the right track, I list the turtle requirement and what I think the Neuroshell trading strategy should be:

- . Turtle = Long Entry: Based on a 20-day breakout (today's close exceeding the high of the preceding 20-days)
- . Neuroshell = Long Entry: Trading wizard ( + High Channel Breakout(High price, Periods)...is this correct condition)
- . Turtle = Long trailing stop: Turtle stops were set at 2% below the entry for the long position.
- . Neuroshell = Long trailing stop: Trading wizard(+ Trailprice%(trading strategy, percent trailing).
- . Turtle = Exit: was 1 a 10 day low for long positions Neuroshell = Long exit (+Low channel Breakout(Low price, Periods))

Can somebody inform me if I'm on the right road?

Cheers Wanttobea Turtle

### Re: Turtle trading

Date :9/28/2004 12:10:06 AM Poster : Maciej

You're on the right track. However you'll probably find that the approach won't be particularly profitable. For me, the real secret of the Turtles is not the entry techniques rather the money management that was deployed. You'll find that implementing these in NSDT will be quite a challenge using the ATR indicator in your stops and exits. Furthermore, the Turtles would pyramid in when the going was favourable (0.5 ATR from memory) so in NSDT you'll need several trading strategies each one dependant on the previous one - ie if already long and price moves in my favour by 0.5 ATR then enter another long and move the stops on both trades up by 0.5 ATR. To complete the challenge, the Turtles used a method of normalising the size of a trade depending on how much capital was available - both increasing and decreasing and also taking into account the volatility of the commodity in question - so the equivalent of one soybean contract could be say four corn contracts. Finally the entries/exits could occur at any time during the session including the triggering of multiple entries, so if there were a sudden rise in a commodity during a session then the day could end up with several trades by session end. To simulate that I feel requires that you use intra-day data.

I'd be interested in seeing how you get on with this idea but this is an example of an approach to trading that's quite complex to simulate in NSDT even though the written description of the process is quite straightforward. For what it is worth I don't know of any software where one could easily implement the whole Turtle approach. The challenge is worth pursuing as if you'll crack this you'll be able to use a sound money management technique that will allow you to replace the fairly crude initial entry techniques by others and get potentially even better results.

### Re: Turtle trading

Date :10/15/2004 1:24:30 PM Poster : Maciej

Hi again. I was wondering if you had made any progress on your bid to recreate the Turtle philosophy?

**Re: Turtle trading**

Date :10/22/2004 10:08:25 AM Poster : Robert Van Eyden

Thank you fro your comments I shall keep you upto date

Regards Robert

### **Lagged indicator question**

Date :10/12/2004 6:40:38 PM Poster : Manny LaCarrubba

I'm new to neural networks and have a question regarding the use of lagged versions of an existing input as an additional input to the net. In my reading I note that this is not uncommon but, does it not simply duplicate data that has already been input? What is it about the way the net looks for patterns that make this technique useful? Would it not be more beneficial to use the difference between today's value and the value  $n$  days ago than simply using the value from  $n$  days ago? Thanks in advance for any information you can share.

### **Re: Lagged indicator question**

Date :10/13/2004 11:08:08 PM Poster : Philippe Lonjoux

Let's assume that the stock market is a dynamical system. The time series you choose as input should be the outcome of all interacting processes that drive the price. It should contain information about the dynamics of all important variables involved. Fair enough.

In a more academic way, these variables satisfy a set of several first-order differential equations.

Now, it has been shown (Ruelle 1980) that a time series and its successive lagging copies is enough to fully describe the dynamics of the system. The shifting is equivalent to first-order differencing. Therefore, lagging versions of the initial input become additional variables.

The neural network then detects nonlinear relationships among these variables, and creates nonlinear approximations to the underlying generators of data. Here you go.

And as you suggest, your original input time series should be detrended. You will achieve much more accurate forecasts when using percent changes versus the actual closing value of stocks.

### **Re: Lagged indicator question**

Date :10/14/2004 11:31:46 AM Poster : Matt Jarvis

In my tests I have found that using lagging type indicators is usually more effective than lags of the price, but I agree about the detrending.

### **Re: Lagged indicator question**

Date :10/14/2004 4:40:01 PM Poster : Manny LaCarrubba

Thanks for your comments. I was not referring to detrending here. I really meant a lag of either price, or some technical indicator that is being used as an input, as an additional input. This technique clearly duplicates data that is already being provided to the net. What is it about the way nets look for patterns that makes this useful?

Philippe, your comments regarding time series and their successive lagging copies being able to fully describe the dynamics of the system were most instructive. Thanks again. Clearly there is more going on, however, or forecasting would be very much easier than it is! On 10/14/2004 11:31:46 AM Matt Jarvis wrote: In my tests I have found that using lagging type indicators is usually more effective than lags of the price, but I agree about the detrending.

**Re: Lagged indicator question**

Date :10/15/2004 5:16:57 PM Poster : Steve Ward

Forecasting isn't hard except in the financial markets. It is hard there because it is extremely difficult to get inputs that actually affect the future (so called leading indicators). If you find them, they don't last more than a month or so because a lot of people find that they work, and the markets adapt. With regard to nets, you must be thinking that since they study hundreds of bars of inputs, that all previous bars are also in the input set, so to speak. Only the inputs of the current bar are used to make a forecast by "comparing" the current bars' inputs with the inputs of all bars that have been studied. Some nets, like our recurrent nets in our Neural Indicators addon, automatically feed into the inputs a historical "context", making lags less necessary. Our Adaptive Net Indicators addon has nets that automatically feed in a large number of lags. Unfortunately, however, the more inputs you feed a net (or any type of model really) the more you tend to overfit. You can actually get a great net just feeding in random numbers as the inputs if there are a lot of inputs. That net won't do well into the future, however. That is the main reason we suggest using only about 4 or 5 net inputs.

**Re: Lagged indicator question**

Date :10/15/2004 8:08:08 PM Poster : Manny LaCarrubba

Thank you Steve. I think I got it now.

### **Cost of Staying in Trade Overnight**

Date :10/23/2004 6:05:05 PM Poster : Steve Eberbach  
A feature I want to see added in ver 5.0 is the ability to specify the cost of staying in a trade overnight, usually expressed as a percentage, as is done for daytrading brokers. The trading site "Dukascopy" <http://www.dukascopy.com/english/welcome/> allows trading stocks in the same style as FOREX, specifying spread in "pips", or Percent points, using large leverage as is typical in FOREX. This is an interesting and quite appealing alternative to the larger spreads and more complicated spread structure involved with using options, and is certainly easier to simulate in a computer for the purpose of deciding tradability. Their commission is an entry spread percent charge, plus an overnight percent charge. These charges vary with the instrument traded. If more brokerages move to this paradigm in the near future, and I'll bet it will happen soon, it would be cool to be able to simulate this in the costs dialog of NST. Anybody else interested in this??? Please comment!  
Steve Eberbach

### **Re: Cost of Staying in Trade Overnight**

Date :10/25/2004 7:10:30 PM Poster : Maciej  
Steve,

Dukes looks like a variation on so called spread betting that's popular in the UK - another site is the CMC Deal4Free. The interest in these is essentially based on the level of spread - when a market is liquid their spread is small and therefore interesting. However this spread can become bigger than the cost of a contract say for the mini DJ as it becomes progressively less advantageous compared to a normal broker as you increase the bet size. Another reason for these types of sites' popularity is that for UK residents all gains are tax free which is not the case for normal brokers. The biggest issue with them from a NSDT perspective is the data can only be approximated as they do not provide data downloads of their bid / offer prices which in my experience are not a simple question of a couple of pips either side of a say Esignal price. Their spreads tend to be slanted against you depending which way they think the market is going so their use for day trading is not compelling.

### **Re: Cost of Staying in Trade Overnight**

Date :10/26/2004 9:16:13 PM Poster : Steve Eberbach

Thanks for the other sites' names. I will check them out. Yes, the commission is quite steep, but I thought it much better than options, where open interest is only about 2000 to 10000 contracts maximum, and spreads run about a dollar per share.

I thought that by tracking their "valid price" to see what side of the bid/ask from Tradestation they are running, I could calculate their slippage and simulate it quite exactly. The only problem I have is the ten-second delay, which requires your trades be done in a quiet market. That is not a problem for me, since I avoid the situations where I risk a lot of bad fills.

I have written to them asking questions, but they have not responded. In particular, I asked if their realtime "valid-prices" are the prices I can execute, and if they are what they provide as historical data. They claim I can execute a fixed price in a ten-second window without change. So if my order transit is less than ten seconds, I get an exact fill, regardless of what the market does while my order is being transmitted. If their "valid price" hits my limits, my orders should execute. I should

also be able to get market open and close minus their spread on the first side of the trade only, and exact fill on the exit. Their silence is not a good sign, but I still hope to learn more, since if this grows like the FOREX ads are growing in the magazines and press, this business model will be a retail brokerage competing ground due to the ease of normalizing various instruments to a common (standard) trading simulation model. Also I hate the execution of options in my experience, and would tolerate quite a large commission for a faster more liquid offering of leverage services on common stocks. The stock futures still seem a bit thin to me. Fifty pros all noticing my lonely little order, and competing to see if they can get my stop. I would prefer their making me an offer good for a time, and if I like it I can take it. I want to set up small portfolios which can be dynamically optimized. And if their computers are set up with a rigid trading model, their prices versus other quote sources might become a useful trading indicator.

Of course, if I hear reports from serious traders that they are a rigged scam house, I can spare myself the anguish of yet another what you see is not what you get. And I am fearful of them disappearing overnight, saying suddenly they are "under investigation, please be patient", meanwhile the phones are disconnected.

**Re: Cost of Staying in Trade Overnight**

Date :10/28/2004 5:30:02 PM Poster : Maciej

Steve, you want to compare with deal4free - their trading software is pretty neat, the charting less so. I always get the price quoted but you need to be pretty quick. Like I say the biggest issue is that their prices are "synthetic" with the spread slanted according to the way their software thinks the price is going so its dearer to buy in a rising market and dearer to sell in a falling market. I don't think its economic for anything but small position trades.

**Re: Cost of Staying in Trade Overnight**

Date :11/1/2004 10:33:16 AM Poster : Steve Eberbach

Maciej: I looked at Deal4Free, but could not see how they let you download their historical quotes. What is your experience in comparing their historical quotes with the prices actually downloadable from, say, Tradestation or E-Signal? I would need the historical prices to test an actual trading strategy simulation with NST, to see what effect their slippage really has on my returns.

**Re: Cost of Staying in Trade Overnight**

Date :11/2/2004 5:08:37 PM Poster : Maciej

There is no way of downloading data in any of the known formats. What I've done is to set the spread as the cost when working with NSDT. I use the commission screen to set this spread - If I take for example the DJ - their typical spread is 5 points so I'll use 10 to buy or to sell. This makes my simulation tougher than real life. Whilst I don't have the historical data to do an exact comparison, twice the spread covers the "stretch" of the spread. Another factor to consider is their actual liquidity in a given stock/index. If you are dealing in the less popular stocks the spread will typically be larger (expected) but their stretch also as they will offset your trade against others or if necessary in the real market. All in all this type of system is in my opinion ill suited for day trading



more for swing/position trading.

**Re: Cost of Staying in Trade Overnight**

Date :11/6/2004 8:48:08 AM Poster : Darek

to Steve Eberbach: I can give you historical data. For free. What do u need?

**Re: Cost of Staying in Trade Overnight**

Date :11/6/2004 2:45:20 PM Poster : Steve Eberbach

Thanks, Darek, I appreciate that. When I am ready, I'll get back with you.

For Now, I am still comparing the prices from Dukascopy, which are freely downloadable from their site for import into Excel, with the spot prices and the futures prices from TradeStation, who is presently a broker for me, and primary data supplier. Unfortunately this is tedious work and is taking me some time.

As Maciej says, this trading of "Contracts for Difference", (by the way, the best keyword I have found for searching thru Google for new brokers of this type of derivatives) seems best suited for swing trades which by nature often are kept overnight.

What I will need in the way of historical data later on, is samples of the data from the various vendors of "Synthetic Price Data" which includes the "slants" Maciej mentions, so I can see if their slants ruin my limit orders. I could get data from Dukascopy, but not Deal4Free.

I got a reply from Dukascopy and I quote some information from their letter:

"...the price that we use in our system for each 10 seconds is (high+low)/2 of the last 10 sec candle. Also the 10 sec delay is not included in our historical files (if you are talking about our CSV data). You can simulate this delay yourself by activating your trading orders at the price of the next 10 sec candle. As to our price quotes, they are different from the quotes supplied other quoters by a few pips: we take these into account while generating our quotes. Finally, our stop loss/take profit orders are treated the same as regular orders in terms of commissions. There is a small extra charge for Price Guarantee orders (they guarantee opening/closing an order at an exact price; our regular orders including stop loss/take profit orders open/close at a price of the next 10 sec price tick). The value of this extra charge can be viewed while generating such orders from base-DDS. We hope this was of help..."

My swing trading strategy relies on using limit estimates to get my orders ahead of other traders' stop orders, so I will get filled when my anticipated limit gets matched against the stoporders put in after my limits are put in. I am afraid that the traders working closer to the data vendors might see my orders and match theirs (inhouse traders) and skip over mine, unless I can leave enough money on the table so that there are enough stop orders past my price that I am sure to get filled.

So the historical data I am looking closely at is what their reported Highs and Lows are in comparison with other data sources, in various time frames, as well as how honestly they report the volume in a timely manner, so I can calculate the liquidity of the market near these highs and lows. I am interested in whether others in this forum have done any such data checking, and what they found out.

**Newbie looking to learn on stocks/futures**

Date :11/25/2004 7:18:54 AM Poster : dann0 Hello-I'm new to the Trader, and I understand that it does best with instruments that are volatile and tend to cycle. Does anyone have suggestions as to some stocks or commodities that I can take a look at as recent examples? Not looking for any major secrets here...just some tips as to which instruments get started with so that I can get a feel for the Trader! Thanks much, dann0

**Re: Newbie looking to learn on stocks/futures**

Date :11/25/2004 1:37:47 PM Poster : Maciej

I suggest that you could do worse than start with the major indices. You'll probably be able to recognise visually the stocks in them that are likely candidates and also confirm your ideas with some simple indicators among which ATR which can give the volatility. Only other caveat is to make sure that there is liquidity in that stock using volume. Otherwise you're on the right road.

**Re: Newbie looking to learn on stocks/futures**

Date :11/27/2004 7:31:17 AM Poster : dann0 Thanks, Maciej. That gives me someplace to start! dann0

### **We need an Objective Function that considers intratrade drawdowns**

Date :12/3/2004 5:08:19 PM Poster : Brad Stern

Of all the objective functions in the trader available when building a trading strategy, none of them consider intra-trade drawdowns (give back of profits). All that matters is if you lose money from the entry price. If you ride a Parabolic trade up 100% and then have the price go all the back so that the trade closes out with a 1% gain, the objective functions view this as ok as long as the 50% decline in P&L did not occur from your entry point. If any of you think an objective function that considers intratrade drawdown to optimize on is important, please let Steve know. Currently, this is not considered to be desired by a majority of users.

### **Re: We need an Objective Function that considers intratrade drawdowns**

Date :12/4/2004 2:15:21 PM Poster : Steve Eberbach

Brad: I agree almost completely. I have long debated (even with Steve Ward) the need for being able to define objectives of trading.

Recently, I have concluded that really we need even more to set constraints on trading so that the optimization does not waste time looking at possibilities which are impractical, as there are so many. Better, I think, to be able to set limits on an indicator you can write with NST development tools: "Total Intratrade drawdowns". or "median intratrade drawdown", or "average intratrade drawdown", or "average of worst 10 percent of intraday trade drawdowns", and tell the optimizer to skip the whole calculation and "kill" the candidate if the constraints you choose are violated, or violated "too much", (softer constraint which penalizes the objective function) After all, the objective really is Profit, but other considerations are so unique and there are so many that it would be hard to fit them into even a laundry list of magic objective functions. And it might be too hard for users to learn a whole new art of objective function design. See Google for "Sortino Ratio", for example, and you'll see it's a can of worms.

And better with respect to adding more complexity to NST to simply enable an indicator YOU DEFINE with tools already in NST to constrain the training, I think. Let the optimizer deal with simple objectives, but be able to block the blind alleys where you find them and fix mistakes the objective function is too simple to deal with.

Steve Eberbach

P.S. Given his track record so far, Steve Ward might even be able to figure out a way to optimize your own constraints!

### **Re: We need an Objective Function that considers intratrade drawdowns**

Date :12/5/2004 8:32:32 AM Poster : Steve Ward

Several users have discussed the issue of custom fitness functions with me, but the only debate has been the priority, ie, when not if. True, I don't think it will be a silver bullet, but I do think it will be useful, and is certainly oft requested. However, the things in 5.0, like sending trades to brokers, new types of bars, drawing on the chart, workspaces of several charts, etc are things users and prospects alike request EVERY day. Sometime after these are introduced, I suspect we will get to custom fitness functions, but it won't be easy to build, or we probably would have just tossed it in by now. There are many features being

requested, but we have to make priority choices. For example, one user is vehement that we must be able to pass strings to a DLL, and he is quite mad with us that it isn't there yet. I agree with that too, but should that and custom fitness functions be programmed before new bar types and a broker interface? I'm thinking that once 5.0 is out, we need an automatic online voting system so we can see objectively the level of interest in the various feature requests. Contrary to what some of you believe, we don't implement features based on MY trading needs and desires (we only develop add-ons based on that, because add-ons are done by other programmers who normally work on our other non-trading products). So I continue to encourage more of this discussion.

**Re: We need an Objective Function that considers intratrade drawdowns**

Date :12/5/2004 2:08:57 PM Poster : Steve Eberbach

Steve: (and others interested in "fitness" definition)

By debate, I DID mean priority, since this has been an issue for a long time, and back in the days we made a voting wish list, the fitness issue was high on the priority of wishes, but people also realized that the effort required was so great, that when required programmers' time is added into the mix, that cost trumps the "priority" of having a full blown Fitness Wizard.

The biggest reason I suggest using constraints in optimization is because I thought that would be much easier and faster to implement as a first step to making the whole Genetic/Neural optimization package more complete, as it already is in GeneHunter. Easier and faster means sooner. I would rather have a little now, than the whole enchilada someday in the distant future. After all, we gotta walk before we can run.

Secondly, I feel that even simple constraints can solve over 90% (maybe even 200%!) of the job that would be done by writing fancy custom fitnesses. This is evident when you look at Ranier Storn's Differential Evolution page on the internet:

<http://www.icsi.berkeley.edu/~storn/code.html>

Since the Indicator Wizard is already highly developed in NST, and since GeneHunter is also already embedded in NST, I thought that some integration of what is already programmed could be done quickly, and that once users got ahold of even a rudimentary capability, everyone might be able to explore and discover exactly what, if any, more work needs to be done on custom user programming of fitness.

Additionally, I still believe that simply adding an ability to penalize already existing NST fitnesses (by using the Indicator Wizard to write a "cost" indicator which can be applied to each trade just like a slippage or commission cost, right in the costs dialog box) also could handle (most of) the job that custom fitness functions would do. That suggestion was my way of asking "wouldn't it be easier to accomplish much of the purpose of custom fitnesses without a major rewrite of the whole NST program structure?" That way, a small part of the if and "when" could happen now, rather than someday after all the newer more pressing wishes which keep growing like mushrooms all get finished.

**constraints**

Date :12/6/2004 10:00:17 AM Poster : Brad Stern

Hi Steve's and thanks for the input.

While constraints to speed optimization would improve the program, there is nothing that looks at daily P/L drawdown from a peak. Therefore, the ability to make custom constraints would not benefit me here.

**Re: constraints**

Date :12/6/2004 4:35:29 PM Poster : Matt Jarvis

Brad, take a look at maximum/minimum value since entry activated.

**Re: constraints**

Date :12/7/2004 4:08:23 PM Poster : brad stern

Thanks Matt.

Now all I need is custom fitness functions Big priority for me. Thanks steve for considering this

**Re: We need an Objective Function that considers intratrade drawdowns**

Date :12/6/2004 1:50:21 PM Poster : Ward.net Webmaster We're certainly willing to entertain more objective functions, but we actually already have a function that considers intra-trade drawdown. It is:

MaximizeReturnOnAccount\*EquityCurveCorrelation

If you take a look at an equity curve you will see that it does change intra-trade. Many traders consider a smooth but rising equity curve to represent an optimum system. Our goal with this function was to duplicate what what we felt most traders look for anyway.

### **Fuzzy patterns and Markov Models**

Date :12/11/2004 5:18:19 AM Poster : Phil Greenwood I've recently started exploring Markov Models for pattern recognition, and before starting to taking the plunge and committing lots more time to research (and possibly add-on development), I'm interested in finding out how similar these are with the existing fuzzy pattern add-ons. Markov Models are used extensively in speech recognition applications, whose time series data are similar in many ways to financial data; patterns may have variable lengths, numbers of segments, amplitudes, noise, segment curves etc. Furthermore, the need for speed is high in speech recognition. My research stems from a concern that I have with the Fuzzy Pattern add-on, which is that it doesn't allow for time distortion of the pattern...The fuzzy patterns in the add-on have a single setting for segment size - leading to the same number of bars per segment of the pattern. This seems to me to be a weakness, but perhaps this is an intentional design decision, but I would be interested in understanding more about how this decision was made and its rationale... Thanks for any insight you can provide, Phil Greenwood

### **Re: Fuzzy patterns and Markov Models**

Date :12/12/2004 7:40:47 AM Poster : Steve Ward

You can always put more flexibility or features in an add-on, especially when you are breaking new technical ground as we have done so many times. We could have also allowed more segments or more than five slope levels. The question becomes when does the additional complexity increase the likelihood of overfitting? What new features increase the confusion for users without corresponding increase in the probability of better models going forward? For example, instead of a longer segment in the midst of shorter ones, would two adjacent short segments both with the same slope level produce results almost as good? At what point is more juice not worth the squeeze? It's hard to know, so you just stop where it feels right. You can always add more later if you become convinced it's needed.

### **Training and Optimizing times**

Date :12/16/2004 4:27:45 AM Poster : Spyros Constantinides

Dear Steve Ward, Well done for a nice product, generally I am happy with neuroshell but I think it needs major improvement. My models finish training and optimizing roughly in 5 minutes, which I find, unacceptably quick. By definition neural networks and genetic algorithms don't find the best solution but try to come close. So I think the accuracy would improve a lot if the training and optimizing took for example 10 hours. I use daily data. I feel no matter how good neuroshell is I don't think it can find the best model so quickly. I have experimented with all the functions in the program. Is it possible to modify my product for extended training and optimizing? Will you have this feature in new updates?

### **Re: Training and Optimizing times**

Date :12/16/2004 11:06:35 AM Poster : Steve Ward

You'll be glad to know we already have the ability to set the time that optimization takes place. You can shorten it or lengthen it. You can make it 10 hours if you want. You may not have seen it because you may not have turned on all your

options yet. Turn them on and then look at the optimization tab. In addition, if you set your neural nets to 80 hidden neurons, they will train even longer because you'll get tighter fits. But for the record, we disagree with the premise that longer is better. Often longer means overfitting. The other thing you have to understand is that you are not dealing with backprop nets, which have a crude and therefore slow training method. If you have used backprop nets before, forget everything you learned and start over - these nets are different!

**Re: Training and Optimizing times**

Date :12/21/2004 5:19:54 AM Poster : Phil Greenwood

Spyros's message got me thinking: How are the estimates of training and optimizing times calculated? I'm doing an optimization at the moment that it started off estimating to take 6 hours, and it is now estimating three days and change - and it's been running all night. (It's a research oriented, "outcome agnostic" test, rather than a conventional trading system optimization, so the long run is OK).

This behaviour isn't unexpected because some of my parameters turn other parameters on and off, but I'm curious about how I should allow it to set my expectations - presumably in this case it's feasible it could be ready for Valentine's day... or maybe if I'm lucky I get an early Christmas present!

And also, how does the GA / Neural Net know when it's done? I don't recall ever setting such a criteria!

Phil

**Re: Training and Optimizing times**

Date :1/12/2005 5:19:50 PM Poster : Steve Ward

GAs never know when they are done, because there is no way to know if the "best" solution has been found already or not. You can only decide if the current best is good enough, or if finding better solutions is getting harder. Our GA algorithm just stops if a better solution hasn't been found in so many generations (there's an internal algorithm that estimates that.) That's why we added the ability for you to make it go more or less time. By the way, trailing and other stops greatly increase the time to optimize, because backtesting them is soooo much slower. Anything that estimates 3 days either has stops, or is way too complicated in my opinion. There's a nice tip explaining that called "When optimization is really slow".

**Signal and Noise step request**

Date :1/17/2005 6:14:53 PM Poster : Sunny I have lately been trying without any success to use NeuroShell DT to separate noise and signal. I was wondering if anyone who has already done this would mind telling me what tools and steps to follow in order to achieve this. What inputs should I be using? What should be the objective function? Regards, Sunny

**Re: Signal and Noise step request**

Date :1/18/2005 11:49:08 AM Poster : Sunny In particular, I am intersted in using wavelets and Fourier transforms.

### **Re: Signal and Noise step request**

Date :1/18/2005 4:13:52 PM Poster : Bertrand Hey Sunny, if you can outline a bit more what project you are trying to accomplish, there can be more specified recommendations. I had very good success for my applications with the Trader; I use Jurik's MA (& also others) very often to noisefilter all in & outputs before feeding them into any net. This usually stabilizes the net & reduces the forecast error... Inputs & objective functions can be the most important thing, so without knowing some more details I think generalizations may only do you worse. Let me also add that I've had more success with pattern recognition than pure "forecasting" of some time series. Best of luck, Bertrand

### **Re: Signal and Noise step request**

Date :1/19/2005 2:55:18 PM Poster : Sunny Bertrand, Thank you for your reply. I am trying to learn how to use wavelets and fourier transformations to separate noise and signal. This was my original post; however, I forgot to mention the technique I wanted to use to accomplish this. Silly me. :) On a different subject, I saw that you are using Jurik's tools. Have you used the DDR and WAV tools? What is your experience with them, and how do you use them? I tried using the DDR; however, I have been having some problems with its use. It is not meeting my needs or expectations. It will only take a limited number of inputs at once. WAV I have tried using it in a cascading forecast chart at the first cascade level, but because it will only take one input at a time, I am using it together with other indicators at this first stage. I was able to decrease the overall training average error of the prediction, but not by much. This indicator also did not meet my needs or expectations. In addition, to this I have been trying the checkbox that is supposed to balance the prediction with equal positive and negative inputs. Have you used this checkbox? What is your experience with it? The checkbox is located under the training tab in prediction parameters. It is supposed to adjust the training set for trending markets by evenly distributing training bars. It seems to lower my number of winners - losers, it lowers my percentage of correct signs; however, it increases the ratio of gross profit/loss, and it increases the ratio of avg. win/avg loss, and to be honest I am puzzled by this. Overall, I would say that in the final cascade effect the annual return increases. The whole thing seems counter-intuitive, but it seems to be sort of a trade-off. Regards, Sunny

### **Re: Signal and Noise step request**

Date :1/19/2005 7:36:57 PM Poster : Philippe Lonjoux Sunny, Fourier analysis breaks down the price into constituent sinusoids of different periods. I understand the usefulness of this technique when the signal's frequency content is stationary. However, financial time series may exhibit clusters of volatility and non-Gaussian behavior in price jumps making them non-stationary. Accordingly, FFT filtering may not fully capture these characteristics that make up most of the "knowledge" in the series. In an effort to correct this deficiency, a Short Time Fourier Transform (STFT) could be used by limiting the analysis window to a particular size. The series is then mapped into a two-dimensional function of time and frequency. However again, the window size cannot vary to determine more accurately either time or frequency.



Wavelet analysis, in contrast, uses approximating functions that are localized in both time and frequency space. It is the breaking up of the time series into shifted and scaled versions of an original mother wavelet that can capture some underlying processes (components) that drive the price. I have been somehow successful in using an undecimated Haar wavelet transform that I developed to build a multiscale-based strategy. You may want to use the WaveletFilterHaar Indicator and calculate the residuals to extract some useful components.

Philippe

**Re: Signal and Noise step request**

Date :1/20/2005 2:24:44 PM Poster : Sunny Philippe, Your answer crossed with another post I had just filed probably as you were filing this one. I agree on the part of stationary data, and I appreciate the insight on the STFT. This part I did not know as I had been wondering if it could be used for financial data. In addition, I found out that, in particular, the probability distribution curve for the intra-day data is probably non-Gaussian according to some papers I read. Some of them remarked that a better approximation would be the Poisson distribution. With regards to wavelets, I am still trying to figure out how to use them from a practical point of view. If you would not mind sharing this with us, I would be very grateful. In NSDT there is a collection of wavelets grouped into three different parts: Coefficients Coefficients with sorting Filtering The wavelets with coefficients have the following parameters: window exponent wavelet number The wavelets with coefficient with sorting have the following parameters: window exponent sorted wavelet number Finally, the wavelets with filtering have the following parameters: window exponent percent threshold I am at a complete loss as to the proper usage of each of the three categories.

I have not yet been able to figure out when is it appropriate to use each of them. Moreover, I had as I mentioned earlier my original purpose is to attempt to separate noise and signal. How do you determine which of the three categories are presenting you with the signal, and how do you determine which of them present noise? Sorry, about all the detailed questions; however, I am still at the stage of trying to figure out both the theory and the application portion. I found the following site which contain some insight from a practical point of view: <http://strule.cs.qub.ac.uk/~fmurtagh/result.html> They mention the use of the Haar à trous wavelet transform. My understanding is that the wavelets in Advanced Indicator Set 2 are also this same kind of wavelet. Apparently, the advantage of this type of wavelet is that it does not interfere with the last data point A more theoretical document on the same would be the following: [www.unige.ch/fapse/PSY/persons/prof-ana/renaud/papers/NeuroWavelet.pdf](http://www.unige.ch/fapse/PSY/persons/prof-ana/renaud/papers/NeuroWavelet.pdf) According to them the Haar à trous wavelet transform is non-decimated.

So I am assuming that the Haar à trous wavelet transform in the Advanced Indicator Set 2 meets the description of this paper, but perhaps we could get some confirmation of someone who has worked with it. Regards and thanks in advance, Sunny

**Re: Signal and Noise step request**

Date :1/21/2005 1:50:47 PM Poster : Philippe Lonjoux Sunny, Here is a link on a wavelet transform for filtering financial data streams. The paper describes a time-based and redundant Haar a trous wavelet transform that you could use within a Multiscale Entropy Filtering scheme. That should give you some elements as to extract noise from signal.

<http://strule.cs.qub.ac.uk/~gzheng/financial-engineering/finpapermay99.html>

"Apparently, the advantage of this type of wavelet is that it does not interfere with the last data point" This is true since the Haar transform is causal (it uses past data only to nowcast). But it comes at the price of a lag which is common to any MA indicators. Usually, neural nets make up for this lag by gaining in generalization. You can get around this issue anyway, not having any lag and preserving the predictive skills of the transform. Check this paper on Anna Goldenberg's Home Page: "Time series forecasting using wavelets with predictor-corrector boundary treatment

<http://www-2.cs.cmu.edu/~anya/> Hope this helps Philippe

**Re: Signal and Noise step request**

Date :1/23/2005 4:19:22 PM Poster : Sunny Philippe, Thank you for your response and your comments. The first paper had crossed my path; however, as they mentioned in the paper "Choosing the numbers of input and hidden units is something of a black art,..." I would extend this in my case for the usage of the wavelets themselves. :) The second paper seems to be unavailable in the internet. I will keep you informed if I happen to make any progress with this. Regards,

Sunny

**Re: Signal and Noise step request**

Date :1/24/2005 7:53:42 PM Poster : John Gotwals

You might want to consider the WaveFin add-on to NeuroShell. This package consists of Morlet wavelet and Gabor filters and includes a 73 page primer titled "Signal Processing for Financial Series". I have not had any experience with this package. See <http://www.neuroshell.com/addons.asp?wavefin>

**Re: Signal and Noise step request**

Date :1/20/2005 4:46:38 AM Poster : Phil Greenwood A couple of observations: You could do worse than explore John Ehlers' insights about using Hilbert transforms vs. Fourier transforms. His web site goes into this issue at [www.mesasoftware.com](http://www.mesasoftware.com). His point is simply that Hilbert transforms are quicker (require less data to come to an answer) than Fourier transforms. Also in his books, Ehlers goes into some depth about filtering techniques...the great thing about his approach is that he doesn't hide anything - it's all there in his books, from theory to including code. Of course rather than converting the code, you'll probably prefer to buy the NS add-on. And a traditional approach is to use a moving average...and there are many you can choose from from the "800+ indicators". I must stop sounding like a salesman... Of course there's no universal answer to noise elimination - one theory says that you shouldn't allow the concept of noise, that it's just signal you don't understand! Personally I think it's a useful abstraction. I know nothing about wavelets, so I can't help there. Cheers, Phil

**Re: Signal and Noise step request**

Date :1/20/2005 1:35:20 PM Poster : Sunny Phil, Thank you for the insight about the Hilbert transforms. I have the Cybernetic add-on; however, I could not find any Hilbert transforms there. Did you build your own Hilbert transforms? Regards, Sunny

**Re: Signal and Noise step request**

Date :1/24/2005 3:24:33 AM Poster : Phil Greenwood Sunny, I'm travelling at the moment, but I'll be home in a few days when I can check the books. Here's what I think you're looking for: Chapter 9\_period: This is the period of the dominant cycle which =  $1/\text{frequency}$ . I suspect this is the Hilbert transform by another name. Chapter11\_sine: This is the sine of the phase angle of the dominant cycle. So the InvSin of this should get you the phase angle. His books make these very transparent (though they are quite expensive). I'm pretty sure that the Hilbert transform is presented in both "Rocket Science" and "Cyberntic Analysis". Phil

**Re: Signal and Noise step request**

Date :1/25/2005 7:57:35 PM Poster : Sunny Phil, I will take a look at "Cybernetic Analysis." Regards, Sunny On 1/24/2005 3:24:33 AM Phil Greenwood wrote: Sunny, I'm travelling at the moment, but I'll be home in a few days when I can check the books. Here's what I think you're looking for: Chapter 9\_period: This is the period of the dominant cycle which =  $1/\text{frequency}$ . I suspect this is the Hilbert transform by another name. Chapter11\_sine: This is the sine of the phase angle of the dominant cycle. So the InvSin of this should get you the phase angle. His books make these very transparent (though they are quite expensive). I'm pretty sure that the Hilbert transform is presented in both "Rocket Science" and "Cyberntic Analysis". Phil

### **Challenge for programmers**

Date :1/19/2005 8:10:39 PM Poster : Sunny To everyone: I am not a programmer; however, there is a big gap in NeuroShell with regards to having a standard for inputs. For instance, I think that everyone agrees that normalizing, N, and detrending, D, the data provides in many cases better results as compared to using raw data. However, there is a catch. In order to process the raw data through this technique N&D it has to be entered by hand. This mean every high, low, close, open, and volume field has to be entered manually for every choice of N & D. I have a better idea why couldn't NeuroShell, NS, do this for us. I would like an initial module that allows the user to choose the data from several different categories, and then NS would spend some time determining which combination of N & D (NS would have a predefined set of N & D formulas to choose from) would provide the smallest error or the highest R-squared or some other statistical measure with regards to a set of indicators (a second set, defined by the user) which could be used for predicting a future value. No optimization would exist at this stage. This would simply be a quick and dirty set of tests to begin the real work. However, I believe that the time spent at this stage could determine from early on the success or failure of a given strategy. The advantage of this work is that we would get the following: 1- normalization of the data 2- detrending of the data 3- a match between inputs and a variable to predict 4- a considerable savings in time 5- more robust models With something like this almost everyone using NS would have at least one or two great predictions with which to work from. So my challenge is the following: Is there someone with sufficient programming skills willing to undertake such a project? I would like to hear from everybody. Perhaps there is someone with a different approach, a different idea, or perhaps a solution. Regards, Sunny

### **Re: Challenge for programmers**

Date :1/23/2005 2:37:10 PM Poster : Maciej  
Sunny,

It's not in NSDT but by combining Jurik's dlls and optionally with the Bowfort templates you can do some of what you are searching for. Look at the DDR among others. This is essentially a two step process so essentially for day data. It should help you eliminate inputs that are not useful. I tend to agree with you that this type of ability to improve the inputs would be a useful enhancement to NSDT. Who knows perhaps Steve Ward will take up this challenge.

### **Re: Challenge for programmers**

Date :1/25/2005 7:50:17 PM Poster : Sunny Maciej, Thanks for the idea.

I will try your two step idea. Perhaps you are right, and we can get Steve onboard.  
Regards, Sunny

### **Normalizing other instrument data**

Date :1/20/2005 4:51:48 AM Poster : Phil Greenwood If you're using other instrument data as an input to a neural net, is it possible (or necessary/advisable) to normalize it?  
Thanks, Phil

### **Re: Normalizing other instrument data**

Date :1/20/2005 9:48:44 AM Poster : Steve Ward

All inputs to all of our nets except the addon Adaptive Net Indicators (ANI) are normalized with respect to each other within the nets already. If you want to do more, it probably won't hurt anything, but I doubt it will help much. None of the nets normalize inputs or outputs with respect to time, which is why it is important to use indicators or use change/percent change instead of raw prices. The only time you might get away with raw prices is when the history was basically at the same price level.

### **Re: Normalizing other instrument data**

Date :1/21/2005 9:33:48 AM Poster : Kermit Hi Steve, Is there any way to remove a seasonal tendency from data, or have you given any thought to how this might be done? The method I use is to export the data to a spreadsheet, remove the long term trend (not always easy), and then remove the seasonal as best I can. I am looking for deviations from what should be expected seasonally. Kermit PS - Tell Andre that I love the Hodrick-Prescott filter that he programmed when doing things like this.

### **Re: Normalizing other instrument data**

Date :1/24/2005 3:28:18 AM Poster : Phil Greenwood So if I'm using a price time series as another input to a regular NeuroShell Turboprop neural net, is it advisable to input the log, or deviation from a long term average, of the price to normalize this data against time?

Phil

### **Re: Normalizing other instrument data**

Date :1/24/2005 8:37:41 AM Poster : Steve Ward The log doesn't really do the trick. However, the deviation from an average or an index is certainly a good way to go. Percent deviation will be much better.

### **Re: Normalizing other instrument data**

Date :1/24/2005 5:00:10 PM Poster : Steve Eberbach

I like to use the differences of the logs from one time sample to the next:  $100 * (\ln(\text{data}[0]) - \ln(\text{data}[-1]))$ . Also you can modify the usual percent change by substituting a two point average of the two data points instead of just the latest data point as the basis for what the change is a percentage of.  $(2 * (\text{end start}) / (\text{end} + \text{start}))$ . The advantage of the first (change of logs times 100) is that 50 up means doubling, while 50 down means halving. Both have the desirable property that an average or cumulation of this type of "% change" will not acquire a "bias" or "offset" over time when there is no trend

in the original data series. Sometimes this gives better results over long time periods than the usual % change definition. The redefined percent change formula is almost equivalent to the first formula if the percent change is less than 5 %.

Another formula I use is, in NST formula language is:  $Mul2(Sub(Ln(Avg(Time Series, AvgPeriods)), Lag(Ln(Time Series), Periods Back)), 100)$

This is the difference between the log of an average and the log of a lagged data point times 100. This is a good target to predict into the future. If the lag is zero, it makes a great normalizer of current data. It also has the benefit of no cumulative bias for a sequence of halvings and doublings, but no trend in the original data series. It also means that the size of the short term wiggles does not change the slope of a long term trend in your normalized data. It will not distort the slopes of your regression lines. It is more meaningful when your data is volatile.

**Re: Normalizing other instrument data**

Date :1/25/2005 7:47:50 PM Poster : Sunny

Steve Eberbach, You are great. :) I tried your difference of logs, and I got great results. Perhaps you would not mind replying with an exact NS formula for your ideas ( counted 3 so far). If you are ever interested in giving a short course on using NS, you can count me in. Regards, Sunny

**Re: Normalizing other instrument data**

Date :1/24/2005 5:22:30 PM Poster : Steve Eberbach

Correction: In my last post I forgot to multiply the second formula by one hundred to get percentage points instead of decimal fraction. The multiplier should be 200, not just 2.

### **Fourier Transform indicator**

Date :1/20/2005 5:39:45 AM Poster : Sunny Does anyone know whether the Fourier Transform indicators included in NeuroShell are the normal Fourier Transform or the Short-Term Fourier Transform? Why? To begin, I read several posts of people trying to use them; however, some of them had problems with their use. After reseraching a little bit, I found the following (ideas below belong to Robbi Polikar): The Fourier Transform is not a suitable tool for analyzing non-stationary signals, signals whose frequency constantly changes in time. We can obtain the frequency components of the signals; however, we cannot obtain the times when the frequency components occur. The Short-Term Fourier Transform, on the other hand, is a function of both time and frequency (unlike FT, which is a function of frequency only). For a complete version of these idea you may go see them at the following address:  
<http://users.rowan.edu/~polikar/WAVELETS/WTpart2.html>

### **Re: Fourier Transform indicator**

Date :1/24/2005 3:06:05 AM Poster : Phil Greenwood Looking at your reference, the author seems to make a pretty compelling case for using Wavelet transforms rather than FFTs...read further, parts 3 and 4. Phil

### **Re: Fourier Transform indicator**

Date :1/25/2005 8:01:52 PM Poster : Sunny Phil, You are right.:) You might want to look at my post of the 18th. I have been looking at wavelets as a possible solution. My biggest problem is how to use them. I have located thanks to Phillipe some possible ideas to pursue; however, I am at the very early stages. Regards, Sunny

**What is the difference between the Fuzzy Sets and Fuzzy Pattern Recognizer Add-on?**

Date :2/13/2005 9:23:08 PM Poster : George  
Neuroshell website says:

"The new Fuzzy Sets add-on is somewhat different in that it allows users to describe a combination of values of traditional indicators with fuzzy logic". that means you cannot use indicators in the Fuzzy Pattern Recognizer ? only prices...? If somebody would be able to explain to me the differences and in which way these two add-ons overlap that would be great.

**Re: What is the difference between the Fuzzy Sets and Fuzzy Pattern Recognizer Add-on?**

Date :2/14/2005 10:27:39 AM Poster : Ward.net Webmaster No, you can apply Fuzzy Pattern Recognizer (FPR) to indicators just as Fuzzy Sets (FS) does. The best way we have thought of to describe the differences is this: Think of the FPR as looking at a time series and evaluating movement of that series over recent time. Think of FS as looking at discrete values in time and evaluating those values with respect to a historical range of those values. E.g.: FPR - the time series went up, then down, then down sharply. FS - the time series is very high compared to how it has been over a long period of time.

If that doesn't help, please ask more questions.



### **Interesting results - pass on technique**

Date :3/3/2005 2:03:10 PM Poster : Mark B.

Hi, I got some unexpected results - great results - with a so so trading strategy and got to thinkin' maybe the Neuroshell "Family" might like to know about it. You either let the GA do it's thing or, as in my case, force the GA into directions it would not normally take in an effort to find unexpected results. (I would sure like a brute force optimizer option outputed to a file that can be loaded in Excel.) First, I begin by optimizing on "Max Return on Account" (default) and set longest trade to 25 bars. Plus I set "Paper Trading" to 1 year. I want 70 Percent or more profitable trades.

After the less than great results were produced I went back to: Costs >Margin%per share and set it at 500%. Just screwin' around. Ran the strategy and let the GA do it's thing. Got really, really bad results. Really bad percent of profitable trades and a low return.

I then went back to Costs ----->Margin% per share and clicked it off. Rerun the strategy and Picked Yes to use the same optimal settings. Then clicked on "Stop Optimizing" and the results were Great! That the short version.

In long version I stepped back the Margin% by 100% --- 500% than 400% than 300%.....

Each time checking the results.

I hope you find this helpful.

Mark

### **Re: Interesting results - pass on technique**

Date :3/9/2005 11:26:46 AM Poster : Steve Eberbach This is quite interesting to me. I believe that with such low transaction costs these days, the Time Value of Money cost is becoming the most important cost of being in a trade.

I think that setting the interest rate on margin higher should do a similar thing for you, since the Genetic algorithm would have to also consider the time cost more in addition to the transaction and slippage cost. More value would be placed on "stepping aside", which would also reduce exposure to unexpected-event drawdowns, even if total profit was caused to drop a little, compared to being always in the market.

I have a question for Ward Systems: What IS the interest rate on the margin when you are in the trade? I do not see any entry on the costs dialog for setting that cost for borrowing the margin money in percent per year. Could you add a setting to adjust this cost of margin money while you are invested in a trade? (either long or short). Thanks!

### **Pattern Recognition**

Date :4/23/2005 4:17:39 PM Poster : aaapers

Since Steve Ward suggested that we ask for assistance for NST add-ons, I am would like to bring up a an issue regarding the pattern Recognition add-on. I have seen other commercial programs refer to their ability to use Elliot Wave concepts in trading. One program in particular uses the ABC preliminary wave patterns to project entry and exit points. On the surface it would appear that the pattern recognition add-on should easily accomplish the same goal and more. However, in practice I have not been able to do so. Part of the problem is the way the add-on is structured to respond to rises and falls only. However, there are other variables that are required to identify a Elliott Wave initial pattern. For instance in a three segment pattern, segment 2 should not exceed the length of segment 1. Segment 2 should also not extend below the origin of segment 1 if the pattern is an upward moving pattern. As the add-on is structured, I know of no way to acheive this level of recognition. Certainly if there were other programming variables added which would allow for more constraints, this ABC pattern and multiple other patterns would be possible. If someone has a work around for this problem, I would be very happy to hear about it. Tx AI

### **Re: Pattern Recognition**

Date :4/25/2005 9:32:42 AM Poster : Steve Ward

Those other constraints you want are probably not hard with the usual NeuroShell indicators.

I think I would approach this pattern recognition problem not with the Fuzzy Pattern Recognizer (FPR), but with the Fuzzy Sets (FS) addon. Think of the latter as the building blocks of the former, even though that isn't how we built them. You make you segments first, either with momentum across several bars, or with the regression slope through several bars. That way, you can make the segments any size you want. Use the save indicators feature with parameters hidden from user if you don't want the optimizer messing with segment sizes later (although you may not want to use the optimizer at all). Use FS to get these segments going in the directions you desire -fuzzily. Since you made the segments yourself, you can do various tests on them, like segment 2 not below segment 1, with the regular NeuroShell indicators.

I suppose you could also use FPR if you let if find the segments first, then use the regular indicators to do other tests. But using FS you will probably have more control.

### **Re: Pattern Recognition**

Date :4/26/2005 1:28:57 AM Poster : aaapers

Thanks Steve! It sounds like a good idea and I have already started working on it. Tx AI On 4/25/2005 9:32:42 AM Steve Ward wrote: Those other constraints you want are probably not hard with the usual NeuroShell indicators.

I think I would approach this pattern recognition problem not with the Fuzzy Pattern Recognizer (FPR), but with the Fuzzy Sets (FS) addon. Think of the latter as the building blocks of the former, even though that isn't how we built them. You make you segments first, either with momentum across several bars, or with the regression slope through several bars. That way, you can make the segments any size you want. Use the save indicators feature with parameters hidden from user if you don't want the optimizer messing with segment sizes

later (although you may not want to use the optimizer at all). Use FS to get these segments going in the directions you desire fuzzily. Since you made the segments yourself, you can do various tests on them, like segment 2 not below segment 1, with the regular NeuroShell indicators.

I suppose you could also use FPR if you let it find the segments first, then use the regular indicators to do other tests. But using FS you will probably have more control.

**Next Day High, Low, Close prediction**

Date :5/17/2005 11:44:42 AM Poster : EllisWyatt

Hello all.

What is a good way to construct a Next Day High, Low, Close prediction for, say, EUR/USD in the forex market?

Anyone done this or something similar?

**Re: Next Day High, Low, Close prediction**

Date :5/24/2005 8:30:12 AM Poster : Matt Jarvis

IMHO the key is to make sure you are using inputs that exist when you want to trade. Seems obvious but it fooled me for a while. If you are only trading during the day, you can use stock indexes and related. If you are trading around the clock, then try indicators based off other currency pairs.

### **Empiric Selection Criteria**

Date :6/19/2005 8:38:17 AM Poster : Marcel Hi, I've been developing and practicing very intensively with NST Pro for the last 3-4 months, working 15h a day including weekends; I've built a few dozens of models, screened and tested almost a thousand of stocks with them, and finally selected 30 that I'm now actively trading with a handful of models. Besides a few lucky trades, I'm however not yet satisfied with my results – the winners/losers ratio of the traded stocks is 30-40%, while I was expecting it to be at least above 50%. At this point in time there is one important question that bothers me – What are the criteria that qualifies a stock/model for trading? Analyzing charts, plotting meaningful indicators, building models based on NNs, testing, backtesting etc. are all necessary steps, results of which are in the end proven with good/positive Out of Sample statistics. For example, I set my criteria to >70% successful trades, double performance than buy & hold but at least 30% on a yearly basis, and last but not least a visually attractive chart with the buy/sell signals placed at the right turning points and no major mistrades or periods of inactivity in the Out of Sample chart. I'm aware about the risks of overfitting, therefore I make only little usage of optimization, limit the amount of EoD data to 4-5 years and usually define a few walk-forward test periods of 6 months. Now back to my original question:

- . On the basis of which empirical criteria do you qualify for trading a stock/model that performs well during the Out of Sample period?

- . What gives you the certitude that the stock/model will in reality perform nearly as good as during the Out of Sample period, at least for a few months, after which retraining will probably be required?

- . What do you do to ascertain and limit the risk that a stock/model does not “go crazy” once trading has begun and totally misbehave?

- . Is there any documentation on this subject? I appreciate all objective and founded comments on the above. Thanks in advance,

Marcel

### **Re: Empiric Selection Criteria**

Date :6/20/2005 2:40:43 PM Poster : josh Marcel:

I love hearing about people putting in extraordinary hours in pursuit of their goals. I've recently returned to NST Pro after an extended break because my own intuitive trading has turned . . . ahem . . . unprofitable.

Never having visited before, I came to this forum a couple of days ago and began reading the threads chronologically from Steve Ward's welcome comment in 2000. Skipping only the thread titles regarding data vendor issues, I've read about a year's worth (extremely slow . . . reader). I can't recommend this enough! It takes a while, but the folks at WSG and NST users have done a tremendous amount of work addressing these and many more issues. I remember reading frequent references to this forum in the documentation, but never resolved to simply start reading it (rather than searching it for a specific answer).

I am less experienced with the product than you are, and I may have misunderstood your questions, but I am confident you would be well served by undertaking to just start reading this forum from the beginning. Again, if you have already done that, I apologize. You will come across posts from users that may not

have the exact same question as yours, but who approach trading in a very similar way, and their discussions will be especially useful in expanding your perspective. On more than one occasion, a user noted that if the forum had been created a year earlier, they would have saved months and months of working in unproductive directions. The same must be true of us (not you, necessarily, but me . . . and whoever else neglects this amazing resource).

As to your specific questions, sorry to blow you off like this, but I really feel qualified only to relay my good fortune at having come across your answers below. I'm going to follow up this post by reviewing what I've read of the forum so I can make specific thread suggestions. I would attempt to answer you more directly, but I'm so new, I feel like the proverbial mortal before giants here.

Josh

### **Re: Empiric Selection Criteria**

Date :6/22/2005 11:43:25 AM Poster : Marcel Josh, Many thanks for your valuable input. Don't underestimate yourself, every answer, tip or comment can help myself or others. Sometimes it's exactly those simple things that provide the correct direction, which ultimately leads to resolutions. Wrt previous discussion threads, yes, I've read a few, but I definitely didn't have the patience to go through as many as you did. I've also found the discussion forum software to be a bit user unfriendly when you want to dig into past threads, but this can't be used as a pretext. I may have to take the time and dig into them, so far however I haven't found the answers I'm looking for. Marcel

### **a few good threads**

Date :6/20/2005 3:03:50 PM Poster : josh Marcel: Here are the threads that came to mind upon reading your questions. Seems like none ask your exact questions, but deal with similar issues. Listed according to how I perceive their relevance to you: "Before entering the market," posted by Jacobs, 11/28/2000 "General Advice . . .," posted by Ian, 9/7/2000 "What issue to pick," posted by Steve Ward, 10/26/2000 "Evaluate a model- me?," [lol] posted by Jacobs, late 2000 (forgot to jot date) And others! Hope this has been some help. Don't forget to take a break to eat and look outside. Good luck!  
Josh

### **Re: Empiric Selection Criteria**

Date :6/21/2005 3:16:38 PM Poster : Maxwell  
Craven Good advice from Josh. I don't think there's any way to have "certitude", but let me ask -how many inputs did you use?

### **Re: Empiric Selection Criteria**

Date :6/22/2005 12:02:46 PM Poster : Marcel Maxwell, All the models I'm using for trading are conceptually similar, i.e. enhanced versions of one of the examples provided on the CD (I think it's Example 6). I have 3 NNs that independently deliver signals to a trading strategy, which ultimately decides whether to go short/long. No

model has the same set of NNs. In one model the 3 NNs take input from different categories of indicators, while in another the 3 NNs use the same indicators, but set in such way that they consider different timings (short/medium/long term). To answer your questions, the inputs per NN vary from 3 to 6. Marcel

#### **Re: Empiric Selection Criteria**

Date :6/23/2005 3:56:49 PM Poster : Maxwell Craven That doesn't sound like too many inputs. What time frame are you using for training? Does the market exhibit strong moves in both directions during this time frame? What objective function are you using? On 6/22/2005 12:02:46 PM Marcel wrote: Maxwell, All the models I'm using for trading are conceptually similar, i.e. enhanced versions of one of the examples provided on the CD (I think it's Example 6). I have 3 NNs that independently deliver signals to a trading strategy, which ultimately decides whether to go short/long. No model has the same set of NNs. In one model the 3 NNs take input from different categories of indicators, while in another the 3 NNs use the same indicators, but set in such way that they consider different timings (short/medium/long term). To answer your questions, the inputs per NN vary from 3 to 6. Marcel

#### **Re: Empiric Selection Criteria**

Date :6/27/2005 7:11:10 AM Poster : Marcel

Maxwell, As stated in my original message, the training is limited to 4-5 years and I usually define 2 walk-forward test periods of 6 months. Yes, it can happen that the price charts exhibit break-outs in both directions. I know that there is a practice of selecting only stocks that have recurring trend patterns. But instead of subjectively filter those out, I let the statistics tell me: Strong moves during the training phase will sensibly condition the nets,

and if those moves are not present anymore in the out of sample period, it will result in very few signals and usually bad relative performance. With regards to Objective Function, I've had the best results with "Maximize Return on Account". I do however sometimes also use "Maximize #Winners - #Losers". Marcel

#### **Re: Empiric Selection Criteria**

Date :6/27/2005 2:46:28 PM Poster : josh I would like to describe my thought process on the subject. Maybe you are way ahead of this, but here goes: First rule of trading/risk management/money management = Love Your Losers. Accept that there will be losers and develop a system that requires you to take them in proportion to total equity. The book "Market Wizards," my favorite industry book of all time, demonstrates over and over again that the discipline to take your losses is tops. Most of the traders interviewed set their max loss-per-trade to total equity ratio at between 2 - 5%. If you have \$100,000 equity, you risk no more than \$2,000 - \$5,000 on any trade. So I have been stabbing at a model that not only gets it right, but that limits the max drawdown. So I've had most luck with Limit Max Drawdown when plugging inputs into Prediction Wizard. Of course, when taking an indicator that has been vetted and optimized with the Prediction Wizard and used to build a Trading Strategy, I would never have thought you could have any confidence that your Strategy, using only the inputs given, would come up with entry and exit signals GUARANTEEING similar risk management characteristics to the

Predicted inputs. It is my belief that you have the option of putting an exit condition or a "reverse" condition, but you must enter a "stop" in order to guarantee loss limits. So far (and I am painfully new to this) entering these things has completely screwed the predicted pooch when I try to generate a decent Trading Strategy. I wonder if its possible to pass on these loss limit rules to the prediction wizard when you're looking for inputs in the first place? In other words, look for parameters that can allow max drawdown to float, and that understands that there must be a loss limit. This is a long post, so I'll post again when discussion runs to ratios of "evaluation bars" to "Out of sample bars." I have a theory for determining these I'd like to set up for debunking! Josh  
On 6/27/2005 7:11:10 AM Marcel wrote: Maxwell, As stated in my original message, the training is limited to 4-5 years and I usually define 2 walk-forward test periods of 6 months. Yes, it can happen that the price charts exhibit break-outs in both directions. I know that there is a practice of selecting only stocks that have recurring trend patterns. But instead of subjectively filter those out, I let the statistics tell me: Strong moves during the training phase will sensibly condition the nets, and if those moves are not present anymore in the out of sample period, it will result in very few signals and usually bad relative performance. With regards to Objective Function, I've had the best results with "Maximize Return on Account". I do however sometimes also use "Maximize #Winners - #Losers". Marcel

#### **Re: Empiric Selection Criteria**

Date :6/27/2005 5:23:11 PM Poster : Maciej

I don't think its possible to add stops and such like into the Prediction Wizard. The way I do it is to use one of the Neural Add-ons and use that in a trading strategy when on can use the stops.

#### **Re: Empiric Selection Criteria**

Date :6/29/2005 10:02:00 AM Poster : josh Maciej: 'I don't think its possible to add stops and such like into the Prediction Wizard.' Thanks for the reply. I meant to suggest that it would be nice if the Prediction Wizard could handle the concept of stops in a future release of NST. I feel like I'm missing a fundamental concept behind NST. 'The way I do it is to use one of the Neural Add-ons and use that in a trading strategy when on can use the stops.' I have toyed briefly with Neural Add-ons myself in the Trading Wizard (following the examples with recur and jump indicators), but I can't say as I truly understand what is happening. Would you mind giving me a rough idea how you put together a Trading Strategy with the inputs you like from the Prediction Wizard using Neural Add-ons, and being specific in how you specify exit and stop signals? -Josh

#### **Re: Empiric Selection Criteria**

Date :6/29/2005 12:39:27 PM Poster : Matt Jarvis

I use the add-ons too because they offer a lot of advantages. However, you can also stick a net made with the Prediction Wizard into a trading strategy, then add stops there.

#### **Re: Empiric Selection Criteria**

Date :7/7/2005 11:23:29 AM Poster : Marcel Josh, Thanks for your contribution. I've nothing to add on "Love Your Losers", that's key and goes along with the principle of



"Strictly following and applying discipline". I do also underwrite to the Risk Mgmt comments, although in this context I'd rather call it Money Mgmt. No strategy is efficient without a proper Money Mgmt umbrella. For this reason I've adopted the practice to set stop loss limits quite a while ago. My experience is that incorporating stop losses while building and training models and strategies is not effective, as you say it screws up the outcome. Depending on the model, sometimes you simply end up in having a number of little consequent losers instead of a bigger single draw down. Stop losses are however very efficient in the Money Mgmt context, as an overall strategy outside of NST, that's where in my opinion it has to be applied. Marcel

### **Re: Empiric Selection Criteria**

Date :6/27/2005 5:11:45 PM Poster : Maxwell Craven

I have two suggestions. First, try using another objective function. The one I like is return on account\*equity curve correlation, having become accustomed to it from something that I read here or in a discussion with someone at Ward Systems, I forget which. What you are looking for is a smoothly rising equity curve, not too steep, but gentle in nature, which might answer your original question. Second I read in one of your posts that you are using Jurik indicators, though I don't think you mentioned which ones. Be very careful with any type of moving averages, whether they are so called adaptive or not. Moving averages are like price, and thus not detrended. It is better to use spreads or percent spreads between moving averages, or other detrenders applied to them. If you are using moving averages by themselves in a neural network, future price levels essentially match up with smaller portions of the training set. Good luck.

### **Re: Empiric Selection Criteria**

Date :6/28/2005 10:50:35 AM Poster : Marcel Thanks Maxwell, I will try your suggestion re objective function in the new set of models due for next month. With regards to Jurik indicators, I avoid the direct usage of moving averages for the reasons you explained below. I make instead use of combinations of CFB, Polarized Fractal Efficiency, Speedy MACD, DMX and RSX - some of them with adaptive source. Marcel

### **Re: Empiric Selection Criteria**

Date :6/26/2005 4:11:53 PM Poster : Greg Kramer

Re: "- On the basis of which empirical criteria do you qualify for trading a stock/model that performs well during the Out of Sample period?" My acceptance criteria for a system tested with realistic commissions and slippage:

1. The out-of-sample equity curve moves from the lower left to the upper right hand corner of the chart without significant drawdowns.
2. Max Drawdown of less than 10-15% of the prior peak equity
3. Reasonable values for % Winning Trades and Profit Factors (these are

interdependent, so hard fixed numbers can't be given)

4. No significant clusters of alternating buy/sell's on consecutive bars (a major problem with NST if long/short signals are optimized independently, i.e., without all parameters linked).

Re: "- What gives you the certitude that the stock/model will in reality perform nearly as good as during the Out of Sample period, at least for a few months, after which retraining will probably be required?"

The purpose of the out-of-sample test is to give one confidence that the system may continue to perform well on unseen data. But there can be no guarantee that the system will continue to perform well. One can gain additional confidence by testing the system on other instruments/stocks to see how good the generalization is; but there again there is no guarantee on future performance.

Re: "- What do you do to ascertain and limit the risk that a stock/model does not "go crazy" once trading has begun and totally misbehave?"

1. Bet Sizing (money management).
2. Pre-established system termination criteria (e.g., equity curve going south over a given time period or max drawdown greater than X percent, etc.)

Re: "- Is there any documentation on this subject?"

Pardo, R., "Design, Testing, and Optimization of Trading Systems" Stridsman, T., "Trading Systems that Work" Stridsman, T., "Trading Systems and Money Management" Chande, T., "Beyond Technical Analysis"

### **Re: Empiric Selection Criteria**

Date :6/27/2005 10:44:44 AM Poster : Marcel Greg, Thanks very much for your substantial and valuable input -let's hope for some more to come. I can very well follow your acceptance criteria, interesting for me is your focus on drawdown (prior to performance), which contributes also to risk management. What raises some additional questions is the middle section: I agree that the Out of Sample period is there to ascertain the validity of the model.

. But what if you select out of a sample of 100 stocks, only the few ones that perform the best?

. Isn't this a kind of "manual fitting"?

. Or have you been able to create models that fulfill acceptance criteria for a large number of stocks?

Thanks also for the literature reference. Marcel

### **Re: Empiric Selection Criteria**

Date :6/28/2005 10:56:19 AM Poster : Greg Kramer

Re: "interesting for me is your focus on drawdown (prior to performance)" Actually, prior to looking at drawdown, the system must first have "good performance" which for me is equity moving from the lower left to upper right. This means that the system is capable of making money and has a positive expectancy.

Re: "But what if you select out of a sample of 100 stocks, only the few ones that perform the best?"

My purpose for out-of-sample testing of additional stocks is test the system with additional data that it has not seen before and to determine if it has generalized its rules or is curved fitted. If only a few of the 100 stocks perform well in an out-of-sample test, then the system has failed to generalize. In this case you may want to attempt to identify why (e.g., the stocks that do well are highly correlated with the stock(s) that you initially trained the system on, etc.).

Re: "Isn't this a kind of "manual fitting"?" Maybe. But remember that

- (1) The system performed well during training;
- (2) the system performed well on the initial out-of-sample test on the training instruments/stocks;
- (3) the purpose of additional out-of-sample testing on other instruments/stocks was to gain additional confidence and to determine how generalized (vs. curved fitted) the system is. I see no problem with trading the system on the original instruments/stocks. Of course one could paper trade the system in realtime for some period to gain additional confidence. But at some point you are going to have to belly up to the bar and place your bet with hard cold cash.

Re: "Or have you been able to create models that fulfill acceptance criteria for a large number of stocks?" Yes.

#### **Re: Empiric Selection Criteria**

Date :7/7/2005 2:02:17 PM Poster : Marcel Greg, Your reply makes me more and more curious... Re: "the system must first have "good performance" which for me is equity moving from the lower left to upper right" My understanding is that performance is measured either in \$ or %. I actually don't care if the equity has an upward or downward trend, since I trade both long and short. As long as the equity HAS a trend, and as long as this trend is successfully captured/learned by the model and eventually applied in the out-of-sample, for me what counts is the performance in \$/% and the ratio of mis-trades. Do I miss anything here? Maybe you are referring to e.g. a NetProfit or SystemEquity curve... Re: "If only a few of the 100 stocks perform well in an out-of-sample test, then the system has failed to generalize" I must admit that following the above, ALL my models are failing. If I take for example the Nasdaq 100 set of equities, I usually get only a few "good looking stocks", at best they are in the higher single digit. Considering a training span of 4-5 years, one also has to take into account that the number of stocks that have been following a "normal trend" during this time is very, very scarce. Most of the instruments have been going through the 2000 bubble, a big peak then the decline. Those which didn't were maybe commodity or energy related, and these have gone crazy lately peaking for the last 2 years. Re: "Or have you been able to create models that fulfill acceptance criteria for a large number of stocks? --> Yes." This really makes me curious! I'm a bit ashamed to ask this question, but would be willing to share your experience? Ideally, would you be willing to post a few examples (\*.cht files) based on current data? I've started another thread "Model Sharing", maybe you want to contribute there... Thanks a lot! Marcel

### **Model Sharing**

Date :6/27/2005 11:57:13 AM Poster : Marcel

I know that with this message I'm going to touch "sensitive ground", nevertheless I'm serious about it and wish to explore further.

I ask myself if there would be interest to share Models among members of this forum.

IMHO there are little reasons why not:

- . Most of us are using NST for personal rather than corporate interest
- . There is only limited IP to be "given away"
- . Experience is the essence here, not the results in form of models
- . It would be an additional advanced educational enrichment for all of us
- . It would help us to relatively compare the quality of our own models
- . And generate new idea and ground to work on

From my side I'm willing to share the models I'm trading with. Most of them make use of Jurik indicators, but these can easily be replaced by traditional indicators with some performance decrease to be expected. I'm using EoD data only, not sure if models can be used for Intraday too.

Your thoughts and comments are welcome. Marcel

### **Re: Model Sharing**

Date :6/27/2005 3:24:57 PM Poster : josh

Marcel-

I am interested in sharing. There is a quasi-precedent for this practice dating back to 2000-01 among individuals collaborating on a system. Wonder how they got along? Their posts were entertaining to read as they developed criteria for issue selection, objectives to predict, inputs they like, etc. If I had a profitable model I would share it in this post. Alas, I am not working on that skill set yet. Have you ever seen Karate Kid? I'm still at "wax on! wax off!" I.e. working on getting the Prediction Wizard to optimize my inputs and parameters to result in 5 out of 5 profitable walk forwards. Maybe I should ease up on my input criteria before trying to codify trading rules?

Some of the inputs I'm toying with are BBands, stochastics, old highs and lows, as well as Turning Point, Advanced Indicator Sets, Clusters and Fuzzies. In reality, I think there are more than enough indicators included in the program to keep someone new like myself busy for a year or two. I appreciate your suggestion to exclude add-on indicators in shared models.

You alluded to the school of thought that argues against sharing "the total package." (my term) I don't subscribe to that, but like you, I have the upmost respect for those who do. We all know how much work goes into a successful model (more than I've put in!). I simply don't think enough people could copy a strategy and implement a trading program based on it to significantly influence the S/D of highly liquid stocks before the market changes of its own volition rendering the strategy obsolete anyway. So, for me, sharing is merely akin to fleshing out the excellent examples included in the software-something I hope to do for as long as I'm using this product. For others, it may seem like shooting themselves in the foot.

Josh

**Re: Model Sharing**

Date :6/27/2005 5:17:47 PM Poster : Maciej

I can understand people's reluctance to share models particularly as most of these systems represent considerable effort which no one wants to give away. The reality is that its most unlikely that any two of us will trade a given system in exactly the same way unless it were totally mechanised including the trigger pulling part. An example in the public domain is the turtle trading system - we all know how it works but few of us have the account size or temperament to trade it.

**Re: Model Sharing**

Date :6/29/2005 9:45:33 AM Poster : josh

'I can understand people's reluctance to . . .'

Agreed.

'An example in the public domain is the turtle trading system . . .'

You may be interested in this. I bought the turtle program a few years ago. In it they extolled the virtues of the trend trading philosophy: citing statistics on trending vs. non-trending periods, the phenomenon of trends showing up in coin

flips, etc. (I haven't plugged it into trading system software to test it because I've never learned how to account for changing position size.) But anecdotal evidence suggests those using the system suffered a period back then that wiped many out. Perhaps because there were so many users? I don't know the answer to that. The futures markets entered a non-trending period of sustained duration to the extent that Richard Dennis closed up shop. (He may have reopened as the markets have been looking more trendy in the last year or so) My gut is that the turtles brought attention to the overall phenomenon of trend following because it was such an easy idea to understand, and that successful models developed with much help from NST would hinge on theories less easily articulated and therefore not mass distributed.

I'm sure you didn't mean it this way, but just to clarify, the Turtle system is not in the public domain, although it might as well be, as you said, "we all know how it works." Finally, wouldn't it be cool to arrive at a new theory, as easy to understand as "trend following," that revolutionized the risk-management industry? Talking about this makes me want to re-read "The New Market Wizards," almost as good as the first one, but seems more focused on systems traders. Reading that series always gets me pumped.

Josh

**Re: Model Sharing**

Date :6/30/2005 9:59:14 AM Poster : Steve Eberbach

Funny thing, this Synchronicity!

I also am reading "The New Market Wizards", and am getting very pumped. Trading is so complex that it is very difficult for a single person to "do it all" themselves. It takes a team of people with various talents working together with psychological diversity and checks and balances, unless you are one of those "multi" types with perfectly disciplined ADHD.

I am grateful to have Steve Ward and Co. on my little team.

You no longer have to buy the original Turtles' strategy to learn it. Have even been modelling the "Turtle system", which you can read about at:

<http://www.originalturtles.org/system.htm>

The tough part is the putting-on-positions rules requiring a time/price-diversified staged entry and exit strategy, but it is key, mathematically, to the success, which I have verified to my own satisfaction with NST, using overlaid strategies. (See tips) I have only verified some of the principles involved with "Turtle-like" models.

The real thing is really much more difficult to model and execute than the more typical signal-and-threshold paradigm, but a breakout stop-order Template (in trading strategy wizard) which is [almost] always trying to enter the market OPPOSITE the current position with stop orders is my starting point. The simplest stops are  $\text{Lag}(\text{Max}(\text{PriceTimeSeries}), \text{spanbars})\text{lagbars}$  and  $\text{Lag}(\text{Min}(\text{PriceTimeSeries}), \text{spanbars})\text{lagbars}$ . Just like the original Turtles' "Breakouts". Layer on more copies of basic strategy with stops offset in price to simulate staged entries, exits, reversals. You have to begin by assuming you will Timing-diversify using several contracts, or "lots" of

stock shares.

Also key to success is being able to diversify among instruments of trading, because nothing trends all the time, let alone trends all the time in just one direction. It is analogous to catching popcorn just as it is popping. Focussing on each popping kernel one at a time is a frustrating exercise at best.

Steve

**Re: Model Sharing**

Date :7/1/2005 12:26:53 PM Poster : josh Thanks, Steve. ". . . but a breakout stop-order Template (in trading strategy wizard) . . . is my starting point." That is a fascinating concept. But- and don't take this the wrong way- by any chance did you arrive at that strategy after repeated attempts to develop a \*successful\* trading system resulted in developing a wonderfully consistent \*losing\* trading system? A.k.a. The Un-Holy Grail? The Anti-Grail? I ask because I think I'm closer to cracking that mystery than I am to a decent model. The thought has occurred to me at times that I should be able to safely take the opposite positions of my strategy's signals and do quite well. If I understand you correctly, your model has the following characteristics: it relies on "sub-models" for entry conditions sub-models take the theories of the turtle system (based primarily on the identification of trends) and creates simple entry signals and stops. the trading model takes the sub-models' stop signals for it's entry signals you use portfolios of trading models to diversify among issues and time frames Can't an entry signal using another model's stop signal be instead positively identified with an indicator? Is it easier for one to generate the multiple layer models (for a variety of issues)-- necessary to diversify across time-- by beginning with a first model that generates stop signals? As you diversify across time, is it your hope/expectation that, although you may lose one or two or five in a row, ultimately you will have a bunch of individually deployed signals ganging up on a trend? "The simplest stops are . . ." Oy, yay! As I've stated recently, I'm still a newbie here, so maybe when I butted in asking for specifics, I stepped in it. I still have some larger issues I need to arrive at on my own through trial and error screwing around. I really appreciate your willingness to lay it out like that, Steve. Marcel, thanks for starting this thread! Hope I haven't steered it too far from your original goal. Josh

**Re: Model Sharing**

Date :7/1/2005 1:23:05 PM Poster : Maxwell Craven

Regarding your Un-Holy Grail, take a look at Steve Ward's tip Bizarro models.

**Re: Model Sharing**

Date :7/1/2005 6:42:14 PM Poster : Steve Eberbach Josh: I do not think you have steered this topic off Marcel's track at all. In fact the track is getting more solid as we build it. We could change its title to "Sharing Experiences" to include more generality, just as the "New Market Wizards" shared even more important information in the format of experiences than they did in the form of "models". Marcel himself said experience is the essence from his own viewpoint. I think that is the purpose behind Steve Ward's creating this forum as support of the software. Quoting Monroe Trout from "The New Market Wizards": " ..if we blindly followed the systems we might make half of what we do now. Maybe even less. I could give 10 CTAs the exact systems we use, and some of

them still wouldn't make any money."

Now, a CTA is a pro by definition, running his/her modelling advice as a serious business. Put that together with the fact that Trout's team of traders trades from MODELS, many of them, just like users of NeuroShell Trader Pro! Make your own inferences from that! Maybe Trout even uses NST pro and a team of modelling Geeks instructing his Floor traders! To be repetitive: Marcel says: "EXPERIENCE is the essence here". More thanks for starting this thread, Marcel!

Really practical, tradable "total packages" will be a complex of "edges", (models which really work) and good money management, just as Trout said. (Unless you don't believe a successful multi-millionaire trader) If you read between the lines in Trout's and others' interviews, we little Traders have an edge called small size. We can execute our entire position faster!

The edge from any particular trading model will break down if there is too much size being triggered by its signals. (a factoid from the wizards' combined experience)

To answer Josh's particular questions: Yes, you understood very well what I was saying, and said it back in your own words even better than I explained it. Yes, an entry signal using another model's stop can be "identified with an indicator". An example would be: SUB(position (StopStrategy)), lag1 (position (StopStrategy)) A change in position from hitting the stop generates a indicator spike one bar later. Using an indicator directly to give a signal would work to give a go or no-go for the next bar, but would not give you exact feedback from stop price for the optimizer through the equity curve, drawdown accumulation, etc. because of the equity posting delay from only marking price at the close or next bar open to your equity total accumulation.

The example I gave gives a SIGNAL one bar late. The SIGNAL from the basic stop strategy Template is "always try to trade next bar against current position, and do so when stop is hit". So you cannot use the signals (there is a signal every bar), you have to use the actual position of the stop strategy as the input for your strategy which combines the simpler models. While your stop-based strategies change position inside the bars, the signals are "known" only at the close. I call such models by the name "Discovery At Close" (DAC) models to remind me of that. How does this relate to Anti Grail? While it is not motivated by it, it is as you suspect, related. See Steve Ward's post in the tips about "Bizarro". Example: We know (from reading Market Wizards!) that the Big-Firm floor traders can move prices to hit the stops we just set up in our Turtle-like template. While they succeed, the equity curve of our stop model suffers a declining trend. But they don't always succeed, or they would be long ago retired. (Unless they are obsessed, in which case their "size" gets too obvious and cumbersome) So what I try to do with the NST optimizer, is find what conditions under which their strategy of "running the stops" fails or succeeds. When my equity curve falls, the floor traders are winning, when it rises, something bigger is overwhelming their little game. That is an example of what I would call a "Strategy". You can try to extract information from the market prices based on modelling what the traders admit they are looking at when they trade, and rather than blindly following their methods, try to decide who is winning, and who is losing, and when, and how much. One trend you CAN depend on is that the game goes on and on. The traders won't stop hitting the ball back and forth. Referring to the Turtles-style Breakout example, the Strategy Template can mark the STOP PRICE (hypothetically) execution to market equity instead of the closing price or next bar opening price. The Strategy Wizard puts the red and blue X's right at the stop prices;



they are reflected in your trading statistics you optimize with the optimizer, but you still don't know how many times the actual price crossed the Stop!!!! Maybe you paid ten times for just one trade! Really you would need tick data or a trader on the floor. That's probably a decent example of what Trout means when he says his EXPERIENCE with computer models (in New Market Wizards) is that maybe half his profits are the "edge" from the models, and the other half from discretionary execution, etc. Steve

### **Re: Model Sharing**

Date :7/7/2005 2:55:24 PM Poster : Marcel All, First of all, thanks for keeping this thread alive while I was away - following Josh's advice

([http://www.ward.net/cgi-bin/Forum/Forum\\_Article.asp?a=2465](http://www.ward.net/cgi-bin/Forum/Forum_Article.asp?a=2465)), I've taken a break to recharge my batteries... It's very interesting to read all your comments and to assure Josh and Steve, I've absolutely no issues with how this thread is evolving. I fully concur with Steve that the main aim is to SHARE EXPERIENCES, to learn, to avoid costly mistakes, to become better and

ultimately be able to exercise some profitable trades. But I'm also a very pragmatic and practical guy, and I feel like taking the (maybe arrogant) liberty to make a plea: "Dear experienced users of NST, please share your models, the more the better. You will have the opportunity to see and analyze models of your peers and fine-tune your own ones." To be straight-forward and direct, I believe we should start to share some successful \*.cht files based on UP-TO-DATE DATA. Most of the NST users have in their earlier days probably gone through many of the available examples or templates on CD or posted on

the Ward Systems site, only to find out that these were successful for PRECISELY the dates they were posted. If you move forward or backward the (model) dates, their performance drastically drops until becoming negative. If you apply them to other stocks, it simply doesn't work. So I ask myself:

- . How do contemporary models look alike?
- . Do they still exist, considering that stocks falling out of "normal trends" are becoming the norm (2000 bubble, commodity/energy rush)? -Are my models good enough – or unacceptable for others?

Thanks! Marcel

### **Re: Model Sharing**

Date :7/11/2005 2:51:17 PM Poster : Mark Simpson

Hi All,

To me, a model is the end result of a process, and that the best place to start is finding out what needs to be done, then finding/building the tools to achieve that and then finally ending up with a working model, rather than just trying to find a working model.

Another way of looking at it is, are we looking to be provided a rod, line and the location, or do we want to learn how to fish?

Models tend to be very specific to peoples risk level, trading timeframes and interests. An ideal model for one individual probably isn't ideal for another. Also people tend to have a lot of IP tied up in their models, so are generally unwilling to share due to the risks involved in doing so.

However, people quite often are willing to share concepts, methods or techniques.

How about a discussion starting with "What needs to be achieved to build a profitable Neural Net"?

Then maybe we could progress into a discussion about the tools/needed. Suggested items to start with could be:

1. What neural networks can learn, and what they can't learn.
2. Heisenberg, Filters, What is lag. Removing lag, and creating/using leading indicators.

1. Curve fitting. What it is, how to avoid it and how to use it to advantage.
2. Normalizing Time.

I also, don't want to misdirect this thread. If there's enough interest, then I'll start the discussion with a "demonstration model" that can be used to figure out the first question "What needs to be achieved to build a profitable Neural Net?".

Regards Mark Simpson Bowfort Technologies

**Re: Model Sharing**

Date :7/14/2005 3:31:32 PM Poster : Marcel

Mark,

I fully agree that the key to a successful model is to master its building process. My call for models was intended to pick it up from the tail: Analyze the models, understand the key success criteria and the development process, discuss alternatives and generalization potential, etc. But I'm perfectly fine by doing it the "forward way".

I have only one little request, to start our discussion pragmatically. The more it evolves, the more we will be able to introduce more complex themes and/or advanced paradigms. Why? It's simply to attract more contributors. Most of the forum's visitors are pretty new to NST, and are maybe "afraid" to reply to an article. So let's create a platform where all can contribute, let's keep it simple to start, let's maybe build together a model that everybody can replicate. The discussion will organically evolve as and when more experienced users will add their own points of view, share their knowledge or bring up new ideas.

Mark – If you allow me, I'm going to start the thread "What needs to be achieved to build a profitable Neural Net?" for you. I will try to briefly document the process that I follow for myself, and hope for many, many replies, critiques and other opinions/processes.

Regards, Marcel

**Re: Model Sharing**

Date :7/25/2005 7:20:18 PM Poster : Alan Rhodes

And I will be trying to centralize our thoughts into one project plan.

**Re: Model Sharing**

Date :7/16/2005 9:15:03 PM Poster : Alan Rhodes

I am not really sure what else there is to add to your topics. You covered the main obstacles we face building trading models.

Since I work in the computer business, I have a different slant on things. Besides understanding concepts, I do feel discussions can be utilized to better analyze what tools can do and can't do. These can be purchased tools and home built tools. Concepts develop the specifications for the tools we need. We also need to know what tools can do to meet those specifications.

I had a former life as a forester before I got a BS in computer science. As a forester, the more the understanding about the place you worked, the better you were. You needed to know about your climate, your soils, your ... to better understand your ecosystems and how to manage them better (or in reality, not screw them up on a long term basis).

The one culture shock I went into computers is that I needed to learn how to deal with black boxes. I knew everything there was to know down to assembly language programming in my first PC. That was no longer true in my second computer. My main goal in much of my job is knowing what a tool can and cannot do. If there is not a tool, my job is to develop specifications to have a tool built.

The H,L,O,C/4 you posted later is a demo of a tool. My trading partner actually went as far to test 6 inputs (though the results were not enough better that I started using that instead of H,L,O,C/4). You sell tools (very useful ones I may add) and donate tools for free on your web site.

For those of us with full time jobs, family, etc, if a solution cannot be built with tools, we are screwed. I am hoping the math behind much of what is done does not need to be understood. I obviously hope so since I am pursuing it. But even in my case, I daydreamed a tool, asked Ward systems if there was any way to do it in NeuroShell, and gave up. But my friend independently thought of the same thing and is programming it. And if my theory is correct, it should serve as an excellent adaptor into your adaptive indicators. So I speak with forked tongue.

Just to clarify, as an analyst, I seek to clarify what needs to be done (as you spell out, reduce lag is one). As a model builder in NeuroShell, I also seek to know what can be done with things available. I am hoping I do not need to know how those things do it.

**Re: Model Sharing**

Date :7/12/2005 6:03:11 PM Poster : Sunny Marcel, Several months ago I posted several links under the Trend Trigger Factor title. This is a single indicator that can be

used under MetaTrader for forex trading. Moreover, I attempted to call attention to both its strength and its weakness as an indicator, and I asked for a programmer for NS to convert the code (which was also provided). In addition, I provided real time charts (at the time) of the indicator in action. To my surprise, not a single reply was received. I assumed that other people either found the indicator to be worthless, or they used it without posting further progress. To summarize, I was disappointed to find the lack of response to what I have found to be a very useful indicator. This lack of response has made me a little bit more thick-skinned when it comes to sharing indicators or systems in the forum. I find this to be quite a personal disappointment since I have learned quite a bit from others who have also posted in this forum in the past. Best regards, Sunny

### **Re: Model Sharing**

Date :7/14/2005 7:46:44 AM Poster : Marcel Sunny, Thanks for sharing your "disappointment", I believe it does help to create awareness and eventually revitalize this forum. I'm of pretty stubborn nature and don't give up that quickly. Based on the feedback received so far, I see some ground where we could build up an interesting discussion - I've something in mind, just need time to implement, maybe today or tomorrow. Keep on visiting these pages; I'm looking forward for your contribution and feedback. Cheers, Marcel

### **Re: Model Sharing**

Date :7/14/2005 12:18:35 PM Poster : Steve Eberbach Sunny: I have to jump in here, because I intended to take on your proposal. Anyway, since I have MetaTrader 4, I set out to try this strategy, but quickly discovered that it would not work with MetaTrader4. I went to the MetaTrader Forum, and found discussion saying that the TrendTriggerFactor code has a future leak making it seem to do better than one should expect.

Meanwhile, Trend Trigger Factor was posted on Ward's NST. So I downloaded it and tried it, with dismal results. I decided to wait until I could run it again on MetaTrader4, which perhaps can be done now, since the strategy tester in MT4 is now working. I suppose that I should have announced my progress, or lack thereof, rather than just giving up. Discouraging experience, I suppose is just as important as encouraging experience. In this game, I get more of the latter. My sincere apologies, Sunny. Steve

P.S. If I find out anything from MT forum, I will report it, since at least one other member of this forum is interested. Just getting a published strategy which works on one platform translated to another platform is certainly the kind of experience we can share here without offending anybody unethically.

### **Re: Model Sharing**

Date :7/15/2005 2:00:24 AM Poster : Sunny Steve, As I mentioned before the indicator that I posted will only work with MetaTrader 3.8. I have not seen this indicator yet for MetaTrader 4. MT 3.8 is no longer supported; however, you might be able to get a copy from the Yahoo forum. (I am traveling now until the end of the summer so my copy of MT 3.8 is in my main computer. If you are interested, I can make it available to you in September.) I have found the indicator to be quite useful in the 4-hour, daily, and weekly charts. (Some programmers in the MT forum like it and others don't.) However, I use it not as a

main indicator, but rather I use it as a double check on other indicators. In addition, I tried the version available in this site for NS; however, the results are quite different and similar to the ones you got. My results in MT 3.8 appear to be better; however, I am unable to program, and for this reason I provided all of the above information since I thought if it works in one platform it should work on another platform. You can double check the indicator's results by looking at the charts that I posted and comparing them with NS charts. You can see that the results provided in MT 3.8 catch the tops and bottoms quite nicely. I appreciate in letting me know of your experience with the indicator. (By the way, I have used some of your indicators with good results), and there is no need to apologize. :-)  
My results are kind of like Thomas Edison's results --99% perspiration and 1% inspiration (misquote). Regards, Sunny

**Re: Model Sharing**

Date :7/15/2005 1:41:09 AM Poster : Sunny Marcel, I like your optimism since this is key for this game. I will be interested in following your work in the days ahead.  
Regards, Sunny

**Re: Model Sharing**

Date :7/25/2005 7:18:03 PM Poster : Alan Rhodes Since Mark Simpson gets at the problem, I will state the obvious. I have no desire to share my models since I have nothing to share. While I have a system which I think is profitable, it is a totally conventional trend reversal system. I want to develop the unconventional. Mark is getting at how to do the unconventional. I will be reviewing posts and try to develop what I think is a project plan for developing the unconventional.

**Re: Model Sharing**

Date :7/26/2005 1:47:53 PM Poster : Marcel Alan, I think that for the purpose of developing "the project plan", it would make sense to qualify conventional vs unconventional systems. Could you please elaborate on the definition of "unconventional", or give some examples so that all contributors/participants have the same understanding and can share the same objective? Thanks, Marcel

## Simple technique for removing some noise

Date :7/12/2005 10:56:26 AM Poster : Mark Simpson Hi,



Here is an extremely simple technique to remove some noise in models with sub 1-bar lag that came out of some of my research a few years back

All you do is, if you're using "close" as your series for an indicator, use Average4(Open,High,Low,Close) instead. It works on pretty much anything provided you have liquidity, and provides a higher signal to noise ratio.

On it's own, it's not going to make the difference between a good system and a bad system, however it can help improve profit in a good system.

You can also use Average2(High,Low) as a runner up, if you don't want to use open for some reason.

Over time, dynamics change and sometimes low may have the highest signal to noise ratio, or any of HLC or any average of OHLC (and there is some good modelling in how those dynamics change), however, consistently OHLC/4 provides the best signal to noise ratio over time, so is beneficial to use as a close proxy.

The chart includes a Cumulative Sum of the Signal To Noise Ratio of the series being tested. Essentially the higher the value, the more consistently high the signal to noise ratio of the signal is.

Yellow = Average4(O,H,L,C) Magenta = Average2(H,L) Green = H Red = L Cyan = C  
Mark Simpson Bowfort Technologies Inc.

## Re: Simple technique for removing some noise

Date :7/21/2005 1:36:59 AM Poster : Alan Rhodes

One side question, actually more for Ward Systems. Anytime I try to  $H+L+O+C/4$  as the indicator I am trying to predict, all I ever get is one trade. Is this correct? I can train for maximum correlation, but even that gives strange results since the total out of sample correlation is often higher than any individual work forward tests.

**Re: Simple technique for removing some noise**

Date :7/21/2005 10:39:31 PM Poster : Alan RHodes

I was half asleep when I posted this and asked a question which I had struggled with a long time ago, and asked it all wrong.

First, there will be no trades since the prediction is always greater than 0. But my main frustration is that the prediction is often just a reflection of the price behavior, even if predicting 8 days in advance, which is not possible. When using values from the pull down list, I get a normalized net that makes sense.

## **What needs to be achieved to build a profitable Neural Net?**

Date :7/14/2005 3:37:32 PM Poster : Marcel

All,

1. Preamble: As commented in the previous thread "Model Sharing", this new discussion is intended for ALL users of NST. Beginners should herewith get a chance to verify whether they correctly learned their first steps, experienced users will be able to steer and move the discussion into more specific areas of interest.

2. The background:

Before describing the process, let me portray what I do in the context of NST:

- I trade mainly stocks and some derivatives (options, warrants)
- I trade mainly on US markets, plus some European issues
- I trade both sides, long and short
- Trading is unfortunately only a hobby, therefore no Intraday I'm currently working with a universe of instruments that include:
  - Dow Jones Industrial stocks
  - S&P 100 stocks
  - Nasdaq 100 stocks
  - Euro Stoxx 50 stocks
  - SMI stocks
  - Some selected currency pairs
- A few commodity and Treasury Notes In total I've roughly 500 underlying instruments, for which I update daily the End of Day prices.

3. The development process:

a) Idea generation

The motivator can be an article describing a new concept to me, or an older model that I browse through (e.g. one of the examples provided on the CD), or a new indicator I discovered recently, or a colleague that asks me for a specific predictive analysis. But most of the times it's the fact that the current model(s) is not performing the way I expect or does not generate (anymore) the wished signals.

b) Draft creation

I rarely start completely from scratch, I usually take as a template one of the models I have at hand and try to adapt it to the new idea. At this point in time, I use a set of maybe 10 instruments whose charts I know by heart. If I'm trying out a new indicator, I'd simply try to analyze it's efficacy with regards to being an input signal.

My latest models all share the same principle, an enhanced versions of one of the examples provided on the CD (I think it's Example 6). I have 3 NNs that independently deliver signals to a trading strategy, which ultimately decides and produces the short/long signals. No model has the same set of NNs. In one model the 3 NNs take input from different categories of indicators, while in another the 3 NNs use the same indicators, but set in such way that they consider different timings (short/medium/long term). By default I make little usage of optimization, limit the amount of EoD data to 4-5 years and usually define 1 or 2 walk-forward test periods of 6 months.

This stage requires a lot of trial & error: I experiment with those wizard parameters I'm



most familiar with, then copy/paste the most relevant statistical results into an excel sheet, try the next parameter, copy/paste, etc. After a while I get a picture of which parameters provide the best results for the sample. I create variations of the models and retain those that look to be the most promising.

#### c) Model testing

Once I have created what I think is the best set of model variations, I test them with the full set of 500 instruments I've in the database. Depending on the degree of optimization, this can take quite some time, but I tend to discard those model variations that take more than a night to complete – simply not practical.

With regards to the data, I keep a set of EoD data for all instruments frozen for a particular date, usually the weekend before I start the development. The development of a new model may take a few weeks to complete and I want my reference data to be consistent over this period of time.

#### d) Selection and verification

I will then do a lot of manual copy/paste, recording in an excel sheet the results of those instruments that fulfill the following criteria:

- . Out of Sample statistics:
- . more than 70% successful trades
- . double performance than buy & hold strategy
- . yearly performance of at least 30%
- . Visual check of Out of Sample chart:
- . buy/sell signals placed at the right turning points
- . no major mistrades or periods of inactivity in the chart
- . no major drawdown

If the above 6 criteria are fulfilled, then the model variation with this particular instrument qualify for what I call "tradable list". In average, I'd be able to produce maybe 5-10 instruments for a particular model variation. If the same instrument is present in more than one model variation, I'd keep only the one that I deem the best.

Note: I'm not completely satisfied with my Selection/verification stage. In a recent thread "Empiric Selection Criteria", I've tried to address some concerns and ask a few questions. I'm currently testing the good hints I got there, but I'm also very interested in other's opinions.

#### e) Implementation

I don't wait long before starting to trade – I don't have the patience to go through another paper trading phase! I'd start to trade a subset of the new model's instruments right from day one, first by "fooling" the system and buying those instruments which were filled in the past and are negative [that's not a joke, I did it!]. For the others, I'd wait and as and when new signals are produced, I'd go long/short accordingly.

Other considerations relative to Money Management are out of scope here and may be addressed in another thread.

1. The trading process
2. A demonstration model

The daily process is very simple and takes only 15 min: In the morning I update the

database with the latest EoD data, and I then open all the models and check for new signals. Trades are placed accordingly with the various brokers.

I'm enclosing one of the models I've produced about 2 month ago, that for the sake of this forum I will call "ForumSample001". [I hope that the WebMaster can create the link for the download here.] **The file referenced may be downloaded using the following link:**

[ForumSample001.zip](#)

The model was trained with data up to 31.5.2005 and produces somehow usable signals. It's not the best I have in my arsenal, but it's one of those that do not need any specific add-ons or licensed indicators. If we share models, I think it's important that we select those that can be used by most users – i.e. no intraday, no add-ons.

It qualified for 6 stocks as well as the US 10Y Treasury Yield. Although I follow them with my watch list, I haven't yet traded them.

Best regards, Marcel

### **Re: What needs to be achieved to build a profitable Neural Net?**

Date :7/15/2005 12:46:27 PM Poster : Mark Simpson

Hi,

Firstly, "Danger Will Robinson", do not use this example for trading. This example will not produce any realtime valid signals.

[Click here to download chart referenced in this post](#)

This chart is designed to illustrate what needs to be achieved to build a conventional profitable neural net using conventional indicators. It demonstrates the effect of lead on an indicator. (i.e. bringing the future forward). The idea being, to figure out what needs to be achieved to build a profitable Neural net.

You take an indicator, lead it by N bars, and predict Percent Change In Open 10 days. Essentially we're calculating the amount of lead we need for a neural net to effectively predict price.

I've picked RSI in the example, but you can replace it with pretty much any regular conventional indicator, i.e. Stochastics, MACD etc., provided you keep around the same number of periods (10).

You can also change the number of periods and retrain the nets, however you'll need to change the lead too. Essentially the longer the periods in the indicator, the more lead you'll have to add. (That equates to lag in a filter).

I've put data for the sp500 in the chart, however you will find it works on pretty much anything that has liquidity and in any timeframe.

I've kept this simple for purposes of example, but I suggest you also convert this into a TDNN (Time Delay Neural Network), to get even better results. (see my previous postings on this).

In summary:

Lead Bars Correlation Percent Profitable Trades Ratio Avg Win/Avg Loss 0 -0.0876

50% 0.11 1 -0.0262 92% 0.63

. 2 0.179 88.7% 3.71

. 3 0.315 80% 3.76

. 4 0.415 85.5% 2.88

You will find from the above results and the chart that at 4 bars lead, the net has learnt very effectively. 332.7% Return on a daily sp500 is good going, all with no optimizing. In practice I find with periods of around 10, that for most indicators, the amount you have to lead by to make obscene profit is about 3-4 bars lag. To just over break even (i.e. you could say the point at which you start making a small amount of profit), is 2 bars.

Most indicators introduce lag, and the lead we're adding is offsetting that lag that's been introduced by the indicator (in this case RSI). Therefore, to be profitable, we need to remove (or workaround) lag. In this case we want to remove 3-4 bars of lag.

Because of every trade consists of an entry and exit, we have 3-4 bars of lag we need to remove twice, i.e. for any trade, we need to remove 6-8 bars of lag.

Now we have a template for a system that makes money. Next stage is we need to figure out is how to remove lag. To do this we need to understand some concepts like Heisenberg.

However, there is one REALLY easy way to remove 3-4 of those 6-8 bars immediately, which essentially gets you into that 2 bars on entry and 2 bars on exit area, i.e. "Just Profitable". After that every bar of lag we save will make a huge difference to return.

Ever heard of the saying "Take Your Profits and Run?". If you set small target values as your exit point, then you have "Zero-Lag" on your exit. I.E. You've immediately removed 3-4 bars of lag. (it's wise to set a stop limit at 1/2 your profit).

Personally when I figured the above out, a light bulb switched on for me, and I hope this can help that light bulb switch on for some other people too.

Comments?

Mark Simpson Bowfort Technologies Inc.

**Re: What needs to be achieved to build a profitable Neural Net?**

Date :7/18/2005 3:17:01 PM Poster : Ward.net Webmaster

Thank you very much for this contribution. We apologize that we didn't get it up for the weekend.

**Re: What needs to be achieved to build a profitable Neural Net?**

Date :7/18/2005 9:38:14 PM Poster : Mark Simpson

Hi,

I've had a couple of people ask me about TDNN directly, so here's the scoop with an example chart and an image of the process.

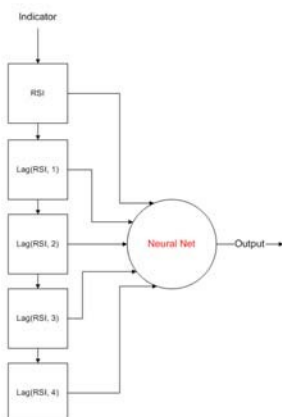
Firstly, here's a test for your complex built in neural network that we were all born with. The closing price today of ticker XYZ was \$65.23. What will price do tomorrow?

See the problem?

We would ask, what did price do the day before, and the day before that, i.e. I would be looking for a pattern in price. The price on it's own isn't very helpful. Computer based neural nets are no different. Neural nets have no concept of

events over time unless we build a neural net to incorporate that feature. So feeding say RSI 5 into a neural net makes it difficult for it to learn as it's only one point in time and it has no reference to other points, all it can reference is what it's already learnt about a particular point. E.G. It might learn that an RSI of 80 means sell, but not every RSI of 80 in real life does mean sell. A pattern of RSI peaking maybe more likely to mean sell than RSI being pegged at 80 for 40 bars for example.

This is where Time Delay Neural Networks (TDNN) come in to play. They provide the ability to recognise patterns in the data being presented, and they're pretty simple.



All that needs to be done is to take your indicator and feed it into the neural net with various lags of the same indicator, e.g.

RSI(5) Lag(RSI(5),1) Lag(RSI(5),2) Lag(RSI(5),3) Lag(RSI(5),4)

Essentially you're creating a time delay process where on every new bar the previous bars moves down in the list, like people waiting in line.

Now you can recognise patterns in data.

This is the way to achieve it manually in prediction wizard, however there are other ways of achieving the same process. E.G. Ward's Adaptive Net Indicators with their LagPredict feature (highly recommended) . And also, any indicator that recognises a pattern, like the inbuilt candlestick patterns etc.

However there is a price to pay, which is every input you add to a TDNN adds (at least) 1 more degree of freedom (DOF) to your model, which means you will require more trades to test your model and avoid curve fitting.

There is some more information about it in a previous post I made on January 12th 2003.

BTW I'm not advising using a conventional RSI, it's just for purposes of example.

[Click here to download the chart referenced in this post.](#)

Regards Mark Simpson Bowfort Technologies Inc.

### **Re: What needs to be achieved to build a profitable Neural Net?**

Date :7/20/2005 8:20:35 AM Poster : Marcel

Mark,

The TDNN principle you are introducing here is interesting. I've been experimenting a bit with the example you provided, and I'm afraid I will have to ask a few questions.

a) Can not replicate the exact same NN Although I've checked and re-checked all the options one can enable/change within the wizard, there is no way I can replicate exactly the same NN. It looks as if there is a hidden option that I can't modify. Any idea why?

b) Reliability Although trying several different conventional and non-conventional indicators, it seems to me that the NNs are behaving irrationally. Periods where signals are generated consistently are followed by other periods where absolutely no signal is given. This can last 300 bars or more and is usually induced by a change in the long-term trend. Did you observe the same behavior?

c) Applicability I may have to further experiment, but maybe you can give us a little hint in which context you implement this principle:

. As a standalone NN – or in conjunction with other NNs?

. You are mentioning “not advising using a conventional RSI”, which are the indicators you would therefore advise to use?

. How much have you been able to generalize TDNNs, do you see its application for very selected instruments only or can it be broadly used?

Thanks a lot. Cheers, Marcel

### **Re: TDNN: What needs to be achieved to build a profitable Neural Net?**

Date :7/20/2005 11:58:45 AM Poster : Mark Simpson

>Mark,

>The TDNN principle you are introducing here is interesting. I've been >experimenting a bit with the example you provided, and I'm afraid >I will have to ask a few questions.

>a) Can not replicate the exact same NN >Although I've checked and re-checked all the options one can enable/change > within the wizard, there is no way I can replicate exactly the same NN. > It looks as if there is a hidden option that I can't modify. Any idea why? There are no hidden options. All you do is put:

Lag(RSI(Close,N),0) Lag(RSI(Close,N),1) Lag(RSI(Close,N),2) Lag(RSI(Close,N),3)  
Lag(RSI(Close,N),4)

as inputs into a neural net, where N can be anything reasonable. Of course Lag(RSI(Close,N),0) can be replaced by just plain RSI(close,N) as they are logically equivalent.

It doesn't have to be 5 inputs, you can detect peaks and valleys with a minimum of 3 inputs.

>b) Reliability >Although trying several different conventional and non-conventional indicators, > it seems to me that the NNs are behaving irrationally. Periods where signals > are generated consistently are followed by other periods where absolutely > no signal is given. This can last 300 bars or more and is usually induced by > a change in the long-term trend. Did you observe the same behavior? Correct. The NN is now learning patterns rather than just values (Overly simplified, because neural nets just see inputs). So if it sees new patterns which it hasn't learnt on, then it is unable to predict.

c) Applicability >I may have to further experiment, but maybe you can give us a little hint in > which context you implement this principle: >- As a standalone NN – or in conjunction with other NNs? You could do it as either. However it's only a technique that can be part of a model. I.E. A model will use many techniques. Any single technique on it's own will not be profitable, but it's from a combination of techniques that you can derive a successful model.

>-You are mentioning “not advising using a conventional RSI”, which are the > indicators you would therefore advise to use? I just wanted to make it clear that this is an example of a technique. It won't make you money on it's own. However you can combine it with other things to make money. As to advising on using particular indicators, I don't. Essentially using an indicator depends on what you are doing, what the needs are, and what the context is. However, I will be later discussing (if these threads show significant interest), classes of indicators that work, and why they work, and how to identify the rest that don't, and maybe a bit about how to fix the ones that don't. However to identify these classes, these concepts we're discussing now should be understood. I'm trying to provide a model to build models.

> -How much have you been able to generalize TDNNs, do you see its > application for very selected instruments only or can it be broadly used? It can be broadly used as a technique in a good model.

The advantage is that you're giving a NN the ability to recognise patterns (just like we look for when we look at charts), however the trade off is you have increased degrees of freedom if you optimize or curve fit by stock selection, so you need more trades to validate the model to avoid curve fitting.

Mark Simpson Bowfort Technologies Inc.

### **Re: TDNN: What needs to be achieved to build a profitable Neural Net?**

Date :7/21/2005 12:53:11 AM Poster : Alan Rhodes

There is one part of the experiment you had me do with S&P 500 that I stumbled on accidentally that opened my eyes. Since you explained it to me, I am going to gossip and explain it to everybody else. I hope you don't mind me gossiping.

I found that an indicator like a moving average had no predictive qualities. In other words, feeding a lead(moving average,4) into a prediction did not make a profitable prediction. I immediately emailed you and went "Huh?"

You gave me a one sentence response that said it all, "The moving average has no context." I thought and realized that means, the more context you provide a neural network, the greater the potential you have. The TDNN is a way to provide more context. And the corollary is the more context you provide, the greater the opportunity for overoptimization.

### **Re: TDNN: What needs to be achieved to build a profitable Neural Net?**

Date :7/21/2005 4:16:40 AM Poster : Marcel

Mark,

Some more comments and questions:

a) Can not replicate the exact same NN Apologies, my default setting for “Trading rules used to calculate trading statistics” were different from yours, hence the

discrepancy in the output.

b) Reliability > "...now learning patterns rather than just values..." I understand your reply – looking forward to discover the other building blocks and get the full picture soon.

For the time being, allow me however to maintain a little degree of skepticism. For example, I question the validity of a NN that generates signals in the out of sample period while having been completely quiet (one or a few signals) during the training period.

- . Did the NN really learn or is it irrational or random behavior?
- . What are the causes that stop/start a NN to generate signals when no new pattern is recognizable on the chart?
- . How to validate/discern those phases with useful signals from the impractical ones?

c) Applicability > "...discuss classes of indicators that work, and those who don't..." I'm very interested in the above to validate my observations and conclusions, let's put it on the "to do list"...

Regards, Marcel

### **Re: TDNN: What needs to be achieved to build a profitable Neural Net?**

Date :7/21/2005 1:48:28 PM Poster : Mark Simpson

>For the time being, allow me however to maintain a little degree of skepticism.  
> For example, I question the validity of a NN that generates signals in the out  
> of sample period while having been completely quiet (one or a few signals) >  
during the training period. Skepticism is always good.

> -Did the NN really learn or is it irrational or random behavior? This will be addressed by a future topic.

>- What are the causes that stop/start a NN to generate signals when no new pattern is > recognizable on the chart? Neural nets learn by example, just as we do. Lets do a quick experiment with our inbuilt neural nets.

Input1 Input2 Output 2 2 4

We know that output is a function of the 2 inputs, lets call Input1 X, and Input2 Y. So we have a function:  $f(X,Y)=Output$  We have to figure out what the function is. Now what's the formula that produces the output from the 2 inputs?

You're probably thinking, well that's pretty simple,  $2+2=4$ , or you might come up with another solution:  $2*2=4$ . But is it correct? We've formed an assumption on just 1 example, so lets try another example.

$f(2,3)=4.5$

Now we have to reject our original theory as to the function, it doesn't work for this example. So what now?

Well, one approach maybe to provide even more examples, and eventually you could figure it out. (a mathematician might try a more targetted approached based on his experience, and feed values like  $f(0,0)$  to see what the function does). Worse case with enough examples you would have a close enough example to estimate an output value based in it's closeness to one of your

examples.

A neural net is nowhere near the complexity of your brain, but you can think of it like a function learning machine. It doesn't try to figure out the function by testing, it tries to estimate the function by learning by example. I.E. You feed it examples and the desired result. The neural net runs your example, and compares its output to yours. This produces an error, and the neural network is updated slightly and the process occurs again. Over many iterations of this process, the error between the net and what you are feeding the net for output becomes smaller and smaller, until you reach a minimum where you are seeing no or minimal improvement. At this point the net has learnt, and then you can roll it forward on new data.

Now you should be able to see from the above, that the net's ability to learn depends solely on the quality of the examples. One example, and it won't learn effectively. Examples all concentrated around certain values it won't learn effectively either.

I.E. We need to provide examples that fully cover the data we intend on feeding into the net. If you cover the examples space comprehensively then the net will likely learn well.

Noise also comes into play here, if data is bad, or there isn't a relationship between input and output, or noise level is high, then you're asking the neural net to learn something that isn't there. It will dutifully learn the best it can, but the results won't be useful.

Interestingly enough, it doesn't really matter how complex the function is either, it will learn it just as effectively too. Also, you can estimate non-linear functions too because the net contains non-linear activation functions. So what you have in your lean mean neural machine is just a simple learn by example function estimator. There's never any function stored in the neural net, it's just the result of error minimization.

Incidentally, the function was:  $((X+Y)/2)+2$  :-)

The issue for a lot of people (me included when I started off) was that I didn't truly understand what a neural net was doing. I treated it as a magical black box, which did things that were truly wonderful, but I wasn't sure how :-). Now I regard NN's as being dumb functional estimators that depend on clean data with a relationship being fed to them. Essentially you have to do the leg work first with the inputs/outputs you're providing. If there is a function there, the neural net will find it, and the clever part is that it saves you having to figure out the relationship. But the relationship MUST be there first.

Case in point. (you've probably heard of this before, I don't know if it's folklore or not, but it illustrates the point). The US Military in the 1st Gulf War, trained a neural network to visually recognize enemy tanks in the field. When they put it to use, it didn't work as expected. They did some more testing, they realized that all the learning examples they'd provided the nets with tanks in were on Sunny days. The neural net had learnt to detect the difference between a Sunny day and a Cloudy day, and not if it had a tank in or not.

The solution of course is to provide tanks on sunny and cloudy days whilst learning. However, what about "Green Fields" or "Desert" and so on?



I recommend if you still see a neural net as a magical black box, that you go through "Inside Neural Networks" demonstration that's provided with Neuroshell Trader when you install it (it should be under the Neuroshell Trader category on your start menu). Study it, and then maybe build your own simple neuron on paper to experiment with. Learning about how they work gives you a lot of insight as to what they can and can't do.

Mark Simpson Bowfort Technologies Inc.

### **Re: What needs to be achieved to build a profitable Neural Net?**

Date :7/19/2005 10:28:29 AM Poster : Marcel

Mark,

First of all thank you for mentioning Heisenberg, it gave me the opportunity to spend valuable time going through his biography and principles, and recall remote memories dating over 20 years ago when I was studying quantum physics...

I stepped over the lead() function pretty soon after receiving NST, and after having developed several models that were achieving incredible performance and accuracy, I was obviously delighted believing to have found the perfect model. My joy didn't last long however, my skepticism about the results lead me to discover the flaw. I guess a classical mistake for many beginners, since the issue has been already addressed in several threads.

In simple words, one cannot create a model that relies on future data, that's what the lead() function implicitly does. When you work in real-time, the system won't produce any signals, since future data isn't yet known or available. Signals will be plotted on the chart delayed by exactly X bars (days) later, X being the "periods ahead" specified with the lead() function.

This clarification was for those who may not yet have experienced the negative consequences of the lead() – not for you, Mark. From your article I got the impression that you want us to understand, that there is way to constructively make use of the lead(). I thought "either is Mark miles ahead (Heisenberg?), or I'm missing something here".

For the purpose of this present discussion, I've therefore taken the example and enhanced it so that I can visualize your logic.

[Click here to download the chart](#)

a) "Lead 4 – Lagged 4" strategy:

First I created a trading strategy that simulates the worst case, which is "acting upon signals that are generated with a delay of 4 days". Technically speaking, I've added a 4 day lag to the "Lead 4" network. These are the results (original "Lead 4" in brackets):

Annual Return on Trades: -7.20% (83.10%) Percent Profitable Trades: 33.30% (85.50%) Ratio Avg Win/Avg Loss: 1.36 (2.88) Maximum Drawdown: \$829.07 (\$131.90)

No surprise at all, acting with 4 days delay completely destroys the model – and we haven't yet considered transaction costs!

b) "Lead 4 – Lagged 2" strategy:

Following Mark's comment "there is one REALLY easy way to remove 3-4 of those 6-8 bars immediately" I thought – why not see what happens if we hypothetically consider a

delay of only 2 days instead of 4. These are the results (original "Lead 4" in brackets):

Annual Return on Trades: 73.80% (83.10%) Percent Profitable Trades: 97.10% (85.50%) Ratio Avg Win/Avg Loss: 3.05 (2.88) Maximum Drawdown: \$40.05 (\$131.90)

Well, this was a surprise! I thought the statistics would fall somewhere between the fictive case (Lead 4) and the worst case (Lead 4 – Lagged 4), but unless I did a mistake somewhere, the above results are indeed even better than one can hope.

c) "Lead 4 – Lagged 4/2" strategy:

The 3rd strategy intends to come a bit closer to a real case – we enter long/short with a 4 days delay, but exit with a 2 days delay (= average). This to follow Mark's comment "Take Your Profits and Run". These are the results (original "Lead 4" in brackets):

Annual Return on Trades: 30.00% (83.10%) Percent Profitable Trades: 58.90% (85.50%) Ratio Avg Win/Avg Loss: 2.09 (2.88) Maximum Drawdown: \$108.38 (\$131.90)

Annual return is down substantially, but depending on one's targets it can still be in the range. Profitable trades are still above 50%, but may be insufficient for some.

Drawdown seems good. The above does not yet take into account transaction costs, which may jeopardize the displayed results. Considering a fix traded amount of \$10'000 and costs of \$30 per trade, we get (original "Lead 4" in brackets):

Annual Return on Trades: 15.50% (83.10%) Percent Profitable Trades: 47.80% (85.50%) Ratio Avg Win/Avg Loss: 1.85 (2.88) Maximum Drawdown: \$920.77 (N/A)

At this point, the light bulb hasn't yet switched on for me! Some simple questions arise:

- . Is there a clever tactic that would allow us to come closer to the strategy "Lead 4 – Lagged 2" above?
- . We may be able to anticipate exits (e.g "Take Your Profits and Run"), but what about the entries?
- . Is there a way to systematically implement the "Take Your Profits and Run" approach – maybe trailing stop losses?
- . The example makes use of a simple RSI, what about all the effort we put in fine tuning our indicators?
- . Does this introduce the paradigm that (in the end) indicators are irrelevant, they all have the same effect?

I hope we can continue this discussion, maybe with the contribution of other readers...  
Regards, Marcel

P.S.: My apologies a) for another long article, b) to those readers that find the above boring, but the intention is to build up the discussion from the basics, advanced matters will follow soon...

### **Re: What needs to be achieved to build a profitable Neural Net?**

Date :7/19/2005 7:25:25 PM Poster : Mark Simpson

That is correct. Never use lead (or anything else which brings the future forward) for trading purposes. I've seen many models in the past where people do exactly that. Fortunately in NST it quite often shows up as "no prediction" for the most recent few bars, so if you ever see this in any of your models, alarm bells should immediately ring.

However, that wasn't what I was trying convey in the example model I provided. As I'm a concerned that I might have not expressed myself clearly enough, let's try again with a slightly different approach. I'll answer your questions in this post, and provide a different approach in the next post.

>This clarification was for those who may not yet have experienced the negative >consequences of the lead() – not for you, Mark. From your article I got the impression >that you want us to understand, that there is way to constructively make use of the >lead(). I thought “either is Mark miles ahead (Heisenberg?), or I'm missing something >here”.

No, there is no way I know of to constructively lead on it's own in a model in real life. However in this instance, I'm using it to build a simulation. By doing a simulation first, you can identify what needs to be done to make something profitable.

>Following Mark's comment “there is one REALLY easy way to remove 3-4 of those 6-8 >bars immediately” I though – why not see what happens if we hypothetically consider a >delay of only 2 days instead of 4. These are the results (original “Lead 4” in brackets): > >Annual Return on Trades: 73.80% (83.10%) >Percent Profitable Trades: 97.10% (85.50%) >Ratio Avg Win/Avg Loss: 3.05 (2.88) >Maximum Drawdown: \$40.05 (\$131.90) > >Well, this was a surprise! I thought the statistics would fall somewhere between the >fictive case (Lead 4) and the worst case (Lead 4 – Lagged 4), but unless I did a >mistake somewhere, the above results are indeed even better than one can hope.

This is the breakeven case I was discussing, the 2 bars you are referring to is 2 bars on entry and 2 bars on exit, =4 bars of lag removed from the 6-8. This is the just over breakeven point. I.E. With reasonable transaction costs you should be just making money.

>At this point, the light bulb hasn't yet switched on for me! Some simple questions >- Is there a clever tactic that would allow us to come closer to the strategy “Lead 4 – >Lagged 2” above?

Yes, using your approach it would be Lead 4 - Lagged 4 on entry and lag 0 on exit.

I.E. Use your regular short term prediction method (which should have around 4 bars of lag already in there), then use take your profits and run to exit (which is 0 lag).

> We may be able to anticipate exits (e.g. “Take Your Profits and Run”), but what about >the entries? Entry techniques and Heisenberg I'll discuss later if there's enough interest in these threads. So come on all you lurkers out there, respond. Do you understand the concept, do you not? :-)

>- Is there a way to systematically implement the “Take Your Profits and Run” approach >- maybe trailing stop losses?

yes, profit targets. Pick your entry price and say add "1-2%" to it. That becomes your exit price. Because you know the exit price now at time of entry, you have a 0 lag exit. (it would be prudent to put a stop order in at say 1/2 your profit target)

> The example makes use of a simple RSI, what about all the effort we put in fine tuning >our indicators?

Good question. I used RSI because most people understand it. And ironically you will find (for this simulation) most indicators will work. That illustrates the power of a neural net. Essentially a neural net can learn most functions if you provide it the variables input to the function, the output you expect from the function and enough examples. An RSI is just a calculation on price, so is stochastics, and the majority of indicators out there. So it's largely irrelevant which indicator you use for the simulation.

>- Does this introduce the paradigm that (in the end) indicators are irrelevant, they all >have the same effect?

Depends on your thinking. To me, the majority of indicators are redundant, unless you are feeding them leading information. There are a few exceptions however, and sometimes you can use a conventional indicator in a non-conventional way. However, neural nets can reproduce almost any indicator you wish. In fact maybe we should do that as an example later, teach a NN to learn RSI. The trick is in understanding the concepts so that you can immediately look at the latest indicator and say, "This wouldn't work", or "This works".

Mark Simpson Bowfort Technologies Inc.

**Re: What needs to be achieved to build a profitable Neural Net?**

Date :7/25/2005 10:17:46 PM Poster : Alan Rhodes

This is one of many places where you completely lose me.

It seems to me that not all indicators are created equal. A true oscillating momentum indicator, since it is the first derivative of the signal, should lead, with the resulting loss of accuracy (Heisenburg at work). Smoothing it by front loading it (Martin Pring's KST) or whatever magic Jurik does should not affect the leading. So one way of reducing lag is by mixing a good oscillator with a lagging but darn close indicator, such as Jurik's.

And now that Neuroshell is acting normal again, I'll be testing that.

**Re: Take 2: What needs to be achieved to build a profitable Neural Net?**

Date :7/19/2005 9:16:35 PM Poster : Mark Simpson

Hi,

Firstly if you're starting off here, please read my earlier postings in this thread first.

Take 2: So let's start off with a theory:

Yesterday you had a eureka moment and designed the perfect indicator, using the inbuilt Neuroshell functionality. You tested the indicator, you'd done everything correctly and hadn't cheated by putting some element of the future into your perfect indicator (lets call it PI).

PI is clever. It tells you in advance when to enter and when to exit a trade. However, it's a bit difficult to eyeball, so you feed it into a neural net and it gets it right 90% of the time, and you know now that you can retire in a year.

Firstly, most of you know by now it's not that simple. So what I'm proposing here is a change in thinking. Conventional thinking produces conventional results, and we know that conventional results don't work. NST is a very powerful platform that can be used

conventionally or unconventionally, and the option is yours. (with many other platforms, you're forced into a conventional approach by the design limitations).

Conventional thinking is that you start off by finding an indicator (maybe out of NST, TASC etc.), and pop it into NST, test a bunch of securities against it, and find some that make money. (then generally after testing it in realtime, you find that it no longer makes money). Even worse, some of the examples that are printed with the magazine etc. show the indicators working, but when we try them in real life, we find they don't signal as well as they should. So back to the drawing board, we now find the next wizzy indicator and try again, and so on. This is how almost every technical analyst using NST (and most other packages) starts, and you could think of it as a right of passage.

So, the question is, what is wrong with the conventional thinking, why doesn't it generally work? Are the indicators broke? Is technical analysis folly? Or is it our thinking?

Are the indicators broke? Not exactly. We know they work, but we also know there's something wrong with most of them. They do exactly what they're supposed to do, but in the process they add lag. And it's the lag that catches us out. Essentially we're late to the party, and we leave late too, all due to lag. So at best, we make a little bit of money on a long trend (because we're late in and late out we don't catch the whole trend), and then we get whipsawed out in sideways motion which generally eats up any profit we made in the trend. Add on transaction costs and we're beat.

Is technical analysis folly? Though people have probably told you before that technical analysis is folly, (hey there was even a few books written about), it's difficult to ignore cause and effect. Essentially price is reflection of a people's actions, i.e. it's an effect.

Cause is the people themselves, each person is an individual, some will look at fundamentals, some technicals, some will be trading weekly, some daily, some intraday. Some will be looking for certain patterns to buy, some will be looking to fake by selling those same patterns. And so on. I.E. It's one complex model. However at certain points in time, things will line up to push price in one direction or another, and at other points, all the individuals are in conflict and price will go sideways.

So which is it better to model, the cause or the effect? Effect lags cause, we know that already. However the inputs we have to our models are price based (i.e. based on the effect). Are we doomed? Can we model the cause?

So what's wrong with our thinking? The process is wrong. To make a profitable model that stands the test of time we really need to start out by figuring out what we are trying to achieve, before figuring out how to achieve it. We know we need to model the cause but we only have the effect to work with (price), and that it lags the cause. So hence this is where the demonstration model posted earlier in this thread comes in.

Lets try that different approach to an explanation:

Back to our Perfect Indicator. So, how do you make one of these "Perfect Indicators"? Well, there's a number of issues that need to be solved first and we will discuss later (if there's enough participation). In reality there are physical limitations which mean you can't get a perfect indicator, but you can get say a "Near Perfect Indicator", and a Near Perfect Indicator could be pretty darned good.

So in the meantime, lets simulate our perfect indicator. This simulation is just that, it's

a cheat, we couldn't use it in realtime. But we're trying to find out what we need to achieve to build it, we're not going to use it to trade anyway. We know that 99% of the indicators out there lag price and that if they didn't we could consistently make money. So lets see how much money we could make, by cheating and leading price. In doing this we can learn some useful things.

We know that lead is the opposite of lag, and we know our indicators have lag, so for the purposes of simulation only (we can't do this in real life), we will lead to counteract the lag inbuilt in the indicators we're using.

So we start off by looking into the future. I.E. We lead price by 1 bar, feed it to RSI and then onto a neural net.

Every trade consists of an entry and exit, therefore we have lead by 1 bar on entry and 1 bar on exit. We run the neural net, and it doesn't lose as much as it did without lead, but we're not making money yet.

So we add another bar of lead onto it, so now we have 2 bars of lead on entry and 2 bars of lead on exit. Total 4 bars. Now we just break over even with transaction costs. Things are good, we know that if we could save a total of 4 bars of lag, we could start making money, which is good enough for most people.

Now we're getting greedy, so we add another bar of lead. We now have 3 bars of lead on entry and 3 bars on exit. Total 6 bars. We run it, and the net makes obscene amounts of money (pity it's only a simulation).

So finally we say, what would happen with 4 bars of lead. (8 in total), and the net performs better than our wildest dreams.

So from this example we have learnt what we need to do to make money. Obviously the hard part is doing it and an indepth understanding about lag is needed. However the simulation is easy to build and demonstrates the concepts.

However, there is one really quick and easy way to get to that "better than breakeven point", which will work even with conventional thinking and conventional indicators. That is setting a target based on entry, or "Targetting Small Amounts, and taking your profits and running".

If you take an entry price, and say at entry, I wish to make 1-2%, i.e. a small amount, but I wish to make that small amount consistently, then at entry, you know your exit point. I.E. If I enter at \$100 I know my exit is at \$102. Because I know the value I'm exiting at, then when it reaches that value, I exit immediately. This is a 0 lag exit (assuming you're in something liquid and have good reaction speeds, or have set an order to exit). It's 0 lag because you know ahead of time when you're getting out. (however it's not leading, because you haven't got there yet :-)

So, now lets see how much lag we've saved from our model. The entry still has 4 bars of lag from the indicator we've been using. However the exit is now 0. We've reduced our 8 bars of lag to 4, extremely easily with no special indicators or anything really clever, it's just a simple concept we've used.

Now for the best part. We have the exits beat, for every additional bar of lag we can save on the entry, will make vast increases to the profit we can reap from the model.

However, reducing those 4 remaining bars is not easy, and the cost to pay is accuracy. So it becomes a trade off. If you save 1 or 2 bars, you haven't reached the theoretical limit, but it would be more than good enough.

If you're a lurker out there, I encourage you to post. Feedback about things understood or not understood can be clarified and we can learn from the contributions of others. One of the problems with what we do is that there are few of our friends/family that understand, and many who are not interested. This is the only place we can get together and talk about techniques for using the product we love. Those that are new, ask for help, those who are experienced, well it's payback time :-). Sunny (who has a lot to share) was reluctant to share his models/indicators because of a lack of response to a model he posted, and Marcel has been doing a sterling job of drumming up activity. (I'll get off my soapbox now :-))

Mark Simpson Bowfort Technologies Inc.

### **Re: Take 2: What needs to be achieved to build a profitable Neural Net?**

Date :7/20/2005 11:51:14 AM Poster : Steve Eberbach

Important quote from last Post:

really need to start out by figuring out what we are trying to achieve, before figuring out how to achieve it. We know we need to model the cause but we only have the effect to work with (price), and that it lags the cause.>

In my opinion, this is the most important factor, based on my experience. I have long used the "Perfect" benchmark: cumulative sum of absolute value of all changes in price close-to-close. I also use the cumulative sum of all changes in the natural log, multiplied by 100. This translates into cumulative return in percentage, with the benefit that up and down movements to the same price result in zero percent cumulative return, while using percent change does not.

But is this what we are really trying to achieve? I would say NO, if constraints added to this "perfect fitness" causes a remainder (part of this perfect gain) to be predictable on a more stable basis out of the training sample set!!!!

For this reason, I have long asked Steve Ward to allow access to the ability of setting constraints to the fitness criteria defined in GeneHunter (which is part of Neuroshell Day Trader Pro) Maybe he could consider this for the next (5.0) release. He might consider a license to GH and interfaceto NST as an addon module, also.

A second important principle, in my experience, is that it is best to achieve a small part of the perfect gain with each simple model, and magnify total gain by combining the simple models, as opposed to trying to get one model to do all the different jobs at once. That dovetails with the quote from Mark. We are trying to achieve consistent out of sample gain, not just gain, and achieve it by combining simpler models each of which works better out of sample because constraints were applied to reduce degrees of freedom and irrelevant noise and direct each model to focus on specific contributions to be combined as a team for more consistent success in trading.

To summarize, the definition of what we are trying to achieve is even more important than the definition of the input data, or how they interact in a system. (whether it is achieving "targets", "fitness", or constraints on them.) That is because we have to start with (define) the desired effect, before we can search for ANY cause!

### **Re: Take 2: What needs to be achieved to build a profitable Neural Net?**

Date :7/21/2005 12:21:51 PM Poster : Marcel  
Mark,

Some thoughts regarding your paragraph: "If you take an entry price, and say at entry, I wish to make 1-2%, i.e. a small amount, but I wish to make that small amount consistently, then at entry, you know your exit point. I.E. If I enter at \$100 I know my exit is at \$102. Because I know the value I'm exiting at, then when it reaches that value, I exit immediately. This is a 0 lag exit (assuming you're in something liquid and have good reaction speeds, or have set an order to exit). It's 0 lag because you know ahead of time when you're getting out. (however it's not leading, because you haven't got there yet :-)"

The above is in my opinion correct only if amended by a few important considerations. Yes, for our exits we can set smaller and more predictive targets. But we know that there are no perfect exits:

a) Mistrades We still incur the risk of entering mistrades, where sooner or later we might have to take our losses. With smaller targets, our protective stops have to be set proportionally closer to our entry price. The probability that these will be hit is higher, and the effect on our performance may be negative too. It's a question of how much drawdown are we prepared to tolerate and how can we minimize it.

b) Type of trend The strengths and duration of the trend that we try to capture with our trade is a determinant factor. In other words, if we sit on the right side of a long and strong move, the few bars of lag for the exit signal may become marginal – in dollar terms much smaller than the missed opportunity of staying in the trend till the end. Where it kills us is with small or sideways price moves. The question here is whether we can develop the capability of determining the type of trend and choose our strategy accordingly.

So, whether our exit is voluntary (set by target = 0 lag), involuntary (triggered by signal = X lag) or stopped out (loss), we may have to discuss whether there are techniques to reduce lags. Next to the entry lag, under certain conditions we may still want to accept an exit lag.

Regards, Marcel

### **Re: Take 2: What needs to be achieved to build a profitable Neural Net?**

Date :7/21/2005 2:53:38 PM Poster : Mark Simpson

>The above is in my opinion correct only if amended by a few important  
>considerations. Yes, for our exits we can set smaller and more predictive >targets.  
But we know that there are no perfect exits: Correct.

>a) Mistrades >We still incur the risk of entering mistrades, where sooner or later we  
might >have to take our losses. Correct.

>With smaller targets, our protective stops have to be set proportionally closer to  
our >entry price. The probability that these will be hit is higher, and the effect on  
our >performance may be negative too. It's a question of how much drawdown are  
we >prepared to tolerate and how can we minimize it.



A conventional approach would suggest that a protective stop should be set less than the target. And stop management is not an area that should be ignored or taken lightly. However another way of looking at stop management is from a risk perspective. Markets are risky, and risk needs to be mitigated. There are various ways of mitigating risk, and not all of them involve using a stop order.

So the question doesn't become what value we should be setting our stop too. It is really about, how risky is our model. I.E. If you had a perfect model that got it right 100% of the time, then you have 0 risk and you could trade with confidence and wouldn't need a stop order. If you have a model that is 50% successful, then you really need to have your stop set to be half your target if you want to make money. (because you have to consider things like slippage, trading costs etc.)

Put another way, we know that 100% isn't realistically achievable, but maybe 80-90% is (based on us getting close to the results we simulated earlier in this post). Would we need a very close stop order, or could we afford to move it out further?

> b) Type of trend > The strengths and duration of the trend that we try to capture with our trade > is a determinant factor. In other words, if we sit on the right side of a long > and strong move, the few bars of lag for the exit signal may become marginal > – in dollar terms much smaller than the missed opportunity of staying in the >trend till the end. Where it kills us is with small or sideways price moves. >The question here is whether we can develop the capability of determining > the type of trend and choose our strategy accordingly. Correct. Many people can make money trend following with lagging entries and exits, provided:

1. The trend continues long enough
2. Their trend detection system detects trend effectively with minimal lag.

But what happens in reality it that they normally get in late on the beginning of the trend, and out late on the end (because their trend detection system has lag).

Sometimes this will wipe out their profits, sometimes they'll make a bit of money. But they normally go ahead and trade the sideways periods (because the trend detection system mistaken trades sideways motion occasionally) which wipes out the money they made on the trend, because when trading sideways they're late on entry/exit, plus there wasn't any longterm trend for them to make money on.

Bottom line is, that a trend is a trend after the fact. Anybody can look at a chart and spot a trend historically. However as price is effect, if you're looking at price to spot the trend, you're going to be late to the party everytime.

So, how would we make a trend following system more effective? By picking a target for exit and avoiding that lag on exit. At least then we're late to the party, but we leave early and don't have to cleanup afterwards. By definition a trend will last a while, and it makes money, so why risk that money by being greedy (and trying to always get out at the top, which really is just folly, because lag gets you). If you know it will last a while, then targetting a small amount that you can be sure to consistantly get is better (in my opinion), than waiting for the big fish for a meal, and starving inbetween meals because we're ignoring the little fish that are swimming past and saying, "Hey, eat me".

>So, whether our exit is voluntary (set by target = 0 lag), involuntary (triggered by > signal = X lag) or stopped out (loss), we may have to discuss whether there > are

techniques to reduce lags. Next to the entry lag, under certain conditions > we may still want to accept an exit lag.

Personally I would want to see 0 lag on entry and 0 lag on exit, because I know with this setup (from the simulation), that we would consistently make money, so I can't see a situation where having lag on entry or exit would benefit us. Logic dictates that we can never achieve 0 lag combined on entry and exit with 100% successful trades. But to reduce that lag, we need to figure out exactly what lag is first (there are in fact multiple sources of lag) which we'll get into later. So I see true 0 lag (on both ends) as a theoretical limit, that we can approach but never reach completely (like infinity).

Regards Mark Simpson Bowfort Technologies Inc.

### **Re: Take 2: What needs to be achieved to build a profitable Neural Net?**

Date :7/23/2005 10:51:47 PM Poster : Steve K

Hi Mark,

I am just getting caught up on the forum posts. Really great stuff you are posting. It got me thinking. The only consistently profitable NN I could build used futures in conjunction with securities data. Basically dumping a bunch of indicators into the NN for the stock and the Futures, then see which ones the GA selected. I think the regression indicators worked well. Kinda crude, brute force approach but it only worked well when the futures were thrown into the mix as a leading indicator

I wonder how many bars of lag ya could remove by using these inputs:

Lag(RSI(Close,N),0)

Lag(RSI(Close,N),1)

Lag(RSI(Close,N),2)

Lag(RSI(Close,N),3)

Lag(RSI(Close,N),4)

along with the same inputs for the NQ contracts and let the NN sort out the correlations.

This would probably work best on shorter time frames where the futures lead is more pronounced. Of course not all stocks move with futures however many do. Also, maintaining the NQ data is tricky cause they expire every 3 mos. A possible substitute could be the compx, the QQQQ or even another stock.

Just a thought, I'll play around with it tomorrow -- but u had some really great ideas, I'll have to read thru them some more -- great thread

Steve K

### **Re: Take 2: What needs to be achieved to build a profitable Neural Net?**

Date :7/25/2005 2:22:21 AM Poster : Mark Simpson

Hi Steve,

Nice to see you back.

>I wonder how many bars of lag ya could remove by using these inputs:

>Lag(RSI(Close,N),0) >Lag(RSI(Close,N),1) >Lag(RSI(Close,N),2)  
>Lag(RSI(Close,N),3) >Lag(RSI(Close,N),4) > >along with the same inputs for  
the NQ contracts and let the NN sort out >the correlations.

Sounds like a plan that would work. You could also use serial correlation of both  
items, or say Z-Score both and do some kind of comparison (in simplest form,  
one minus the other), and then do the TDNN too.

>This would probably work best on shorter time frames where the futures lead is  
> more pronounced. Of course not all stocks move with futures however many  
> do. Also, maintaining the NQ data is tricky cause they expire every 3 mos. >A  
possible substitute could be the compx, the QQQQ or even another stock.

You can also make continuous contracts for futures and options (if your data  
provider doesn't do them for you, many do) out of a number of different series.

Mark Simpson Bowfort Technologies Inc.

**Re: What needs to be achieved to build a profitable Neural Net?**

Date :7/16/2005 5:04:30 PM Poster : John

Marcel,

thank you for leading this initiative. I am hoping this will get me on the right track after  
many false starts and poor models that perform well with historic data but which are  
dreadful going forward.

The issue raised regarding the need for more up to date examples is well made with the  
canned examples having little transferability in either time or to other instruments. I did  
not expect these to be magic bullets but hoped the principles would be a little more  
robust to give me a more confident base on which to build systematically rather than (for  
me) more random trial and error.

In fact systematic model development is for me a critical goal and one this initiative will  
hopefully stimulate - with other's approaches to model building being as important as  
model sharing.

I also need some help. I am having difficulties with the chart you posted - I've done  
something wrong but I am getting too close to the problem to see the solution.

Could you explain how to get the data into the chart. I opened the zip file and fired up  
the chart, NST performed an auto search for the data at my request for each instrument  
and then fired up an abortive e-signal download request for each instrument. The chart  
loads but has no data. I subsequently copied the expanded folder into my NST folder  
and manually selected each of the instruments. Still no joy.

Any guidance would be welcome.

Thanks and regards

John

**Re: What needs to be achieved to build a profitable Neural Net?**

Date :7/18/2005 4:20:15 AM Poster : Marcel

John,

Wrt installing the sample, I believe you have to do the following:

- Unzip the cht-file to a new chart subdirectory

(e.g. NeuroShell Trader 4\chart\ForumSample001)

- Unzip the txt-files to a new data subdirectory

(e.g. NeuroShell Trader 4\data\ForumSample001)

- Start NST, go to Tools -> Data Sources and add the data directory you created above, assigning a Category of your choice

(e.g. Miscellaneous Instruments)

- Now open the chart, if prompted for automatic load, skip it and attach the instruments with Format -> Add/Remove Chart Pages

I however discovered a mistake on my side: The sample I included needs a few Jurik indicators – my apologies for that! I thought to have put this model aside because it was NOT using Jurik's indicators, while it was because it uses the NON detrended JMA function – sorry, lost the overview among too many models...

I'm not sure of what happens if you open the chart without having these add-ons, maybe you can still see the output. I've checked other models I'm using, and it appears I'm too affectionate to Jurik. So, either I create a new model for the purpose of this thread, or someone else can post one to be used as a working sample. I'm however very interested on any comments from those who can analyze my sample above.

Marcel

### **Re: What needs to be achieved to build a profitable Neural Net?**

Date :7/18/2005 11:06:44 AM Poster : Mark Simpson

Here's a quick tip for including the data in the chart itself (assuming you have a recent version of NST).

When you've built you chart, save it, then click on the "Email Chart" menu item in the File menu in NST. It will ask you if you want to include the data in the chart or not. Say yes, then it will pop up an attachment in your email client.

What to do next depends on your email client. If you're not bothered about checking the chart, then just post it direct to the forum email address. If you need to see it and your email client will let you, save the chart attachment (with a different filename). If not, send the message to yourself, then download the attachment when you receive it.

Mark Simpson Bowfort Technologies Inc.

### **Hello !?!**

Date :7/22/2005 2:45:13 PM Poster : Marcel

All,

A few quotes to start:

Sunny: "To summarize, I was disappointed to find the lack of response to what I have found to be a very useful indicator. This lack of response has made me a little bit more thick-skinned when it comes to sharing indicators or systems in the forum."

Josh: "This is a long post, so I'll post again when discussion runs to ratios of "evaluation bars" to "Out of sample bars." I have a theory for determining these I'd like to set up for debunking!"

Sunny: "I like your optimism since this is key for this game. I will be interested in following your work in the days ahead."

Josh: "I am interested in sharing."

John: "thank you for leading this initiative. I am hoping this will get me on the right track after many false starts and poor models that perform well with historic data but which are dreadful going forward."

My dear friends – I haven't been in this forum long enough, my apologies if I'm going to be too direct or hurt somebody.

Right from the start I had the sensation that there is good potential on this board, that there are people (frustrated, motivated, beginners, experts etc) out there willing to share and learn. Since for the time being I can dedicate quite some time to it, I'm perfectly fine to do some extra work, kick off initiatives or write a bit more than average.

Mark is doing a sensational job, in this thread he is the driver and he has led us through the jungle so far. I can't find the right words, but he has my fullest support and admiration, because he is willing to share his knowledge and experience, generously, without fear of "giving away secrets", something that could give others the advantage. And he is very smart too, he does not give away cookies, he explains how to bake them, which is also more interesting and rewarding for him.

Now honestly, apart from two other contributors (many thanks to you too!), the rest is zero, only ephemeral appearances. I'm not here to point finger or teach values, but we have to understand that any discussion is effective only if there is CONTRIBUTION. I have the impression that this thread is mainly a dialogue between Mark and me, and lots of spectators around. This cannot be!

Mark has mentioned it a few times, "if there is enough interest, we are going to explore deeper and deeper". No interest (= no contribution), and this thread will die. Is this what we want?

Looking forward for many new articles. Have a good weekend, Marcel

### **Re: What needs to be achieved to build a profitable Neural Net?**

Date :7/25/2005 10:58:46 PM Poster : Alan Rhodes

Your post brings up something Ward Systems advocates that I feel very uncomfortable using.

Over simplifying, find a trading system that works out of sample for an instrument, and trade that system until it fails.

My discomfort with this is that selecting successful instruments can be a form of over optimization, in my opinion. I do not completely buy into the personality of stocks theory (that different stocks have different personalities and therefore need different trading systems). True, you know certain stocks are going to be hot, and that a volatility based system will be successful. But all hot stocks cool off, and usually you base your decisions on what is cooled off by other factors then just looking at the stocks.

### **Re: What needs to be achieved to build a profitable Neural Net?**

Date :7/26/2005 11:12:18 AM Poster : Mark Simpson

>Your post brings up something Ward Systems advocates that I feel very  
>uncomfortable using.

>Over simplifying, find a trading system that works out of sample for an >instrument,

and trade that system until it fails.

This was an item I was planning on discussing in detail later in the Curve fitting sections, but here's a quick view of it in the meantime.

Curve fitting is generally bad news. If you build a model and then run through 100 stocks trying to find the ones that work, or run through 100 indicators, or genetically optimize (i.e. run through 100's of parameters picking the best ones that work), then they are all forms of curve fitting.

Here's an example to illustrate the issue. If I was to toss a coin 100 different times then each one would either land up heads or tails. And roughly 50% would be heads and 50% would be tails. Now, I want to build my perfect coin tossing system, so I take out all the coins that are heads, and I now know that I have a perfect trading system that will always produce heads. I then start using it out of sample, and it doesn't work.

That's one example. Now, let's do the same thing again. Except, this time, I'm going to make sure it works, by building an out of sample test too. After I've chosen my coins that always produce heads, I then create an out of sample test, where I again select all the coins that produce heads. So now, roughly 25% of my coins are "heads" producers, and I've proved it with an out of sample test too.

The above are examples of curve fitting by selection and rendering your out of sample to be in sample.

Essentially any process where you're selecting something to find the best things that work is curve fitting (in this context), and that is when the alarm bells should ring. The point is that in any population of results, some will do well, and some will do poorly just by chance alone. If you then select just the good ones, then you've chosen something that could have been (and likely was) governed by chance.

So that's the bad news. Now for the good news, how do we successfully use curve fitting.

1. Design a good model first. By designing a good model to start off with, you don't need to curve fit. (beware about trying 100's of models until you find one that works, you're just curve fitting again :- ) ).
1. Curve fit at the end of your design process. I.E. When you have built a working model. By leaving it until the end, you should already have good results, and then the GA is just improving things.
2. Constrain the genetic optimizer. If you're starting with a good model, then the parameters the GA is picking should be constrained to reasonable values. (However if you're starting off with a bad model, and trying to find what works, then you shouldn't be using constraints).
3. Calculate the number of Degrees of Freedom in your model (DOF) - aka variables, and validate the model with 30 trades per degree of freedom. This helps you avoid curve fitting. I.E. The more complex your model, the more trades you need to validate it on.

These 4 reasons are why I advocate designing a good model in a process rather than just trying to find one by repeated experimentation.

Now, back to the technique Ward Systems advocate, is it right or wrong? It's right if you use it correctly, and here's why.

Essentially when you're curve fitting, you're trying to fit, well "A Curve". In this case it's a

complex function. Now if you can see enough of the function, you can approximate it. The more variables you have the easier it is to approximate. The less you have, the more difficult. This is why we need to validate it on sufficient trades, i.e. need to make sure we haven't accidentally curve fitted by having too many variables.

Now lets look at it slightly differently. You can approximate a curve with lines. The smaller the lines, the better the fit you get. As the length of the line approaches zero, you get a perfect fit to the curve out of these little pieces. This is called a piecewise linear approach.

So if you keep the lines small (i.e. by keeping your model simple - DOF small), then you can curve fit by retraining the GA/neural nets often using the piecewise linear approach.

Mark Simpson Bowfort Technologies Inc.

### **Re: What needs to be achieved to build a profitable Neural Net?**

Date :7/26/2005 4:25:34 PM Poster : Marcel

Mark,

Thanks for your elucidation on "curve fitting", from this perspective certain observations become certainties and feelings become facts (relativity – Einstein).

Can we concentrate for a little while on: "1. Design a good model first. By designing a good model to start off with, you don't need to curve fit. (beware about trying 100's of models until you find one that works, you're just curving fitting again :-)."

We have learned from you a few fundamentals for building models, like the effects of lag, the principle of TDNNs, learn ability of NNs etc., but how do we mix it together?

In other words we are learning the ingredients (flour, butter, sugar and eggs), but we don't yet know what to do with it.

And are those sufficient to bake something that tastes like cookies? What other fundamentals are needed to "Design a good model first"?

Maybe there are some more aspects that need to be discussed, like:

- . Definition of the objective of a NN
- . Selection of inputs, what is relevant to achieve the objective
- . Indicators classes, what can be expected from them -Model structures (simple vs. composite structures)
- . Where can Trading Strategies play a role
- . Etc.

Pardon me for being impatient, Marcel

### **Re: What needs to be achieved to build a profitable Neural Net?**

Date :7/26/2005 6:13:11 PM Poster : Mark Simpson

>We have learned from you a few fundamentals for building models, like the >effects of lag, the principle of TDNNs, learn ability of NNs etc., but how do we >mix it together? >In other words we are learning the ingredients (flour, butter, sugar and eggs), >but we don't yet know what to do with it. >And are those sufficient to bake something that tastes like cookies? >What other fundamentals are needed to "Design a good model first"?

Lets stick with the baking analogy for now. So far we've introduced the goal/concept of baking (a model that is profitable). We know that to bake something, we need to build a recipe (a model).

The recipe has an end goal (something good to eat), with 2 possible outcomes, something that tastes good, and something which tastes bad.

So far we've only learnt the basic concept of a recipe. You're still missing the ingredients. After we've gone through the items, hopefully you're going to have a guide to creating recipes, and some of the ingredients (enough to bake cookies), but the type of cookie you decide to bake and the recipe you create will be up to you.

>Maybe there are some more aspects that need to be discussed, like: >- Definition of the objective of a NN I would say to pick something that can be predicted. Is it reasonable to predict price? Or would it be better to predict things that produce cleaner signals, like a turning point? From the demo chart for learning, which kinds of things would you say could be predicted?

>- Selection of inputs, what is relevant to achieve the objective Those are ingredients.

>- Indicators classes, what can be expected from them Classes of ingredients. I.E. You could say wheat flour would be a class of flour, but you could also use rice flour instead in your cookies.

>-Model structures (simple vs. composite structures)

Personally I prefer simple. The more complex they get, the more difficult they become to build, quantify and test. You can use multiple neural nets (composite structure) to build a model (and many people have been successful doing it), however it does introduce another loose form of creating a better ability to curve fit (because each neural net you add has inputs, and all of those contribute to the degrees of Freedom). So you have to increase your out of samples to account for it. Still, it can and does work.

At some point of complexity though, you reach the issue that you need so much data to test, that in the meantime the function you're trying to fit has changed, or you can't get sufficient data.

>Pardon me for being impatient, :-)

I need to be sure before continuing that people are comfortable with the concepts so far. The problem is that with this view of things are built on top of other things, and the subtleties and requirements for certain technique can be missed.

Personally I always find the best way of learning about something is to experiment with it.

So here are some exercises to post results/charts to this forum (prefably from people who haven't posted on these subjects yet).

1. Build a 4(entry) 0(exit) lag chart (using real data, not simulated with lead) and post results.
2. Examples of what inputs and outputs a neural net could learn.
3. An analysis of the amount of noise that can be reasonably rejected by a neural net.

Mark Simpson Bowfort Technologies Inc.



## **Re: What needs to be achieved to build a profitable Neural Net?**

Date :8/3/2005 3:26:03 PM Poster : Marcel

Mark,

> I would say to pick something that can be predicted. > Is it reasonable to predict price? Or would it be better to > predict things that produce cleaner signals, like a turning point?

Technically speaking, to predict price as an absolute value seems the worst of the choices to me, first and foremost for the fact that price is not normalized. The output should be a variable that ranges between two limits, fluctuates above or around a fix value (e.g. zero), or is member of a set of values. Better choices would therefore be a probability (0-100%), a change in percent (+/-) or a direction (up, neutral, down).

In terms of strategy, I think the biggest distinction to be made is between "trend-following" and "counter-trend". Most of the time (around 70%) prices trade in a sideways or "range-bound" pattern. By contrast, markets are only in a "trending" mode for the remaining 30% of the time. In statistical terms, commodity and financial markets display a strong tendency towards mean reversion.

But when prices do trend, those trends are often powerful and sustainable, offering low-risk / high-reward opportunities, such that a single profitable trade will often offset numerous small losses. That's the moves we want to capture with a "trend-following" strategy. On the other hand, a "counter-trend" system will measure the "strength" of a market or instrument with the objective of determining when it becomes either overbought or oversold, taking therefore a contrarian position.

Conventional implementation examples of "trend-following" strategies are based on MA crossovers, while "counter-trend" strategies are for instance conventionally implemented based on Momentum Indicator levels.

> From the demo chart for learning, which kinds of things > would you say could be predicted?

[I assume you are referring to the S&P500 chart]

Well, the very first thing to consider is the dimension of TIME. While one trader may be placing all his tokens on a – from his perspective – big upmove, an investor may observe this same move as a little correction to the mean, being a large downtrend, he will remain short.

In a monthly S&P500 chart, we would therefore observe an established uptrend during the 90's, a correction starting Sept.2000 and lasting roughly 2 years, then the resume of the previous trend.

But since we are working with daily charts, we want to capture those smaller moves that are influenced and at the same time independent from the (monthly) superposed trend. In practical terms, we are prepared to place up to a few trades per month for a particular instrument.

We would ideally be looking for those valleys and peaks, which appear to occur with a frequency of 10-30 bars (days) and that form turning points...

So, are we going to design a “trend-following” or a “counter-trend” system? We get obviously tempted to catch that particular trend-reversal with our “counter-trend” strategy, let the position run by listening to the “trend-following” system, and change direction exactly when the “counter-trend” alarm bell rings!

(Sorry Mark, I’m on purpose not applying what previously discussed with pre-determined exits and 0 lags, only describing the most logical reasoning for solving this problem!)

Can someone else take over now and either correct the reasoning or continue with design considerations?

Best Regards, Marcel

### **Re: What needs to be achieved to build a profitable Neural Net?**

Date :7/26/2005 1:11:17 PM Poster : Mark Simpson

>True, you know certain stocks are going to be hot, and that a volatility based >system will be successful. But all hot stocks cool off, and usually you base >your decisions on what is cooled off by other factors then just looking at the > stocks.

That is a pretty key statement that Alan has made, i.e. "All hot stocks cool off" Conventionally, stocks go through modes of being in vogue and out of vogue, and that breaks models. I.E. A model that has been built for something in vogue, doesn't normally work on something out of vogue and vice versa. It is a major frustration for us and breaks models quicker than you can blink.

So the question becomes, are we using the correct model, or is our thinking suspect?

It's common knowledge that the beginning of the trading day and end has high volume, and the bit inbetween is generally lack luster volume. However, most models don't consider this issue. Sometimes you'll see people suggest, "I've built the model just to trade between 9:30 and 10am", but it makes you wonder why can't the middle of the day be traded too, i.e. what process is in play that means it only works at certain times.

The issue at play here is "Time". If there are no trades/demand, price doesn't change, if there are a lot of trades/demand, price changes. Yet, we routinely change this rate to a constant time base "Clock Time", and then try to analyze it with fixed static techniques i.e. why would an SMA of 21 periods be of any use when the rate of trading is constantly changing?

There are a couple of ways of solving this issue, one is adapting your indicators, the other is adapting your time base to a new one, lets call it "Market Time".

However this is step 4, and we have 2 and 3 to get out of the way first.

So in preparation for 4, I ask you to pull up some intraday charts with volume, and look at the patterns in price at different times of the day and see how they would change if you stretched time in areas of high volume and compressed it in areas of low volume. I encourage people to post their findings, and then we can discuss some ways to achieve that process. (If you don't have NST Pro, then the same exercise can be done with daily bars).

Mark Simpson Bowfort Technologies Inc.

**Re: What needs to be achieved to build a profitable Neural Net?**

Date :7/29/2005 3:31:30 PM Poster : Alan Rhodes

I sent in a chart to not allow this discussion to die, but it shows is what you have already stated, that volume drops off mid day.

I assume you are suggesting that we somehow vary the x-scale in the chart by taking the raw data, pre-processing it and then feeding back into NeuroShell. Be a little patient since so far crude attempts have bombed, but not giving up.

[QQQgenericVolume \(data saved\).cht](#)

On 7/26/2005 1:11:17 PM Mark Simpson wrote: >True, you know certain stocks are going to be hot, and that a volatility based >system will be successful. But all hot stocks cool off, and usually you base >your decisions on what is cooled off by other factors then just looking at the > stocks.

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Mark Simpson Bowfort Technologies Inc.

**Re: What needs to be achieved to build a profitable Neural Net?**

Date :7/26/2005 3:30:18 PM Poster : Marcel

Alan,

I was working intensively with NNs and trading strategies beginning/mid 90's, but gave eventually up because of immature technology (my perspective). At that time, 90% of my efforts were devoted in building the necessary tools, which means developing the NNs, the feeds, the GUIs, reports etc. Little to no time was left to focus on models, especially when learning processes were taking >12 hours to complete.

10 years later I'm taking a second chance – I hope I can learn to drive without having to build the car, this time. I only (re-)started 3 month ago, and although I may not be considered an early beginner anymore, I still have lots to learn. I have gone through several “experiments”, all of which were based on the few methodologies documented in the context of NST. Neither satisfied with the approach nor happy with my results, I've tried to facilitate a few discussions on this forum, seeking for answers.

My introduction above is not meant to state the “perfect process”, it's simply to document the way I, and probably many other users of NST, are (soon were) developing systems with NST. And it's also to kick off the discussions on the matter. But I'm grateful for your candid comment – it confirms my observations and fears. So let's push this project further on!

Regards, Marcel

**A dynamic volatility-trailing stop**

Date :7/15/2005 7:35:34 AM Poster : reyden

The current trailing-stops are either price or percentage based, in other words fixed. I'm interested trailing-stop, related in a percentage, but the percentage is a function of the stocks volatility over the last 90 days, in other words the trailing stop dynamically changes over time. Any tips will be appreciated.

Thanks

**Re: A dynamic volatility-trailing stop**

Date :7/17/2005 12:45:29 PM Poster : Matt Jarvis You really aren't limited to the canned trailing stops that NSTP provides. You can create your own price level. Your first step should be to determine how you want to measure the volatility and compute the percentage function. My thought would be to use the standard deviation of the price or momentum ? Matt

**Re: A dynamic volatility-trailing stop**

Date :7/17/2005 4:13:48 PM Poster : Alan Rhodes

You may want to take a look at Kirshenbaum Bands and see if you can use them. Admittedly they are not the perfect solution for what you want to do, but they may come close enough so that you can adapt them without custom programming. You can download them for free at the Bowfort Technologies web site

**Cybernetic Analisis Add-on -Does it meet expectations?**

Date :7/20/2005 5:19:03 PM Poster : Toni I am considering purchasing the Cybernetic Add-on. I've ordered the book hoping that it will give me a good indication on whether the Add-on will meet my requirements -but the book is still in transit (Post)..... so the question really is whether someone has used this add-on and found it to meet trading expectations? What is your experience with it?

**Re: Cybernetic Analisis Add-on -Does it meet expectations?**

Date :7/22/2005 4:41:40 PM Poster : Maxwell Craven

I have the add-on and have found it very good. Of course, not all indicator sets have worked for me, and I haven't tried all of them, but the following have been financially beneficial so far:

Cyber cycle and trigger Itrend and trigger Stochastic RSI & RVI relative vigor

**Re: Cybernetic Analisis Add-on -Does it meet expectations?**

Date :7/25/2005 4:38:19 PM Poster : Ward.net Webmaster

The August issue of Technical Analysis of Stocks and Commodities (out now) has an article about the Cybernetic add-on. Look on p48 for the article called "Turbocharge it"

## What neural networks can learn, and what they can't learn

Date :7/22/2005 1:14:51 PM Poster : Mark Simpson

Onto the next phase:

Firstly for purposes of these examples, I've created a Sine Wave Indicator. This essentially just displays a sine wave, but here's the breakdown on the indicator so you can see how it's created. For ease of use, I've created it as a template file you can install into Neuroshell.

To create the sine wave indicator, first of all, we take:

```
CumSum(Constant value(1),0)
```

This creates a ramp which increases by 1 for each additional bar. It changes by 360 over 360 bars.

We then need to allow the ability to change the length of the sine wave, to do this we take the CumSum expression above and multiply by 360/periods, where periods is the length of one cycle of the sine wave, giving:

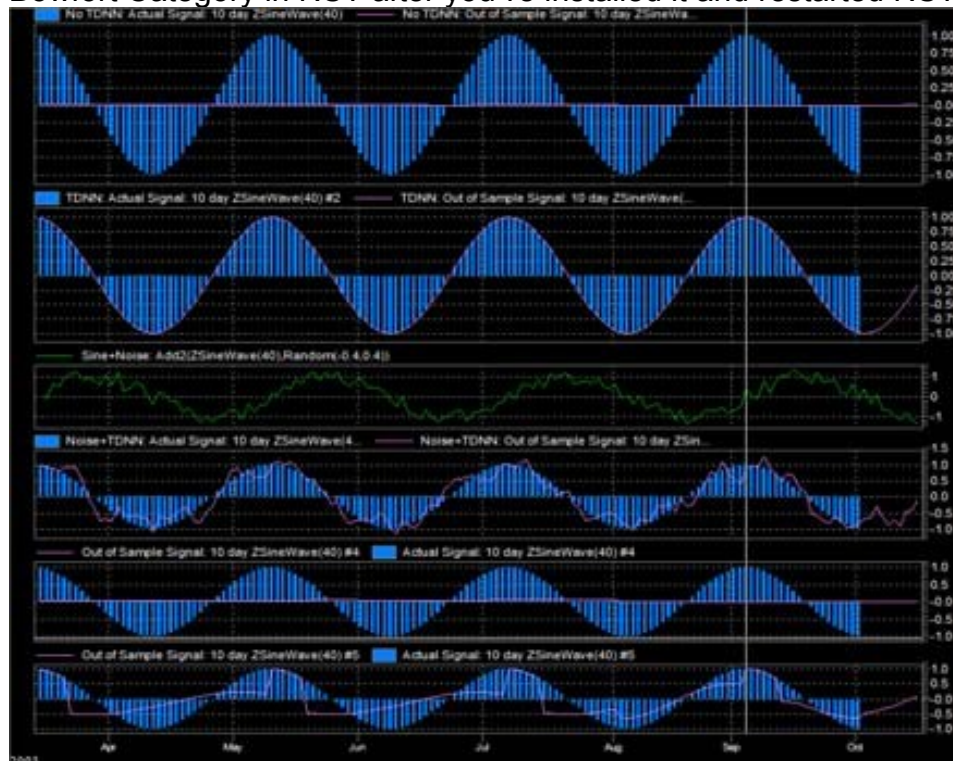
```
Mul2(CumSum(Constant value(1),0), Divide(360,periods))
```

This creates a scaled ramp function.

Then we take the Sine of it and we have a sine waveform:

```
Sin(degrees)(Mul2(CumSum(Constant value(1),0),Divide(360,periods)))
```

I've saved this as a template file that you can install into Neuroshell, and takes one parameter (periods). The indicator is called ZSineWave and can be found in the Bowfort Category in NST after you've installed it and restarted NST.



[Learning.zip](#)

To see this example, download the above and put ZSineWave.tpl in your Template folder in your Neuroshell folder (or Neuroshell Trader 4, or whatever else you've named

it). The chart goes in the Charts folder.

The example demonstrates how a neural network learns effectively (or doesn't), depending on the quality and techniques used to feed it.

The first subchart demonstrates a neural network predicting a 40 period sine 10 days in advance. It's input is just a 40 period sine wave. As you can see the prediction (the magenta line) is terrible. Correlation is -0.0203. Why is it so bad? Lack of context.

The 2nd subchart adds that context. It's the same chart as the first, but just implements a TDNN this time. This time we get a correlation of 1. The neural net is perfectly predicting. (as an exercise you can try removing the lags, so you only have the ZSineWave, and just one Lag(ZSineWave,1)).

The 3rd subchart shows random noise ranging up to 40% of the sinewave being added to the sine wave. I.E. We're deliberately degrading the ZSineWave with random noise. This is used in the 4th subchart and is here for reference purposes.

The 4th subchart is the same as the 2nd subchart (i.e. with TDNN), however, the sine wave is not clean, we've added noise to see how well the net can deal with this issue. However we're still trying to predict that perfect sine wave 10 days in advance. Correlation is still good at 0.935, i.e. the net has managed to deal with most of the noise. However there is some degradation. Try experimenting with the quantity of noise and see the effect on the quality of the neural net output.

The 5th subchart puts a Cumulative Sum into the neural net as input, instead of a sine wave. However it still is trying to predict the sine wave 10 periods ahead. As you can see, the net does poorly on this example. Correlation is 0.0656. Why? Didn't we say earlier that a neural net can reproduce a function, so why should it need sine as input, can't it figure it out itself.

The answer is it can, however, we've done something wrong. It's all about seeing similar data in realtime as it does during learning. Cumulative sum is monotonically increasing, i.e. the neural net will never see the same (or similar value) again on its input, so it never learns.

The 6th subchart fixes subchart 5, very simply. We take the same cumulative sum, divide it by 40 and use the remainder of this calculation as input. I.E. We've changed the input to be a re-occurring ramp of 40 periods instead of just a continuously increasing ramp. I.E. The net sees data that it's seen before, so it can learn. Correlation is 0.726, not perfect, but it's obviously learning the function. I leave it as an exercise to see how you can improve that correlation.

The above serves as a simple experimentation platform on what neural networks can/can't learn.

Incidentally, if your fingers are aching from building TDNN's, a quick tip for inputting, is when you create the "Lag" indicator, where it has periods, put in 1,2,3,4,5 instead of say "1" and it will create 5 indicators. This is a shortcut in NST which enables you to create multiple indicators with different parameters, and it saves you having to do the same thing 5 times.

In Summary, to predict effectively:

1. You need to have minimal noise.
2. You need to have something that can be predicted.
3. A neural network needs context. If you're not providing it with your indicators, then



- you need to provide it using another method.
4. You need to provide data that it has seen before (or similar) for it to learn.

Mark Simpson Bowfort Technologies Inc.

**Missing CustomInd.dll**

Date :7/24/2005 6:18:06 AM Poster : Marcel

Mark

After installing the 2 files as indicated, I get the following msg while opening the chart: "NST was unable to find CustomInd.dll. Pls contact the solution provider..." This looks to be the dll that contains the SineWave function, since no Sine actual signal is displayed on the chart...

Where can we download it from?

Tks & Rgds, Marcel

**Re: Missing CustomInd.dll**

Date :7/25/2005 2:08:15 AM Poster : Mark Simpson

Hi Marcel,

There's isn't a missing dll that's needed. I've also checked the chart to make sure there isn't anything I've accidentally left in there, and I couldn't find anything.

The ZSineWave function is constructed from the standard indicators available in neuroshell (CustomInd.dll).

However, if you somehow managed to delete customInd.dll, or some of the indicators in it, or had an older version of NST which didn't have those indicators in, then the ZSineWave might refuse to work.

Please check you have the indicators it was built out of in your list of indicators in NST, i.e.:

Sin(degrees) Mul2 CumSum Constant value Divide

Failing that, what version of NST are you using? Also, is it Neuroshell Trader, or Neuroshell Trader Pro?

Can anybody else confirm success or not opening the chart? In which case, is it Trader or Pro, and what's the version?

Thanks

Regards

Mark Simpson

Bowfort Technologies Inc.

**Re: Missing CustomInd.dll**

Date :7/25/2005 8:38:43 AM Poster : Ward.net Webmaster

Customind.dll is from Advanced Indicator set 1.

**Re: Missing CustomInd.dll**

Date :7/25/2005 8:54:30 AM Poster : Marcel

Well, this explains it - I don't have the Advanced Indicator set 1 Add-on...

**Re: Missing CustomInd.dll**

Date :7/25/2005 10:09:50 AM Poster : Ward.net Webmaster

No problem. Mark is using the Constant Value indicator, which is in Adv Ind Set 1. However, Constant Value(1) can also be made with Add2(0,1). Same thing.

**Re: Missing CustomInd.dll**

Date :7/25/2005 10:55:16 AM Poster : Marcel

Sorry, but I think that there are more functions Mark is using. Since there is no Sine Wave displayed on the first chart, I believe we are missing Sin()...

**Re: Missing CustomInd.dll**

Date :7/25/2005 12:07:45 PM Poster : Mark Simpson

Thanks.

I've replaced all the "Constant Value"s with Add2(0,1) and rebuilt the chart.

If you don't have Advanced Indicators Set 1, please delete the ZSineWave.tpl file in the Template folder, and then save this chart over the old one in the Charts folder. When you open it, it should tell you that it's recreated ZSineWave and everything should work for you.

[LearningNoAI1.zip](#)

Mark Simpson Bowfort Technologies Inc.

**Re: Missing CustomInd.dll**

Date :7/26/2005 2:19:49 AM Poster : Marcel

Mark,

I confirm that the chart is now working fine. Thanks a lot!

Rgds, Marcel

**Re: What neural networks can learn, and what they can't learn**

Date :7/27/2005 1:26:45 PM Poster : Marcel

Mark,

I finally had some time to go through your instructive example.

Here my comments:

> (2nd subchart) As an exercise you can try removing > the lags,so you only have the ZSineWave, and just > one Lag(ZSineWave,1)

Well, for those who haven't tried (it only takes 1 minute), it's interesting to see that by removing one lag after another, the correlation remains always at 1. In other words, one single lagged input is sufficient to perfectly predict.

Now the interesting part:

a) It doesn't matter if you lag this second (delayed) input by 1, 2 or 5 bars, the correlation remains always at 1.

b) A lag of 0 bars obviously won't work, since both inputs provide the same value. ->  $\text{Lag}(x;0) = x$

c) But what with a lag of 40? Easy, you may say, it won't work neither since the second input delayed by the Sine period will provide the same value as the first input. ->  $\text{Lag}(x;\text{period}*N) = x$  But surprise, surprise! You try and you will see that the correlation is still 1... Why?

d) By displaying the values we find that:  $\text{ZSinWave}(40) = -0.15607$   
 $\text{Lag}(\text{ZSinWave}(40);0) = -0.15607$  (same)  $\text{Lag}(\text{ZSinWave}(40);40) = -0.1560753$  (slightly higher)  $\text{Lag}(\text{ZSinWave}(40);80) = -0.1560805$  (more higher) Alright, a calculation error of the ZSinWave function (a typedef or rounding issue I guess). The curious deduction is that thanks to the little rounding discrepancy between the 2 inputs, the NN becomes capable of perfectly predict!!

> (4th subchart) Try experimenting with the quantity of > noise and see the effect on the quality of the neural net output Here some results: a) Varying the noise level

[Graph20050728a.JPG](#)

As shown by the above graph, the predictability of the NN drastically decreases as more and more noise is added to the Sine. Note that values of noise >100% make little sense, the NN is starting to predict noise.

b) Varying the number of inputs

[Graph20050728b.JPG](#)

As expected, the more inputs, the better the predictability (correlation). To achieve values of  $\text{Corr}(i) > 0.8$ , we need a minimum of 5 inputs (current + 4 delayed) – unfortunately at the expense of more DoF. The above figures apply for a noise level of 40%.

> (6th subchart) I leave it as an exercise to > see how you can improve that correlation.

By analogy to the previous examples, I started to add additional lagged inputs. It can be observed that the NN starts to perfectly predict parts of the wave (to be precise the beginning of the period), while the rest remains still unmatched. This makes sense, since the NN gets inputs (current plus N lagged values) for this particular sector of the wave. So we add more and more lagged inputs...

We don't need 40 inputs (period of 40) to get a  $\text{Corr}(i)$  of 1, for example current value plus a sequence of 22 lagged inputs is sufficient. But we know that such a high number of inputs is negative in terms of DoFs, we get therefore tempted to delete a few of them. The sequence (0; 5; 10; 15; 20) provides a respectable  $\text{Corr}(i)$  of 0.979, which is really good already. But we are cheating a bit (Mark will say curve fitting), since we are knowledgeable about the period being 40 bars – what if the period is only 15, then 60, then variable???

I'm curious to know how others did this...

Now to the usual few questions:

> 1. You need to have minimal noise. Am I correct that we will discuss this under "filters"?

> 3. A neural network needs context. If you're > not providing it with your indicators, then you > need to provide it using another method. What do you mean by "another method" – in practical terms?

Best regards, Marcel

**Re: What neural networks can learn, and what they can't learn**

Date :7/30/2005 4:33:12 PM Poster : Mark Simpson

>a) It doesn't matter if you lag this second (delayed) input by 1, 2 or 5 bars, the correlation remains always at 1.

Correct. Sine is a pretty easy function for a neural net to handle so, 2 inputs are not a problem. More complicated functions can require more inputs to model with a TDNN

>b) A lag of 0 bars obviously won't work, since both inputs provide the same value.

>-> Lag(x;0) = x

>d) By displaying the values we find that: >ZSinWave(40) = -0.15607

>Lag(ZSinWave(40);0) = -0.15607 (same) >Lag(ZSinWave(40);40) = -0.1560753

(slightly higher) >Lag(ZSinWave(40);80) = -0.1560805 (more higher) >Alright, a calculation error of the ZSinWave function (a typedef or rounding issue >I guess).

>The curious deduction is that thanks to the little rounding discrepancy between > the 2 inputs, >the NN becomes capable of perfectly predict!!

Essentially a neuron with one input only has one weight in it's construction, so is limited in the functions it can represent (but that can also depend on the network behind it). A neuron with 2 inputs, has 2 weights, so it can represent more complex functions.

Now if ZSineWave(40) = Lag(ZSineWave(40),40), which it should do, then both inputs are the same, therefore both weights in the neurons should be adjusted to the same value, so it can't approximate the complex function.

So therorectially if you use ZSineWave(40) and Lag(ZSineWave(40),40) as inputs you should get the same correlation as using ZSineWave(40).

However, they're not equal, they're very slightly different. I think the reason for this is a rounding issue in sine calculation. E.G.:

Sine(89) = 0.9998477 Sine(449) = 0.9998476

449 is 360 degrees + 89 degrees. So the result should be the same.

However in programming languages, sine can be constructed using a few techniques, and it might be an artifact of the technique used for sine of the lanaguage NST's indicators are written in.

That's my guess.

>As shown by the above graph, the predictability of the NN drastically >decreases as more and more noise is added to the Sine. Note that values >of noise >100% make little sense, the NN is starting to predict noise.

Nice work. And you hit it spot on. If you give an NN noise, it will learn to predict noise (and of course if it's truely random noise, then you won't get far).

>b) Varying the number of inputs

>Graph20050728b.JPG

>As expected, the more inputs, the better the predictability >(correlation). To achieve

values of  $\text{Corr}(i) > 0.8$ , we need a minimum of 5 inputs (current + 4 delayed) – unfortunately at the expense of more DoF. The above figures apply for a noise level of 40%.

Again, superb work. You can see from the graph that at a certain level, the extra DOF aren't worth the smaller improvements in correlation.

(6th subchart) I leave it as an exercise to see how you can improve that correlation.

By analogy to the previous examples, I started to add additional lagged inputs. It can be observed that the NN starts to perfectly predict parts of the wave (to be precise the beginning of the period), while the rest remains still unmatched. This makes sense, since the NN gets inputs (current plus N lagged values) for this particular sector of the wave. So we add more and more lagged inputs...

This is because the neural network has to learn a function that is varying. Essentially sometimes the values are close together, sometimes they're far apart. You'll often notice that far apart conveys more information to a net. Or another way of thinking about it is correlation of inputs. If 2 inputs are highly correlated, then you really only have 1 input. So really the net is just working off 1 input, and we know from above that 1 input doesn't work in this context.

So when you have inputs 0.1, 0.5 it'll predict well. And when you have inputs 0.997, 1.0 it'll predict poorly.

We don't need 40 inputs (period of 40) to get a  $\text{Corr}(i)$  of 1, for example current value plus a sequence of 22 lagged inputs is sufficient. But we know that such a high number of inputs is negative in terms of DoFs, we get therefore tempted to delete a few of them. 22 lagged inputs covers half a cycle of the wave. Half a cycle gives the neural net enough to learn successfully, because half the cycle can be mirror'd to produce the other half.

The sequence (0; 5; 10; 15; 20) provides a respectable  $\text{Corr}(i)$  of 0.979, which is really good already.

Correct. This is because all 5 inputs have different values (are uncorrelated). And they always will be uncorrelated.

But we are cheating a bit (Mark will say curve fitting),

I wouldn't call that cheating personally. You know your data and that's good. Provided the relationship is there in time, i.e. data 20 periods ago has a relationship to now (which it does for the sine wave), then that's fine to do that.

since we are knowledgeable about the period being 40 bars – what if the period is only 15, then 60, then variable???

Try it out. What I believe you'll find is that provided your cycle length isn't too long and isn't too short, i.e. you're getting different enough samples and good coverage, it will work for many different periods.

As far as variable periods (I'm assuming you mean varying through time). That would be interesting. Essentially the neural net could have a hard time learning. But you could always build an indicator to measure the length of the cycle and feed that in as one of the inputs.

> 1. You need to have minimal noise. >Am I correct that we will discuss this under "filters"?

Yes. Essentially a filter removes noise and gets to the underlying signal. However, the catch is it adds lag, and we don't want that either. But we'll get into all of that in filters.

> 3. A neural network needs context. If you're > not providing it with your indicators, then you > need to provide it using another method. >What do you mean by "another method" – in practical terms?

Say you had RSI, and you wanted to detect a peak in RSI, you'd need 3 inputs to the net i.e.:

RSI Lag(RSI,1) Lag(RSI,2)

then you could train a net to recognise peaks. That's context with a TDNN.

Now for the other method, we could provide context in an indicator itself, i.e.

And2(Lag(RSI,1)>Lag(RSI,2), Lag(RSI,1)>RSI)

This indicator would output a 1 when RSI peaked. Then you would feed this indicator as 1 input to the neural. I.E. The indicator has context. Another example would be the candlestick patterns in NST.

Thats great work Marcel. You have a knack for testing things out, and analysing them completely.

Mark Simpson Bowfort Technologies Inc.

### **Re: What neural networks can learn, and what they can't learn**

Date :8/3/2005 11:29:19 AM Poster : Marcel

All,

This is for the records and to close off this thread:

>> since we are knowledgeable about the period being 40 bars >> – what if the period is only 15, then 60, then variable???? > Try it out. What I believe you'll find is that provided your cycle > length isn't too long and isn't too short, i.e. you're getting different > enough samples and good coverage, it will work for many different > periods.

a) Period of 15 bars

I was personally surprised with this one! Using subchart 6 which has 1 single input  $\text{Remainder}(\text{CumSum}(\text{Add2}(0;1);0);15)$ , the NN performs almost to perfection with a Correlation(r) of 0.998 – no need to add lagged inputs.

I got the impression that the time series is apparently simple enough to be learned "by heart" (= by value). This led me to the assumption that more hidden neurons

would help the NN to learn “by heart” also a period of 40 bars. False, changing the wizard parameter has absolutely no effect. Any better interpretation?

b) Period of 60 bars

Not much to add here, 60 bars are simply a bit tougher to learn, but good results can be achieved with 1 current + 4 lagged inputs (E.g. sequence (0;3;7;17;29) produces  $\text{corr}(r)$  of 0.969).

c) Variable Sine Wave

[LearningTake2 \(data saved\).zip](#)

For this simulation, I've created 3 time series:

- . SinAM: An Amplitude-Modulated sine wave
- . SinPM: A Phase-Modulated sine wave
- . SinAPM: A sin wave modulated in both, Amplitude and Phase

c1) The 1st prediction

Subchart 2 implements a TDNN with 1 current + 9 lagged input (sequence 1;2;3;5;7;11;13;17;23) – in my opinion pretty costly in terms of DoFs, but it's only for the purpose of this example.

-SinAM: Can easily be perfectly predicted ( $\text{Corr}(r)$  of 1.000) also with much less inputs. It seems that changes in amplitude do not present a big challenge for the NN.

- SinPM: In this example we achieve a  $\text{Corr}(r)$  of 0.731. Changes in Phase appear to be a much tougher task for the NN. This can be linked to a discussion we briefly touched earlier on ([http://www.ward.net/cgi-bin/Forum/Forum\\_Article.asp?a=2568](http://www.ward.net/cgi-bin/Forum/Forum_Article.asp?a=2568)) regarding time compression, that's essentially what happens at higher frequency. I haven't yet used any adaptive techniques, I guess we will introduce them when discussing indicator classes.

-SinAPM: With a  $\text{Corr}(r)$  of 0.801 somewhere between the other two. While the predicted signal seems to follow well low frequency phases (slightly lagged one may observe), it gets out of synch when abruptly moving between extremes at high frequency.

c2) The 2nd prediction

Subchart 3 is simply to introduce the first derivative as an input. With only 2 inputs we achieve remarkable  $\text{Corr}(r)$  levels of 0.986, 0.675 and 0.684 respectively.

Feel free to find more efficient ways to feed the NN – hopefully you post the results in this forum...

Best Regards, Marcel

### **Re: What neural networks can learn, and what they can't learn**

Date :8/9/2005 5:12:01 AM Poster : Mark Simpson

On 8/3/2005 11:29:19 AM Marcel wrote: >a) Period of 15 bars

>I was personally surprised with this one! Using subchart 6 which has 1 single  
>input Remainder(CumSum(Add2(0;1);0);15), the NN performs almost to  
>perfection with a Correlation(r) of 0.998 – no need to add lagged inputs.

>I got the impression that the time series is apparently simple enough to be  
>learned "by heart" (= by value). This led me to the assumption that more  
>hidden neurons would help the NN to learn "by heart" also a period of 40 bars.  
>False, changing the wizard parameter has absolutely no effect. Any better  
>interpretation? If 15 integers, i.e. 0,1,2,3,4,5,6,7,8,9,10,11,12,13,14 can be  
memorized by the NN to provide an output of 15 sine values. Then, to memorize  
a 40 period sine wave, you'd need 40 integers. (I believe), i.e. 15 integers to  
memorize a 40 period sine wave wouldn't work.

>- SinAM: Can easily be perfectly predicted (Corr(r) of 1.000) also with much >  
less inputs. It seems that changes in amplitude do not present a big challenge >  
for the NN. Correct. This is because really it's just a function of 2 sine waves. As  
a NN learns functions, it's unaware of what goes into a function, therefore a  
complex function invariably is no more difficult to learn than a simple one. I.E. It's  
function imitating machine.

>- SinPM: In this example we achieve a Corr(r) of 0.731. Changes in Phase  
>appear to be a much tougher task for the NN. This can be linked to a  
>discussion we briefly >touched earlier on  
>(http://www.ward.net/cgi-bin/Forum/Forum\_Article.asp?a=2568) regarding  
>time compression, that's essentially what happens at higher frequency. I  
>haven't yet used any adaptive techniques, I guess we will introduce them  
>when discussing indicator classes. Yes, adaptive indicators are one answer to  
this. Infact what you need is some phase measurement indicator that you would  
add as one of the inputs, then I would expect the correlation to be back near 1.  
Essentially the neural net doesn't have enough information without it. There are a  
few ways of getting this one to work when we get into time normalization. In the  
meantime some of Ehlers cycle length indicators would work as that additional  
input in this case.

>- SinAPM: With a Corr(r) of 0.801 somewhere between the other two. >While  
the predicted signal seems to follow well low frequency phases >(slightly lagged  
one may observe), it gets out of synch when abruptly >moving between  
extremes at high frequency. Correct, because it's a half way house, you get part  
of some results and part of others.

Mark Simpson Bowfort Technologies Inc.



### **The paradox**

Date :7/25/2005 7:50:23 PM Poster : Alan Rhodes

I will start with the assumption that the one common trait of the "New Market Wizards" is that they were either all doing something that nobody else had ever done before, or doing it differently (my interpretation).

I plan on periodically reviewing the posts and capturing what is said in a summary document. That way we have one central document that contains all thoughts as we approach the mindset needed to do things differently.

It was my discussions with Marc Simpson that got me thinking about things differently, and he already shared what he told me.

The paradox is that the wide open discussions that will ultimately lead to something different that works has the potential to open it up to the world, in which case it will no longer be different.

Side note #1 - If you do not hear from me for a while, it is because I am on a forest fire. The next time I go I expect to be gone all August.

Side note #2 - NeuroShell is back to acting normal on my computer.

### **Re: The paradox**

Date :7/26/2005 10:20:54 AM Poster : Mark Simpson

>The paradox is that the wide open discussions that will ultimately lead to >something different that works has the potential to open it up to the world, >in which case it will no longer be different.

That's a very good point, and is why I'm not providing pre-baked cookies (as Marcel says). If I did, the cookie would be soon eaten and there would be no more. By learning how to build our own cookies, everybody ends up with a different cookie. Sure they may have flour, butter, sugar and eggs in, but they're all different.

Also, if you can't bake cookies yourself, then you're always reliant on someone else to bake them for you. In terms of longevity, this is a risky situation to be in, in my opinion.

However, I don't claim to have all the answers either. I've been on this journey for a while, as most of you have, and I've picked up a few things along the way. That's why I encourage other people to share the information they've picked up too.

The Cookie Monster Bowfort Technologies Inc.

### **Re: The paradox**

Date :7/26/2005 2:30:14 PM Poster : Marcel

Alan,

First of all welcome as an active contributor, I'm sure I'm not the only one appreciating it.

I fully subscribe to the summary document. In fact I was planning to draft it last weekend, but I'm more than happy that someone else was quicker than me.

With reference to "baking the cookies", I hope this document can contain the most important recipes to build a successful system. Well, it won't be that simple:

Everybody can bake with the help of a recipe, while the document produced herein will only be useful for those who have followed the discussion and its evolution.

For me one of the most important statements made so far from Mark is

([http://www.ward.net/cgi-bin/Forum/Forum\\_Article.asp?a=2540](http://www.ward.net/cgi-bin/Forum/Forum_Article.asp?a=2540)): "The issue for a lot of

people (me included when I started off) was that I didn't truly understand what a neural net was doing. I treated it as a magical black box, which did things that were truly wonderful, but I wasn't sure how :-). Now I regard NN's as being dumb functional estimators that depend on clean data with a relationship being fed to them. Essentially you have to do the leg work first with the inputs/outputs you're providing. If there is a function there, the neural net will find it, and the clever part is that it saves you having to figure out the relationship. But the relationship MUST be there first."

The above very well documents the paradigm shift from experimentalist (when you build systems based on trial and error) to methodist (when you emphasize on and apply systematic procedures).

Is this maybe what you refer with "It was my discussions with Marc Simpson that got me thinking about things differently, and he already shared what he told me."?

Regards, Marcel

### **Re: The paradox**

Date :7/28/2005 2:27:13 PM Poster : Alan RHodes

Actually Marc made me run through the S&P experiment which taught me two things. First, the magic number 4. That reminded me about the 4 period lag in the Hilbert transform, and I realized that 4 is a relatively fixed number. Until then I assumed lag varied.

The second thing was the importance of context. I plugged a moving average into the S&P experiment: (MA, Lead(MA),1 Lead(MA),2 etc. I found it totally not predictive of anything, no matter how much lead I gave. I needed a MACD to work. That taught me the importance of context and got me thinking about that more.

Most important, he caught me at a time when I realized my project plan based on the yellow brick road was not going to work. I started to wonder if it was possible to do things differently, and he convinced me that it was possible.

One of my jobs has been and starting again is a project manager. Since in the systems design business we are sometimes doing things that have never been done before, often times there is a "figuring out what we need to know" phase, "figuring out how to do what we need to do" phase, and a "doing it" phase.

Ideally what I would like to see is a project plan that evolves over time that ultimately tracks all lessons learned and does ultimately leads to a very profitable trading system. The lessons learned becomes critical as part of the continuing quality improvement.

As the document evolves though, it will reach a point where I will not want it posted on a public forum like this.

And I have to confess, besides needing to be organized, I need something like working on a project plan so I do not feel overwhelmed. I was already learning two new software packages at work (Nessus - our security software and SMS - our configuration management software). Yesterday I started learning Microsoft Project. Though relatively easy, I started to feel totally overwhelmed. I was not excited about coming home, tackling studying my friends work, figuring out the experiment Marc posted with the sine wave, and figuring out what Marc is doing with some other work. The way to deal with those feelings is to have somebody to

talk to and help organize your thoughts and feeling like a team.

It gets back to what motivates me. I guess I have a dream of retiring, trading six months a year, fighting forest fires 2-3 months a year, and spending the money I earn trading and fighting forest fires the other 3 months. Also I love talking about this stuff and experimenting. Flip side, I totally hate reading about the math. My daughter was tested for reading disabilities and the person said it was obvious from my speech patterns that she inherited it from me. But what makes awful at reading math makes me good at things as meeting facilitation. And I have been often told I am a great math teacher. And when I got my BS in computer science, everybody wanted me as a study partner since I helped organize their thoughts from what they read in the book.

I am home on a/l waiting for bark dust to be delivered, and I need to figure out why they are late. Catch you later.

### **Re: The paradox**

Date :7/30/2005 4:36:45 PM Poster : Mark Simpson

>Actually Marc made me run through the S&P experiment which taught >me two things. First, the magic number 4. That reminded me about >the 4 period lag in the Hilbert transform, and I realized that 4 >is a relatively fixed number. Until then I assumed lag varied.

It does vary. 4 is about the lowest you can get away with an amount of minimum amount of smoothing that can produce money (taking into account normal trading factors). I tend to focus on this value because I want minimum lag but enough of a signal to be useful.

I.E. If you're smoothing 2 periods, then you have 1 bar (approx of lag), but the signal is so active that it's no use.

If you say took an SMA of 100 periods, then the lag would be very appreciable.

A good ball park is that with conventional indicators, lag varies from 0.5 -0.25 times the length of the indicator.

>The second thing was the importance of context. I plugged a moving average into >the S&P experiment: (MA, Lead(MA),1 Lead(MA),2 etc. I found it totally not >predictive of anything, no matter how much lead I gave. I needed a MACD to >work. That taught me the importance of context and got me thinking about that more.

This is because price is a value that changes, i.e. over time (unless you're learning on purely sideways motion), then the neural net will see data that is nothing like what it trained on, therefore learning is tough. As an SMA is just a smoothing on price, it's the same result.

MACD on the other hand is repeating. I.E. It's centered around zero, and maintains roughly the same range throughout the data series. So the neural net can learn.

>a. Wavelets – I have barely touched the surface on this, and I doubt I >will be able to without custom programming (frequency and amplitude all >have meaning, and I cannot look at trends without programming). I can >predict major moves with Wavefin, but I cannot predict which way they will go.

Direction is not an issue, you can always make volatility based trades with options. I.E. If you buy a call or a put at the same time, then if the move is large enough, then one becomes worthless and the other one adds value. Option trades are obviously risky though and it's recommend to take an options course first if it's new to you.

Incidentally, volatility is inherently easier to predict in general than price. If you have a system that predicts price correctly 60% of the time, I would say that predicting volatility would be correct 80% of the time from my experimentation.

Mark Simpson Bowfort Technologies Inc.

## Thread Discussions

Date :7/26/2005 10:51:37 AM Poster : Alan Rhodes

Attached is a beginning attempt to summarize the thoughts going through my head as I read the posts. Feel free to add to it and make a group thought, not an Alan interpretation of group thought.

I have not covered the Sine Wave thought exercise yet since I do not have the advanced indicator set, and stupidly beating my brain against the wall, had not yet read the solution. Also it was so counter intuitive that initially I had zero ideas as to what was a solution that would not curve fit to a sine wave.

[Thread discussions 072505.doc](#)

## Re: Thread Discussions

Date :7/26/2005 12:40:28 PM Poster : Mark Simpson

Alan,

That's a good summary.

Here's the answer to this one:

>b. Using the concept of setting stop losses at 50% of your gains on a 50% > profitable systems, what does that mean in real life? In other words, when > Marc says "yes, profit targets. Pick your entry price and say add "1-2%" to it.", > how did he develop the figure 1-2 %? And does that mean you set your stop > losses to (0.5-1%? 1-2% is just an arbitrary value to mean picking "Small profits". It's not set in stone, I just picked that to cover commissions and make a small bit of profit and be an amount we'd see for most securities (and I err'd on the conservative side). Some securities won't be able to manage 2% consistently, and some securities could be able to manage say 10% consistently. The target depends on how much volatility there is in what you're trading. Essentially you need to tune it to an amount that is consistently successful, i.e. avoid being greedy.

Also, it depends on how predictive your entry signal is. If it's good, you can likely up your targets.

To be successful at this strategy you obviously need low commissions. Cheap commissions with a good hands on trading interface can be found at <http://www.interactivebrokers.com> in case you're not getting the best deal with your broker. Also, for all you international folks, IB allows you to exchange money at close to interbank rates, for when you're changing into your local currency.

Regarding the stop loss. To me a stop loss is a function of risk. I always would want a stop loss in case (due to equipment problems or tradable/market/world events), however if I have a better model, the risk profile will be different than a poor model and stop losses would be different.

A consistently good approach would be to have your stop loss at half the value of your target. With that approach alone, you could consistently make money with a 50% successful system. However, the model may preclude this from happening.

E.G. If you have a model that consistently heads down before it heads up, you could get stopped out every time.

It's very much a personal decision, and one that NST allows you to simulate with trading strategies. Money management is a separate topic (and one I'm not going to

get into as there are many good books written on it), however be aware that with a good model, bad money management techniques can sink you.

Mark Simpson Bowfort Technologies Inc.

**Re: Thread Discussions**

Date :7/26/2005 2:57:53 PM Poster : Steve Eberbach

Mark: "E.G. if you had a model that consistently heads down.....you could get stopped out every time."

Conversely, you could achieve negative slippage by using limit orders to reverse your position instead of stop orders! That is what I meant earlier by most often "trying" to trade against your rules instead of just with them, and having multiple sets of conditions for reversing position. How can this be done? In NST I write a trading strategy using different conditions for both limit and stop orders and let the optimizer tell me which way is working best.

While I cannot propose a trading system which works consistently using this idea, I can say that I have learned a lot about price behavior which I would never know if I had not tried it.

Steve Eberbach

## Neural Net search for Functional Dependence

Date :7/28/2005 5:18:02 PM Poster : James Siebert

Greeting fellow data explorers,

I have been exploring Neural nets & data-mining for several years now, and Neuroshell Trader software for a little over a year.

I have been intrigued by the free exchange of ideas in this forum, and thought I might have something to contribute.

Neural Nets should be no more a mysterious "Black Box" than are the results from say a mathematical equation.

From a Math perspective, when you crank input values into a Function, you should get quite "predicable" output values back out, as the result.

Example: given the function

$$f(x) : x^2 - 2x + 1$$

if you feed it 5 as input you would expect 16 as a result ... very predictable. no problem.

A problem may arise, however when I tell you I just got a result of 25 can you tell me what the input was?

Yes, you can always solve the equation

$$25 = x^2 - 2x + 1 \text{ for } x$$

$$25 = (x-1) * (x-1)$$

$$25 = (x-1)^2$$

$$5 = (x-1)$$

$$5 + 1 = x \text{ (some equations are not so easy to solve)}$$

However, what do you do when you only think (theorize) there is a predictive function there, but you have no idea what the equation should be?

There's nothing to solve, only a hunch to prove, or disprove.

This is where Neural Nets (NN) can help. Since NN use math to try to "approximate" the functional relationship between inputs and output (assuming such a relationship actually exists). This is especially helpful when "Noise terms" make the hope of finding a nice, neat equation nearly impossible.

NN try to construct a generalized Formula or Polynomial that closely estimates of the relationship between inputs and outputs.

NN tell us if there is any merit to our theories. (aka. any correlation)

A trained NN should be able to take a set of unknown Input Values and make an "very educated guess" about what the Output value should be.

I picture NN as a "function machine" like this

$$f(x,a,b,c) ==> y$$

the mission of this NN machine (really a multi-term polynomial, with various weighted coefficients)

is to keep adjusting an input's importance, until each input is "assigned" its appropriate "functional role" [its weight] within the "context" of all the other functional inputs used.

It does this by Minimizing Prediction Errors and Maximizing Predictive Successes (thru iterative feedback adjustments based on x:y Correlation r-Scores)

Neural Nets cannot predict anything (accurately) IF the "theorized functional dependence" between inputs and outputs is faulty, and does not really exist.

Here's are a couple xls, the illustrate the concept of Correlation predictions in action.

[Functional Dependence and Predictions.xls](#)

[Functional Dependence and Predictions 3D.xls](#)

Also shows what happens to r-scores when Noise is introduced. and a possible technique for Noise correction (using previous Lagged Output result, as an input)

Thank all for the many interesting posts, Hope you find the xls examples helpful.

James S.

(newbie)

**Re: Neural Net search for Functional Dependence**

Date :7/29/2005 9:13:26 AM Poster : Marcel

Thank you James, you are welcome to contribute anytime! You may however have to send the XLS files to forum@ward.net, otherwise we won't be able to appreciate them...

Rgds, Marcel

**Re: Neural Net search for Functional Dependence**

Date :7/29/2005 1:09:40 PM Poster : Ward.net Webmaster He sent them. We were just a little slow attaching them. They are there now.

**Re: Neural Net search for Functional Dependence**

Date :7/29/2005 9:24:43 AM Poster : Alan Rhodes

Since James is my friend whose ideas I said I would not disclose, I would encourage you to get him to disclose as much as possible.



## **Using NN to test a Hunch about Z-Score**

Date :7/30/2005 2:50:31 PM Poster : James Siebert

Hi again

I've always had an interest in Z-Scores, since I learned about them in Statistics course at college.

Z-Scores have many benefits as a Indicator.

Here are a few:

1) They normalize the data series 2) They introduce no lag to the data 3) They allow "apples to apples" comparisons 4) They "score" today's value within the "context" of all the values in the Z Lookback Window (each Z-Score has built-in context) 5) They act like a relatively smooth Oscillator

Well what about my Z-Score "hunch"?

Since Z-Scores measure values in units of "Standard Deviation" (SD) and SD's represent a "partitoning" of the sample group into similar sub-groups,

I've always imagined this as:

Z-Scores between 0 and 1 were "run of the mill"

and Z-Scores moving from 1 and 2 indicate "something significant is happening"

and Z-Scores greater than 3 indicate "something very unusual is happening" (within the context of the Z window)

In other words, "Z-Scores don't stay above 3 for long." Conversely, there is a tendency for Z values to return to the Mean Value ( $Z = 0$  SD)

The Z-Score calculation is designed to "normalize" the sample data, in such a way that 0 is always the "average" value for the sample group.

SO ... my theory is this:

Since the day to day movement of the Z-Score resembles an Oscillator centered on 0, When that Oscillator is moving up, and crosses above some Threshold near 1 SD, I should pay attention, and probably Buy.

And when that Oscillator starts to correct, moving back to the center I should probably Sell. This Move back should be indicated by the Z-Score crossing below some Threshold near 2 SD.

SO, I asked myself, How can I use NeuroShell to prove or disprove this Z-Score Theory?

If the Theory holds up, How can I use NeuroShell to improve upon the predictive results of the Theory?

Attached is a series of simple NeuroShell test charts to explore this Z-Score Theory.

Results here lead me to believe that this Z-Score Entry-Exit plan has potential:

[ZScore Theory Experiment.zip](#)

Zip File includes 5 progressive NeuroShell charts that illustrate my "test plan" to validate the Theory:

001) Theory\_Z1SD-Z2SD 001\_A INTC Validated NN 23.cht 002) Theory\_Z1SD-Z2SD

002\_A INTC Implement TS2 12.cht 003) Theory\_Z1SD-Z2SD 003\_A INTC Retrain NN 25.cht 004) Theory\_Z1SD-Z2SD 004\_A INTC Implement2 TS1 34.cht 005) Theory\_Z1SD-Z2SD 005\_C INTC Optimized TS3 18.cht

The Goal/Result of each Chart:

001) Build the Indicators that represent the Theory;

Use a Neural Net Prediction, to see if a profitable "Solution Space" exists for the Inputs Variable

$f(x,a,b) \implies y$

$f(\text{ZScore Value, Entry Threshold Value, Exit Threshold Value}) \implies \text{Profitable Trade}$

The UNOPTIMIZED NN, using default inputs, got 23% profit

## Check. Theory has a solution space. (It has merit)

002) Build a Trading System using the "validated" Indicators; This is the "conduct the Experiment" [Implementation] phase. My 1st Trading System, using the using default Indicators from 001

performed poorly (-1%)

A visual inspection of TS1 Entry and Exits points told me the problem was on the Exit-side.

It seems that "failures" were occurring on those cases where Z-Score Values never reach as high a 2 SD (the crossbelow(2) Exit trigger never fires in those cases)

SO, in the 2nd TS, I added another Exit condition to deal with this. (this extra crossbelow(1), in effect acts like a STOP)

## Check. TS2 captures the theoretical SD Profit Range (12% profit, good but not good enough, onward)

003) Time to Revisit the NN Validation process, taking into account the extra Trigger, called for by Implementation test (002)

This time I let the NN OPTIMIZE to find the the "best" Input Parameters (per NN approximation).

Re-testing the Modified NN, is still profitable, and improves upon the original NN (23%), with a 25% profit.

I plug in the New Thresholds found by NN-tuning into ALL the Original Indicators.

1.0 becomes 0.51 GoLong

2.0 becomes 1.38 ExitLong

## Check. Including a 2nd Exit trigger, as a STOP, improves the profitability "Solution Space" for the NN.

004) I conduct the TS "Implementation Experiment" again. This time using the NN-tuned Profitable Thresholds, in also TS conditional triggers.

1.0 becomes 0.51 GoLong

2.0 becomes 1.38 ExitLong

Trading System 1 now gets 34% profit (1 Exit Trigger) Trading System 2 now gets 16%

profit (2 Exit Triggers) using the NN recommended Entry/Exit Thresholds.

TS2, the one with the "stop" improves from 12 to 16% But TS1 has improved MUCH more (from -1 to 34%)

It's seems the Adjusted SD thresholds, are now LOW enough, that the upper "cross-below" Exit (2-SD) are NO longer resulting in missed Exits.

The 2nd "stop-gap" exit (002) is no longer needed, and does not help capture as much the profit (TS2), once the appropriate SD Thresholds are used by both TS.

SO ### My original Z-Score SD Theory appears to hold water; it's just that my human-estimate of the Range 1 to 2 SD needed some tweaking, provided by NN search algorithms. ###

## Check. Theory looks promising (34% promising)

005) Took the profitable TS1 from (004) and attempted to optimize it further in TS3, by Parameter Input Optimization, and various Training objectives.

The best result I could get with extra TS tuning was 18%

## No Check. TS1 in chart 004 seems to capture the Profitable up-legs (INTC) with the most accuracy (34%)

=====

Addendum: additional testing & extensions on Theory

This Z-Score Theory still should be further tested.

- 1) By starting with TS1 Chart 004, I would try it with several different Stocks to see if the NN-tuned SD Threshold values are "generic" or "specifically-tuned" to Intel Price series.
- 2) By starting with TS1 Chart 004, I would try to "mirror" the Entry and Exit conditions for the Short Trades, as well, and not just Long.

Negative Z-Scores should behave similarly to Positive Z-Scores, except that Negative Z-Scores, tell you the Price is moving BELOW the Norm (with Norm defined as 0 within the context of the Z-window)

=====

as a general rule I using NN for testing, validating, and tuning Ideas. (rough cut prototypes)

and TS for making those Ideas interact with the Data Series in an Objective, True or False matter. In Trading Systems, I'm looking to construct Logical rules, Conditions, and Triggers, that are well-defined, with little ambiguity. (finished consistent application)

I want to be able to Know Why a trade fails (ie. be able to "measure" the failure points) Neural Nets make such objective measurements quite difficult.

"Out of Sample Signals" may accurately "approximate" the N-Dimensional Solution surface (when it exists) but at those points where OS Signal predicts incorrectly you usually have no clue as to Why. And so little idea what to fix in the NN, without a lot of "trial and error".

Comments, questions ? (if you read this far, thanks)

Take care

James S.

(Newbie)

**Z-Scores Hunch some Follow-up Tests**

Date :7/30/2005 4:10:17 PM Poster : James Siebert

Short Postscript:

I acted on my recommendation (at the end of last email)

> This Z-Score Theory still should be further tested.

> 1) By starting with TS1 Chart 004, I would > try it with several different Stocks to > see if the NN-tuned SD Threshold values > are "generic" or "specifically-tuned" to Intel Price series.

WELL I did just that ...

This Trading System and its NN-tuned Threshold parameters seem to be "generic" (at least generic for "tech stocks" anyways)

Here are the results from my quick follow-up tests

[ZScore Theory followup tests.zip](#)

004\_a AMD 32% 004\_a MSFT 14% 004\_a NVDA 84% 004\_a ORCL 14% 004\_a SUNW 24% 004\_a SYMC 30%

Perhaps I was too quick to post my Z-Score Theory. (LOL)

I threw it together yesterday as an Example exercise.

Did not realize it might be consistently profitable, se la vie.

Feel Free to use the Theory, to improve upon it and to use for trading. (my contribution to the Forum, and the "free exchange" of Ideas.)

Let me know what improvements you come up with.

If you strike it big with the Z-Score Cross System, drop me a Post Card.

later

James S.

===== Notes: my file naming conventions

### number like 004 indicate version number in series

Alpha\_Tags: \_A, \_B, \_C, or \_D indicate Level of Optimization (none to full)

## Number at the end indicates the Annual Percent gain of the System

TS# right before end indicates which Trading System had the Profit

NN# right before end indicates which Neural Net had the Profit =====

**Re: Z-Scores Hunch some Follow-up Tests**

Date :7/31/2005 6:46:26 PM

Hi James,

You're spot on with Z-Score. Try this out though and see if it performs better, just go short on a Zscore > X and long on a ZScore <X where X is some value <> +- 2. You'll find it works pretty much on any security.

I see ZScore as a certain class of at least zero lag (and arguably leading) indicator. This is a probability class of indicator. Kind of like this:

If you were to say, what is the probability of an event happening? Now take a contrarian view, and say if Z-Score reached this high a value, what is the likelihood of it turning around and heading the other way. As more extreme values happen less frequently it's reasonable to assume that they will revert the more extreme they are.

So it becomes a trade off. I.E. The more sure you want to be that it will revert, the higher the absolute value you look for. But that comes at the expense of trades. I.E. 3 SD events happen less frequently than 2 SD events.

Also, you'll note things like 3SD events will often show up at the same time in many stocks at once due to a "market". So just saying, I'll scan the market for 3SD events might not be too useful either if you want to trade frequently.

With the probability type indicators you can achieve 60-80% successful trades depending on how extreme the level is that you're looking for. You can get even higher success rates, but then you don't get enough signals to be practical. This is a zero-lag technique that can be used to remove the 4 bars of lag at entry.

Another probability type indicator is the "Probability of a Turning Point" type of indicators in the Turning Points add on. And pretty much anything that indicates an extreme value of something with zero lag, that you can take a contrarian approach with.

However, say RSI being an extreme value won't work, because it's not zero lag in the first place.

Also, bear in mind that looking for a peak/valley in Z-Score would add lag for peak/valley detection.

Another gotch ya is trend. Sometimes a longer term trend with shorter term Z-Score can end up with the ZScore not producing the required action, and the Z-Score starts reverting to the mean prematurely, as of course the mean is now following the trend. However, this doesn't happen often enough to cause any major problem if you don't use excessively short Z-Scores.

Mark Simpson Bowfort Technologies Inc.

### **Re: Z-Scores Hunch some Follow-up Tests**

Date :8/1/2005 3:57:04 PM

Mark

Thanks for the pointers on Z-Score Very Helpful. Especially the "gotchas" at the end.

I never thought about Z-Score being "eclipsed" by a longer-window of the Trend.

In the case of a long-term Trend, if the price is continually going up what is the Norm, in that Context? It must be going up too, but it's still going to be plotted as 0. Z-Scores can be misleading in this situation.

Thanks's for that tip, I never realized this.

====

I've tried to build your ZScore system. Letting TS optimize for the best Thresholds between -2 and +2.

Results were very interesting.

I found there were several way to set up Entry and Exits, whether or not they had "common" or "independent" Threshold Search spaces.

Here were the best Results I could get, so far:

#### TRADING STRATEGY #4

Theory\_Z-2SD-Z+2SD 014\_C INTC Implement3 TS4 19.cht

Intel Corp:OTC (INTC) 19% Annual Profit (last 24 months)

TRADING RULES { Optimized for ((W-L)\*Profit) }

BUY LONG CONDITIONS: CrossAbove(ZScore(Price-4,15),Mul2(1,1.41)) < Go Long >

SELL LONG CONDITIONS: [1 of which must be true]

CrossBelow(ZScore(Price-4,15),Mul2(1,1.66)) < Same as Go Short >

CrossBelow(ZScore(Price-4,15),Mul2(1,-2)) < Stop Loss >

SELL SHORT CONDITIONS: CrossBelow(ZScore(Price-4,15),Mul2(1,1.66)) < Go Short >

COVER SHORT CONDITIONS: [1 of which must be true]

CrossAbove(ZScore(Price-4,15),Mul2(1,1.41)) <

Same as Go Long > CrossAbove(ZScore(Price-4,15),Mul2(1,0.75)) < Stop Loss >

I'll have to keep exploring this.

[ZScores2-2 SineReversals.zip](#)

( Zip File contains SD -2 to +2 Zscore ranges. plus the Tangent Reveral analysis xls, described below)

=====

Mark, you mentioned another useful probability indicator

"Probability of a Turning Point" which sounds intriguing.

(any hints on how to do this would be appreciated)

I've noticed that with a "smoothed" momentum indicator you can usually find the Tops (Bottoms) (ie Turning Points)

by taking the 1-Day Velocity and looking for it to go from Positive to Negative for Tops and from Negative to Positive for Bottoms

Top: CrossBelow(Velocity(MomOsc,1),0) Bottom:

CrossBelow(Velocity(MomOsc,1),0)

The smoother the Momentum Oscillator the better the reversals (smoothing without introducing lag seem to be the "ultimate" trick needed here)

[BTW Ehler's Book: "MESA and Trading Market Cycles", pg 50-51 describes a cool way to do just that, get a 0-Lag Smoothed Momentum Indicator. But it requires Variable Window Indicators for SMA & Momentum, with the Window parameters equal to the QuarterCycle; I've built the DLLs for this with PowerBasic, with very promising results, so far.]

Anyways, back to Velocity Reversal points, I started to examine this using SineWaves in Excel.

When I take the Ratio of  
(CycleMax - CyclePoint) / Velocity(CyclePoint,1)

I notice something VERY interesting:

Just before each Sinewave Bottom (conversely Top) there is an "early warning" of the Pending Reversal:

One day before the Sine actually reverses This "Converging Tangent" Ratio grows to at least 3 times it's previous value, sometimes there is a 10-fold increase, immediately afterwhich the Ratio Reverses signs. (ie. It has crossed the Zero-Slope Tangent, and starts to head back "uphill")

Note: in the days leading up to this Bottom Reversal, the 1-Unit Deltas of this Ratio, just grow GRADUALLY, less than (1.0 \* Previous Ratio). And then suddenly explode: (3.0+ \* Previous Ratio)

I've many a few attempts to re-build this as an Indicator, against market data, with little success so far. either the My Cycle Max windows are off, or the inherit Lag in the Hilbert Dominant Cycle is interfering with the Indicator precision.

SO My current Quest IS to build a Zero-Lag or Low-Lag CYCLE Indicator, by measuring Phase Angles, and extrapolating the angle to CycleLength. I'm making good progress with this.

anyhow thanks for your feedback talk to you later.

James

### **Re: Z-Scores Hunch some Follow-up Tests**

Date :8/4/2005 6:13:59 AM Poster : Marcel  
All,

> I've tried to build your ZScore system. > Letting TS optimize for the best Thresholds > between -2 and +2. > > Results were very interesting.

By following up on the above example and applying what we discussed in earlier threads, a logical consequence would be to try to predict the ZScores indicator with a TDNN.

[Theory Z-2SD-Z+2SD 099 C INTC Test \(data saved\).zip](#)

At first sight the Out of Sample signal seems to look promising with a Correlation(r) of around 0.5, but a closer look will evidence the introduction of a nasty lag. To be precise a lag of 4 days, which corresponds to the number of days we attempt to predict in the future. Another observation is that the lagged inputs do not contribute to a better result. Any moving average would do a better job! What is wrong here?

Thanks, Marcel

### **Re: Z-Scores Hunch some Follow-up Tests**

Date :8/9/2005 5:54:58 AM Poster : Mark Simpson  
>On 8/4/2005 6:13:59 AM Marcel wrote: >All,

>> I've tried to build your ZScore system. >> Letting TS optimize for the best Thresholds >> between -2 and +2. >> >> Results were very interesting.

>By following up on the above example and applying what we discussed in earlier >threads, a logical consequence would be to try to predict the ZScores indicator with a >TDNN.

>At first sight the Out of Sample signal seems to look promising with a Correlation(r) of >around 0.5, but a closer look will evidence the introduction of a nasty lag. To be >precise a lag of 4 days, which corresponds to the number of days we attempt to >predict in the future. Another observation is that the lagged inputs do not contribute to >a better result. Any moving average would do a better job! What is wrong here?

>Thanks, Marcel It's important to remember that when using the Z-Score, we're looking for a contrarian position on a threshold being reached. I.E. When we reached +2SD we might want to go short. When we reach -2SD we want to go long. (bear in mind 2SD is a little on the low side).

I.E. You're building a NN to predict Z-Score in the chart you provided. However most of the time Z-Score isn't too meaningful, it's only at the extremes that we're interested. An NN learns the data you provide it and not a subset of it, unless you specify the subset only (i.e. exclude the rest) by some other means.

Mark Simpson Bowfort Technologies Inc.

### **Re: Z-Scores Hunch some Follow-up Tests**

Date :8/10/2005 2:43:26 PM Poster : Marcel

> On 8/9/2005 5:54:58 AM Mark Simpson wrote: > It's important to remember that when using the Z-Score, we're looking for > a contrarian position on a threshold being reached. I.E. When we reached > +2SD we might want to go short. When we reach -2SD we want to go long. > (bear in mind 2SD is a little on the low side). > > I.E. You're building a NN to predict Z-Score in the chart you provided. > However most of the time Z-Score isn't too meaningful, it's only at the > extremes that we're interested. An NN learns the data you provide it and > not a subset of it, unless you specify the subset only (i.e. exclude the rest) > by some other means.

I understand what strategy makes Z-Score interesting, i.e. to look for extreme values (+/- 2SD) that make a turning point highly probable. I have also to admit that it's not to meaningful to build a NN to predict Z-Scores - well, it was just another experiment... Btw, the NN did really a great job (this with reference to building a NN to learn a RSI)!

But the reason I wrote the above was because of that 4 bars lag that gets introduced when plotting on the same chart the Actual signal and the Out of Sample signal. It's a pure technical question that I can formulate also as follows: Why does the Actual signal get shifted to the left by the number of predicted bars in future? It seems to me that the engine does this for learning purposes - but "Actual" means exactly the one that is occurring, so why shift it? Maybe it's up to Ward Systems to reply...

Regards, Marcel

### **Re: Z-Scores Hunch some Follow-up Tests**



Date :8/10/2005 5:07:34 PM Poster : Ward.net Webmaster

The Actual signal is not shifted differently than the Out-of-sample signal. Both are plotted on the bar dated when the prediction is made, not the day the prediction is to come true. Both are for the same number of bars into the future. You may be seeing some other effect, like the one described in the tip on this site by this name:

What If Your Predictions are Just Time Lags of Your Actual Output? (OR Another Reason Not to Predict Close) (8/31/1998)

**Re: Z-Scores Hunch some Follow-up Tests**

Date :8/11/2005 4:13:24 AM Poster : Marcel

Thanks, this explains it!

Best Regards, Marcel

**Re: Z-Scores Hunch some Follow-up Tests**

Date :8/10/2005 9:29:49 PM Poster : James Siebert

Marcel I was confused by this initially too. I believe these NST Help Topics may explain what's going on: Cheers James

Tools Menu Options Choice Predictions Tab Help on this is:

===== Use the prediction options to select which data series get displayed when completing a prediction and which data series to display in the Existing Data/Calculations list. For more information regarding the prediction data series versus the prediction signal data series refer to Using Predictions. Choose the Insert new prediction settings: · Insert prediction signal data series – After you have finished creating a prediction, using this option will display the prediction data series on the chart with predicted data values on the same bar they were predicted (For example the 2-day prediction for July 5th would be shown

on July 3rd.). This results in predictions that can be used in other indicators or trading strategies prior to the actual result occurring.

· Insert prediction data series – After you have finished creating a prediction, using this option will display the prediction data series on the chart with predicted data values on the bar for which they are being predicted (For example the 2-day prediction for July 5th would be shown on July 5th.). This results in prediction values that can not be used in other indicators until the actual result is already know. This also results in the prediction values being displayed on the chart on future bars that have not yet occurred. Select Existing data/calculations settings: · List walk-forwards and current network data series - shows all of the walk-forwards and current network data series in your Existing data/calculations settings. · List prediction data series - displays both the prediction and the prediction signal data series. If not selected, then only the prediction signal data series will be displayed in the Existing Data/Calculations list. Copyright © 1997-2003 Ward Systems Group, Inc. All rights reserved. =====

Help on: Using Predictions NeuroShell Trader produces two versions of a prediction, a version meant to be displayed on charts that is labeled "Out of Sample" and a version meant to be used as input to predictions and trading strategies that is labeled "Out of Sample Signal". When adding a prediction to a chart or creating an indicator to be displayed on a chart, you may want to use the "Out of Sample" version of a prediction.

The reason to do this is so that all predictions and indicators with predictions as inputs, will be placed on the graph at the date

in which it is being predicted for. Doing so aligns the predictions to the actual prediction line for easy comparison and enables the prediction line and indicators based upon the prediction to extend out into the future.

When adding a prediction to a trading strategy/prediction or creating an indicator to be used in a trading strategy/prediction, NeuroShell Trader will only allow selection of the "Out of Sample Signal" version of a prediction. It does this so that when the prediction is used as an input, you are using a predicted future value on the day it is predicted instead of an old predicted value for the current day. Having these two versions of a prediction available may create a problem if you try to add an indicator from your chart that uses an "Out of Sample" prediction as one of its inputs to a trading strategy or prediction. You should not add this indicator as an input because the indicator displayed on your chart contains the "Out of Sample" version of a prediction. Instead you should rebuild this indicator so that it uses the "Out of Sample Signal" version of the prediction. By rebuilding the indicator, you will be using a predicted future value on the day it is

predicted instead of an old predicted value for the current day. Copyright © 1997-2003 Ward Systems Group, Inc. All rights reserved.

=====

### **Re: Z-Scores Hunch some Follow-up Tests**

Date :8/7/2005 6:40:17 AM Poster : Mark Simpson

On 8/1/2005 3:57:04 PM James Siebert wrote:

>Mark, you mentioned another useful probability indicator >"Probability of a Turning Point" which sounds intriguing. >(any hints on how to do this would be appreciated)

Buy the "Turning Points" add on from ward, and insert the following indicators:

PeakProbB ValleyProbB

>I've many a few attempts to re-build this as an Indicator, >against market data, with little success so far. >either the My Cycle Max windows are off, >or the inherit Lag in the Hilbert Dominant Cycle >is interfering with the Indicator precision. I always feel a little uneasy with the concept of a Dominant Cycle. I believe there are times when a primary cycle that is bigger than the others does exist, but they are small instances in time, and many of the other times we see a DC, it's a few cycles superimposed. And as you suggested because of the lag, it can be quite often gone before it's spotted.

So though I see spectrum analysis as a good solution to HUP (assuming you use the correct kind of spectrum analysis), I don't see assuming there's one frequency instead of a spectrum is the best thing to do. I.E. DC is kind of a half way house between non-adaptive and a spectrum analysis where we're assuming there's only one component in the spectrum (or another way of looking at it, is an adaptive indicator)

Although obviously the concept of 1 frequency is certainly better (and more adaptive), than just a regular indicator that is fixed in period.

The other issue is detecting all frequencies instantaneously without normalizing time means that you don't have any longevity. I.E. The underlying time base (the rate of trading in our case) is changing constantly and doesn't persist for long, generally by the time you've measured it, it's gone. We'll talk about this when normalizing time (later discussion). You'll see that by fixing the time issue first, all most all indicators (including things like DC, will perform better).

>SO My current Quest IS to build >a Zero-Lag or Low-Lag CYCLE Inidictor, >by measuring Phase Angles, >and extrapolating the angle to CycleLength. >I'm making good progress with this. You're in the right ball park certainly.

Mark Simpson Bowfort Technologies Inc.

### **Re: Z-Scores Hunch some Follow-up Tests**

Date :8/8/2005 12:59:59 AM Poster : James Siebert

Mark

I've agree with you and I also:

"feel a little uneasy with the concept of a Dominant Cycle. I believe there are times when a primary cycle that is bigger than the others does exist, but they are small instances in time, and many of the other times we see a DC, it's a few cycles superimposed."

as you summarized quite nicely.

It seems only "natural" that several different cycles are occurring simultaneously, even if only due to the different "time horizons" of the various traders and participants in a market (Day, Swing, Short, Intermediate, Long-term views, etc).

The KST (thanks to M. Pring) seems to address these "sub-currents" nicely. I've gotten very good NN results with KST, after letting the NN find the appropriate window lengths, for each time horizon. However, seemed too much like curve-fitting, and usually did not project forward well.

I've been focused on Hilbert DominantCycle lately largely because of Ehlers [Cybernetics p 108] when he insists/believes:

"Although all this is going on with cycle components, the enduring characteristics is that generally only one tradable cycle at a time is present for the data set being used. I [Ehlers] prefer the term Dominant Cycle to denote that one component."

I use his Hilbert DC code extensively, but it does have many drawbacks: 1) Lag (4-8 days, depending on the reference) 2) doesn't handle trends well 3) is based on the differential on H & L of current bar (why these) 4) uses 5-bar Median smoothing to dampen Phase Angle noise. 5) ignores Neg. Phase Angles (calls it going backward in time) 6) Hilbert Sampling algorithm is poorly explained. 7) Ehlers does not address sub-component frequencies.

But the alternative Fournier Transform which can find the SubComponents that make up a Cycle, has an assumption for "stationary dataset" (ie all the sub-component Cycle Lengths will remain fixed over time. This is hardly a given in market data.)

I've found Hilbert DC a good "generalization" and model, and it has helped me learn the Cycle Math involved. And I'm hoping to improve upon it, myself. In the meantime I've got to use some sort of cycle detection. (I've also been looking to Channel

Breakouts, as an alternative, and a "lag-less" way to tell a Trend may be starting, and conversely a Cycle is ending)

This weekend I determined the algebraic solutions to calcing the 1-day lead to any 2 component SineWave (its just an idealized solution, for now, using noiseless data of 2 sine waves, but its a start) The calced Lead follows the component curve perfectly, and requires as inputs only the "Cycle Lengths" and "Amplitudes" of each Sub-component.

and it appears the Lead can be adjusted forward all the way up to a half cycle lead. (a 10-day Lead, where the min CycLength is 20-Day)

Mark, thanks for taking the time to go over my posts and for the helpful Feedback  
James Siebert

### **Re: Z-Scores Hunch some Follow-up Tests**

Date :8/9/2005 11:41:36 AM Poster : Mark Simpson

On 8/8/2005 12:59:59 AM James Siebert wrote: >Mark

>The KST (thanks to M. Pring) seems to >address these "sub-currents" nicely. >I've gotten very good NN results with KST, >after letting the NN find the appropriate window lengths, >for each time horizon. >However, seemed too much like curve-fitting, >and usually did not project forward well. The formula has SMA's in which introduce lag.

This is an example of a normal multiple time frame system. Essentially you can use multiple time frames to resolve some of the uncertainty about direction. The only issue is that the longer time frames have more lag. Still MTF'ing a system is better than not. Also check out:

<http://www.dspguru.com/info/faqs/fir/basics.htm>

you can design FIR and IIR filters that you can easily implement in NST which have similar properties to things like KST and some of the ones sold as zero lag or near zero lag moving averages.

MTF'ing however comes back to a similar discussion about cycles. I.E. Is 3 timeframes really enough?

>I've been focused on Hilbert DominantCycle lately >largely because of Ehlers [Cybernetics p 108] >when he insists/believes:

>"Although all this is going on with cycle components, >the enduring characteristics is that generally >only one tradable cycle at a time is present >for the data set being used. I [Ehlers] prefer >the term Dominant Cycle to denote that one component."

I've always had an issue with this one. I'm not downgrading Ehlers work by any means, he does superb and sound analysis, and I recommend people read his books as he has a non-conventional approach. However I do have issue with the DC, because an FFT will show a spectrum at many frequencies. Even if you can see a clear cycle going on, you'll notice there's normally at least a longer term cycle superimposed on top. In reality a clear cycle would be traded out virtually immediately, so the next issue becomes detecting a cycle before it's gone.

>I use his Hilbert DC code extensively, but it does >have many drawbacks: >1) Lag (4-8 days, depending on the reference) >2) doesn't handle trends well  
A trend can be viewed as a longer term cycle. Hence multicycle activity which hilbert can't resolve.

>3) is based on the differential on H & L of current bar (why these) He doesn't say in his book, but he's likely using  $(H+L)/2$  for noise reduction.

You could use anything here, even  $(O+H+L+C)/4$  for slightly better noise reduction.

>5) ignores Neg. Phase Angles (calls it going backward in time)

My advice is not to ignore Negative Phase Angles. Time going backwards can be very indicative of events.

>But the alternative Fournier Transform >which can find the SubComponents that make up a Cycle, >has an assumption for "stationary dataset" >(ie all the sub-component Cycle Lengths >will remain fixed over time. >This is hardly a given in market data.)

You can also use a windowed FFT to sample non-stationarity. However you still need the start and end of the data to start at 0, and the end point is precisely the point we need the most precision, which normally meanse you have to throw FFT's out of the window.

I did have a statistician friend of mine once suggest that instead of applying a hanning window to the data before FFT'ing it, if you imaged price on the usual horizontal line, then you could rotate the 2D plane to make price start/end at 0. (obviously we'd be dealing with Z-Scored price or some other normalization). I abandoned that idea purely because it would add noise to the FFT which I didn't have enough knowledge about the math involved to remove, however it might be worth a try for you (let me know how you get on with it, if you do).

Mark Simpson Bowfort Technologies Inc.

### **Re: Z-Scores Hunch some Follow-up Tests**

Date :8/7/2005 9:35:18 AM Poster : Mark Simpson

On 8/1/2005 3:57:04 PM James Siebert wrote:

>When I take the Ratio of  $(\text{CycleMax} - \text{CyclePoint}) / \text{Velocity}(\text{CyclePoint}, 1)$  >I notice something VERY interesting: >Just before each Sinewave Bottom (conversely Top) >there is an "early warning" of the Pending Reversal:

>One day before the Sine actually reverses >This "Converging Tangent" Ratio grows to at least 3 times >it's previous value, sometimes there is a 10-fold increase, >immediately afterwhich the Ratio Reverses signs. >(ie. It has crossed the Zero-Slope Tangent, >and starts to head back "uphill")

That shape looks very similar to a sigmoid or hyperbolic tan function rotated 90 degrees. Also if you check out the tan function and mirror it, it looks similar.

<http://mathworld.wolfram.com/Tangent.html>

Price distributions aren't normal, and you want bigger sensitivity in the extremes. I.E. Your indicator provides greater sensitivy at the turning points of the sine wave, which is better than assuming normality.

How does it do on real data?

Mark Simpson Bowfort Technologies Inc.

**Re: Z-Scores Hunch some Follow-up Tests**

Date :8/8/2005 1:17:43 AM Poster : James Siebert

> How does it do on real data?

That's the Problem, Seems that real data is too noisy and jumps past or obscures the "early warning"

However I think I gave up on this too quickly. It occurred to me later, that the way I was finding the "previous max" was "flawed"

I should not be using a "fixed window" Price High Lookback but a "variable window" Max function. (once against how far to look back for the max is problematic)

What's the time horizon of the "immediate cycle"? My early warning calc is subtracting against this "high water" mark, which is no problem in a Sine Wave.

But in market data when is the recent high "too recent" or not "recent enough"

So I'm forced to go back to Hilbert DominantCycle again to tell me the "just right" Lookback window, (or likely:  $1.5 \times \text{HDC Window}$ )

But is this accurate enough to peg the recent top? Not sure, will have to check it out some more.

The early warning idea seemed interesting and has potential if anyone can figure out how to get a handle on it. That's why I posted it.

Thanks again for the feedback

(I was thinking if might be related to the arctan, or something like that, especially with the Infinity as one reversal, an the Zeros at the other.)

James

**Re: Z-Scores Hunch some Follow-up Tests**

Date :8/2/2005 7:18:34 AM Poster : Marcel

James,

I've gone through your example step by step. It was interesting to follow someone else's approach, and to see that more and more substantial knowledge is shared in this forum.

I took the opportunity to learn a bit more about Z-Scores, from my perspective yet another way of generating a valuable and useful signal. From my experience however, models based on traditional trading strategies (like crossovers, breakouts etc.) are limited in nature. Yes, you can optimize (curve fit) them to work particularly well for certain instruments or market situations, but when you try to generalize or adapt them to broader or longer market conditions, they miserably fail to deliver the expected performance - at best you can cover your expenses. I base this observation a) on a large number of tests I've done myself, and b) on the simple fact that if this perfect conventional model would exist, it would have been found by someone else years ago...

That's the reason why I'm taking a second chance with NN's. If we learn to correctly apply the predictive potential inherent to NN's, I think we are a) moving onto a ground that is pretty unexplored and untested by thousands of predecessors (mainly due to the unlimited number of concepts one can implement), and b) adding a powerful and

promising technology to the traditional trading strategies (hence an enrichment, complimentary).

The journey that Mark is taking us thru is paramount to achieve this goal, in my opinion we have a unique chance to learn and discuss principles and concepts that no book or lesson can teach.

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### **Re: Z-Scores Hunch some Follow-up Tests**

Date :8/2/2005 10:14:56 AM Poster : Mark Simpson

>I took the opportunity to learn a bit more about Z-Scores, from my perspective yet  
>another way of generating a valuable and useful signal. From my experience  
however, >models based on traditional trading strategies (like crossovers, breakouts  
etc.) are >limited in nature. Yes, you can optimize (curve fit) them to work particularly  
well for >certain instruments or market situations, but when you try to generalize or  
adapt them >to broader or longer market conditions, they miserably fail to deliver the  
expected >performance - at best you can cover your expenses. I base this  
observation a) on a >large number of tests I've done myself, and b) on the simple  
fact that if this perfect >conventional model would exist, it would have been found by  
someone else years ago...

This model that James is talking about is a conventional model being used with  
unconventional thinking. I.E. Crossovers can work if you have zero-lag indicators. And  
it will work on most things too. Quite often you can use conventional models in  
unconventional ways and get them to work if you consider the lag issue.

>That's the reason why I'm taking a second chance with NN's. If we learn to correctly  
>apply the predictive potential inherent to NN's, I think we are a) moving onto a  
ground >that is pretty unexplored and untested by thousands of predecessors (mainly  
due to >the unlimited number of concepts one can implement), and b) adding a  
powerful and >promising technology to the traditional trading strategies (hence an  
enrichment, >complimentary).

But don't overrate the NN, they are a very useful tool, but only a part of the package. I'd say 50% is thinking about how to design good models, 40% is building your good inputs, and 10% is about the NN. The NN just saves a lot of work in figuring out the meaning of the 40%.

Mark Simpson Bowfort Technologies Inc.

**Re: Z-Scores Hunch some Follow-up Tests**

Date :8/3/2005 12:03:41 PM Poster : Marcel

Mark,

> This model that James is talking about is a conventional model > being used with unconventional thinking. I.E. Crossovers can > work if you have zero-lag indicators. And it will work on most > things too. Quite often you can use conventional models in > unconventional ways and get them to work if you consider the > lag issue.

That's an interesting comment, I had given up completely conventional models with the reasons I mentioned above. So let's discuss "unconventional ways". Are these linked/limited to the paradigm of feeding zero-lag indicators? Are there other tricks we should be aware of?

> I'd say 50% is thinking about how to design good models, 40% is > building your good inputs, and 10% is about the NN. The NN > just saves a lot of work in figuring out the meaning of the 40%.

Do you build models that make no use of NNs? Models that are solely relying on Trading Strategies?

Thanks, Marcel

**Re: Z-Scores Hunch some Follow-up Tests**

Date :8/9/2005 5:22:53 AM Poster : Mark Simpson

On 8/3/2005 12:03:41 PM Marcel wrote: Mark,

>That's an interesting comment, I had given up completely conventional models >with the reasons I mentioned above. So let's discuss "unconventional ways". >Are these linked/limited to the paradigm of feeding zero-lag indicators? Are >there other tricks we should be aware of? There are many ways. You can use conventional models in unconventional ways, or you can just be unconventional from the start. But it all hinges out of truly understanding lag, and the model design, once you have that beat, actually doing it is relatively simple.

>Do you build models that make no use of NNs? Models that are solely relying on >Trading Strategies?

Yes I do. I only use an NN if the relationship isn't obvious and if it's necessary. An NN is like any other tool, there's times when you need it and times when you don't. If you can't figure out a function, then the NN does it for you. Incidentally it's always worth running through an NN on paper (or NST's neural network training example I referenced earlier), just to learn how simple NN's are in concept and how a simple concept can generate something so powerful.

Mark Simpson Bowfort Technologies Inc.



### **Re: Z-Scores Hunch some Follow-up Tests**

Date :8/11/2005 9:05:03 AM Poster : Marcel

Mark – thanks v.m. for the feedback, really appreciate.

Now a personal comment to the Forum:

I'm honestly getting a bit lost with Z-Scores, Horst etc. The main reason is that my knowledge about statistics is pretty rusty, since I never had the chance or necessity to make use of it since I left university – many years ago. I don't know what other fellows feel, but for me in order to keep up with this thread, I need to go back pretty far to the basics, a lot of effort that prevents me from contributing or adding any value to the discussion.

I don't want this thread to stop, please continue as much as needed. As a silent reader, I will do whatever I can while refreshing my notions of statistics. On the other hand, there are a number of other discussions that have been left suspended, and that I would appreciate to see resumed.

On top of my head some examples:

- . Classes of indicators that work, and why they work
  - . How to identify the rest that don't and maybe a bit about how to fix them
  - . Teach a NN to learn RSI or any other indicator
  - . The curve fitting discussion
  - . Normalizing time; by fixing the time issue first, most indicators will perform better
- Filtering (DSP) techniques in our models

Thanks a lot! Marcel

### **Re: Z-Scores Hunch some Follow-up Tests**

Date :8/11/2005 6:39:47 PM Poster : Mark Simpson

>I don't want this thread to stop, please continue as much as needed. As a >silent reader, I will do whatever I can while refreshing my notions of statistics. > On the other hand, there are a number of other discussions that have been >left suspended, and that I would appreciate to see resumed.

Yes we have side tracked a bit. But lets just summarize this a bit and bring it back in scope to avoid some confusion. This is because Z-Score in particular is a pretty useful thing to use, so we don't want to throw it out.

I'm deliberately simplifying it for description purposes.

Essentially Z-Score is nothing miraculous, it just measures probability, another way of thinking of it is like this:

Zscore is a measure of how rare the value of bar is compared to the bars in window (periods). I.E. If price was meandering around a 2% range, and then suddenly jumped up or down by 10% in either direction, then a jump down might be flagged as a low zscore of say -3 and a jump up might be flagged as +3. The 2% range might be a zscore in the range -1 to +1 as the stock moved around in the -1% to +1% range (i.e. a 2% range). I.E. You can think of more extreme values of zscore as measuring improbable or unusual events.

It also doubles up as normalization, i.e. bringing things into a reasonable range

and centered around zero.

Another approach to z-score is that the more extreme the value is, the more likely the data point is meaningful, and that at some point it's likely to return to normal.

I.E. If we go down one day by 10% in price, and Z-Score signals -3, then the following days it is quite likely to want to head back (things don't go straight up or straight down more often than not).

So if you got a value of say -1 to +1, then you would say that it was a pretty normal occurrence. -2 or +2 would be less frequent, -3 or +3 would be even less frequent and so on.

The periods in the Z-Score should be set to something that is a reasonable sample length, i.e. a good number of bars, generally in the 100-300 range, you want to capture some history so you can see what's abnormal, but not too much, that abnormal becomes normal.

Now onto Hurst. ZScore assumes normality, all that is, is when you plot say returns of price on a histogram (technically log returns, but let's keep it simple), that the histogram follows a certain shape, often known as the normal distribution or the bell curve. Most random processes follow this same bell curve and it's just a statistical way of saying, well, something is normal. If the stocks were random, then they would follow this same bell curve.

However, the curves follow something called a Hurst Distribution more closely. All a Hurst distribution is, is a bell curve with fatter tails. I.E. The more extreme values in return in price would be more frequent than a random process would suggest. Hurst spotted this when analyzing flood data in the Nile, i.e. it wasn't a normal distribution, and he formalized this kind of data.

So, the question becomes, is a ZScore right to use? The answer is yes. However a Hurst distribution would give a slightly better model, which is why the discussion started about building a Hurst Score. It's not needed for this by any means, but it's some interesting research.

>On top of my head some examples: >- Classes of indicators that work, and why they work >- How to identify the rest that don't and maybe a bit about how to fix them >- Teach a NN to learn RSI or any other indicator These ones we've already discussed to some degree. So let's finish off these. Over to you guys.

>- The curve fitting discussion >- Normalizing time; by fixing the time issue first, most indicators will perform better >- Filtering (DSP) techniques in our models Let's finish off the top 3 first before going on to these. There are a lot of messages so far, and with many discussions going on it's getting a little confusing.

Mark Simpson Bowfort Technologies Inc.

### **Re: Z-Scores Hunch some Follow-up Tests**

Date :8/2/2005 11:13:45 AM Poster : James Siebert

Marcel

Thanks for the feedback, and taking the time to look at my Charts.

I tend to agree with you regarding "generalized" solutions.

If there was a "Golden Goose" Trading System, someone (or overuse) would have squashed it by now.

I like the metaphor of "Supply and Demand better. If and when "inefficiencies" exist in a Market, an alert observer can take advantage of an inefficiency, until it becomes "common knowledge" and the overall Market adjusts accordingly.

When this happens, the "edge" evaporates. There was a day when SMA(20) - SMA(50) Oscillator was a "killer system". Not any more. The fact that SMA(200) acts as the final support level, is because everyone expects to be such.

Usually, if the Price punches thru 200 day average, look out, as you can expect the "bottom to fall out."

This "inefficiencies" theory, I believe, is the main reason it is so hard to find a good Trading System using the QQQQ or MSFT. These stocks are so "high profile" that any "market inefficiencies" there were found long ago, by someone, (several someones) and are already accounted for, in the current behavior I think however such "inefficiencies" likely exist in other "unpopular" markets, which do not get the same level of scrutiny as the MSFTs of the world. The problem with such "below the radar" stocks is that they may not be liquid enough to support reliable patterns and signals. (another area to research, how to identify these) Marcel, one more observation I would make, and this has been the focus of much of my latest research, is that "traditional trading strategies (like crossovers, breakouts etc.)" you refer to can be leveraged back to life by applying them SELECTIVELY.

When combined with a Good "Market\_Mode" Indicator a traditional system can work surprisingly well.

A "Market\_Mode" Indicator attempts to tell you if the Price Series is behaving in Cycle\_Mode or Trending\_Mode. (aka. Range-Bound vs Breaking Out)

The Selection Rule is:

Use a "Momentum Reversal" System while in Cycle\_Mode.

Use an "Average Oscillating" System while in Trend\_Mode.

The catch here, is finding a Good "Market\_Mode" Indicator. VHF is one, Ehler's MESA is another, Elher's Hilbert Dominant Cycle also helps, Murray Ruggiero has yet another custom indicator to detect Cycles.

But they all have problems. Yet as imperfect as they are, I believe they still give you that "edge" that the average market participant does not have.

I'm working on my own Cycle Detection system now that hopefully will have minimal Lag, when perfected, (fingers crossed) and provide an edge over other "Market\_Mode" Indicators, if even for only a short while, until similar Indicators are constructed by other participants.

Marcel as you note, NN is new ground, and represents unexplored territory, whose promise is that it may hold untapped resources (ie. "inefficiencies"). They won't say under-utilized for long, with great tools like NS which make NN math accessible, to average traders.

The ray of hope here though, is that with N-Dimensional ways of combining input signals, and the likely limitless possibilities for finding NN Solution Spaces, the chance of NN having a "self correcting" market and due to "common knowledge" factor, is less

likely.

That's my take anyways

Cheers,

James S.

### **Re: Z-Scores Hunch some Follow-up Tests**

Date :8/3/2005 8:46:23 AM Poster : Mark Simpson

>The Fact that SMA(200) acts as the final support level, >is because everyone expects to be such. >Usually, if the Price punches thru 200 day average, >look out, as you can expect the "bottom to fall out."

That reminded me of another zero-lag (questionable leading) indicator. Support and Resistance lines.

>This "inefficiencies" theory, I believe, >is main reason it is so hard to find >a good Trading System using the QQQQ or MSFT.

>These stocks are so "high profile" that >any "market inefficiencies" there were found long ago, >by someone, (several someones) >and are already be accounted for, in the current behavior

Try plotting a distribution of log percent returns of the market. You'll initially think it's normal, but if you look closely, you'll see the tails are considerably fatter. The opportunity is still there, and it's in the tails, you just have to find it, and it's not what the majority are doing. This is partly the reason I don't provide a complete trading system that works, more ideas that can be put together. Essentially if you provide a trading system, and it's used by enough people then the opportunity will be traded out, however many people with different systems still leave the potential there.

However as skills improve overall and analysis progresses, I'm sure years into the future the techniques we're learning now will no longer work, so it's important to keep on top of things.

>The catch here, is finding a Good "Market\_Mode" Indicator. >VHF is one, Ehler's MESA is another, >Elher's Hilbert Dominant Cycle also helps, >Murray Ruggerio has yet another custom indicator >to detect Cycles.

Also check out entropy type indicators and fractal dimension.

Mark Simpson Bowfort Technologies Inc.

### **Re: Z-Scores Hunch some Follow-up Tests**

Date :8/3/2005 11:05:24 AM Poster : James Siebert

Thanks again, I've read a little bit about "fat tails" distribution (Hurst distribution, 1st seen in patterns of Nile River Floods) but never realize that the tails "were the profits were".

("Fat Tails" are roughly equivalent to seeing many more Event occurrences > +3 SD, than one should expect when data has "Normal" Distribution [a Bell-Shaped curve, due the "laws of averages", and will Normally have "skinny tails", few events >[3]. ])

"Fat tails" in the data imply that at the Extremes, other behaviour is kicking in besides the "laws of chance".

If true, How does this effect your Contarian Z-score return to the Norm system? It would seem there might be a profitable "trading zone" between 2 and 3 (4?) SD if "Fat tails" are normal situation?

I like you're focus on tools over systems, that tends to be my focus as well. You can tell a "good carpenter" by his adeptness with a wide variety of tools. And by the number of tools in his toolbox.

My boss has a saying, + meant to promote creative problem-solving:

"If your only tool is a hammer, then every problem looks like a nail"

IE. what other Tool might work?

>>The catch here, is finding a Good "Market\_Mode" Indicator. >>VHF is one, Ehler's MESA is another, >>Elher's Hilbert Dominant Cycle also helps, >>Murray Ruggiero has yet another custom indicator >>to detect Cycles.

>Also check out entropy type indicators and fractal dimension.

I have an interest in both of these topics, but as of yet have been unable to find practical ways to apply them to Market Time Series Data.

Although, I was starting to see some Fractal patterns in my 4-Cluster Analysis system, alluded to in my Correlation Xls (at bottom)

I was observing the sequence of event hits striking within each Cluster circle, seemed to "bunch together" in into "tiered signal blocks" as Events alternated between Clusters (ie was not random, could see Trend Changes forming, like Clouds on the horizon)

Mark, thanks again for your insights and direction.

Sorry, my last message yesterday had so many typos, I did not have time to proofread it. (I got a day job)

Be kind when you evaluate my "quiz answers". The "physics of zero-lag" is still quite new to me, and I'm learning more about this daily. I took a shot, given what I "think I know" now.

Thank for putting together such challenging questions.

Best regards,

James S.

### **Re: Z-Scores Hunch some Follow-up Tests**

Date :8/7/2005 1:48:12 PM Poster : Mark Simpson

>If true, How does this effect your >Contarian Z-score return to the Norm system?

>It would seem there might be a profitable "trading zone" >between 2 and 3 (4?) SD if "Fat tails" are normal situation?

Yes, that's correct, it is similar to Hurst, and Fat Tails are the norm. You only have to look at market crashes, and other major movements in price to see that some of would be extremely infrequent (thousands or millions of years) based on a normal distribution. However in real life they happen a lot more frequently. So that said, you

look for the fat tails, and trade those.

Z-Score models it okay if we bear in mind extreme values happen more frequently than normality. Maybe we could figure out a Hurst Score instead of a Z-Score?

>Although, I was starting to see some Fractal patterns >in my 4-Cluster Analysis system, >alluded to in my Correlation XIs (at bottom)

>I was observing the sequence of event hits >striking within each Cluster circle, >seemed to "bunch together" in >into "tiered signal blocks" as Events >alteranated between Clusters >(ie was not random, >could see Trend Changes forming, like Clouds on the horizon)

When we normalize time, this will start dropping into place.

Mark Simpson Bowfort Technologies Inc.

### **Re: Z-Scores Hunch some Follow-up Tests**

Date :8/8/2005 2:33:47 AM Poster : James Siebert

>Z-Score models it okay if we bear in mind extreme values happen more frequently >than normality. Maybe we could figure out a Hurst Score instead of a Z-Score?

I like that idea, "a Hurst Score instead of a Z-Score" I'll have to put that one on my to-do research list.

no time like the present...

to kick off this Hurst subject here is the "best" reference I have which tries to define Hurst exponent/distributions

(Note: it seems to be trying to "normalize" the scale of phenomenon Magnitude against the scale of time horizon for counting those phenomenon Events. I'm imagining Earthquake Size vs Frequency.)

Here's the text: ===== The quantity in question is the "rescaled range R/S",

which is essentially the range  $R(\Delta-t)$  of the data over the time interval  $\Delta-t$ .

...

For a white Gaussian noise, the ratio R/S tends to be constant, for large  $\Delta-t$ .

In a sense , both R and S measure the range of data, but R "looks" at the data linearly and S is based on the squared data.

For some processes this yields no new information and R/S is ... constant, that is proportional to  $\Delta-t^0$ .

This is not so for numerous geophysical records, such as floods, ...

For a Brownian function R/S is proportional to  $\Delta-t^{0.5}$ , reflecting the long-range dependence, or "persistence" hiding behind the brown process. ..."

[Scatter charts:

X: Time (Log scale: 1 to 10000)

Y: "R/S" (Log scale: 0.1 to 1000)

Event Points: such as Floods tend to fall on a diagonal line which has the slope of the  $\Delta-t$  Exponent; Example: the records of Nile River Droughts for instance has a slope of 0.9 ]

"The Hurst exponent, defined by  
 $H = \log(R/s) / \log(\Delta-t)$ ,  
is a convenient measure of the persistence of statistical phenomenon."

=====

["Fractals, Chaos, Power Laws" M. Schroeder, pg 129-130]

Clear as mud eh?

Isn't technical math fun?

Seems like this may have something to do with normalizing events on different Time Scales?

It seems the linear lines in the R/S vs Time plots are "ironing out" what we normally consider jagged Fractal Phenomenon into what appear to be "straight lines".

later

James =====

### **Re: Z-Scores: Hurst Distributions**

Date :8/8/2005 1:51:28 PM Poster : James Siebert

some more geeky details on Hurst Distributions

Definition: =====

Hurst Exponent: A measure of the bias in Fractional Brownian Motion.

$H = 0.50$  for Brownian motion.

$0.50 < H < 1.00$  for persistent, or Trend-reinforcing series.

$0 < H < 0.50$  for an anti-persistent, or mean-reverting system.

The inverse of the Hurst exponent is equal to alpha, the characteristic exponent for Stable Paretian distributions.

The fractal dimension of a time series,  $D$ , is equivalent to  $2-H$ .

from <http://financial-dictionary.thefreedictionary.com/Hurst+Exponent>

=====

Concpetual Description:

=====

#### 2.1. "Fractal" Dynamics

The statistical paradigm against which the sequence of increments from a chaotic dynamical process is typically contrasted is that of a white noise process.

"White noise" typically refers to a sequence whose increments are independently and identically distributed with zero mean and finite variance.

Brownian motion, a well-known paradigm in finance, is a white noise process for which the independent increments are identically normally distributed.

A fractal time series is one which is statistically "self-similar" (apart from scale) regardless of the time frame over which the increments of the series are observed.

For example, a sequence of daily observations would exhibit similar statistical

characteristics to sequences of weekly, monthly, or yearly observations, and the scale of the observations would be a direct function of the length of time involved. Brownian motion, as a white noise process which exhibits these time series properties, is as Schroeder (1991) notes, "the paradigm of random fractals."

However, during the 1960's Benoit Mandelbrot, "the father of fractal geometry", believed that securities returns did in fact follow a fractal time series but that Brownian motion was not an adequate statistical description of the true stochastic process generating securities returns.

In order to resolve this inadequacy, Mandelbrot worked in two perpendicular directions to expand the class of fractal time series.

One direction involved relaxing the assumption of finite variance, which introduces what Mandelbrot termed the "Noah Effect."

The other direction entailed relaxing the independence assumption, thereby allowing for a "Joseph Effect."

The Joseph Effect (see Mandelbrot (1972)) is named after the biblical story in which Joseph prophesied that the residents of Egypt would face seven years of feast followed by seven year of famine.

This effect denotes the property of certain time series to exhibit persistent behavior (such as years of flooding followed by years of drought along the Nile River basin) more frequently than would be expected if the series were completely random, but without exhibiting any significant short-term (Markovian) dependence.

To describe such processes, Mandelbrot broadened the idea of Brownian motion into the class of stochastic processes called "fractional" Brownian motion (fBm), or, using the noise analogy, "flicker noises."

Fractional Brownian motions exhibit complex, though linear, long-term dependencies and are characterized by a parameter called the Hurst exponent (H), which denotes the level of long-range dependence in the data and generally ranges from 0 to 1.

If  $H=0.5$ , then the fractional Brownian motion will have no long-term persistence, and the result is standard Brownian motion, or white noise. ....

=====

from pg 1-2 of Pdf:

<http://scholar.lib.vt.edu/theses/available/etd-082799-103026/unrestricted/Chap2.pdf>  
(Note: the math here hits "rocket science" status, very quickly, though the intro is the best I seen yet on the subject of Hurst Distributions.)

later

James S.

### **Re: Z-Scores: Hurst Distributions**

Date :8/9/2005 12:15:08 PM Poster : Mark Simpson

On 8/8/2005 1:51:28 PM James Siebert wrote:

>The Joseph Effect (see Mandelbrot (1972)) is named after >the biblical story in which Joseph



Incidentally Mandelbrot released recently a new book called "(Mis)Behaviour of Markets". I purchased a copy a few weeks ago. It's a tough read with no specifics, but it does discuss Hurst and Normalizing Time. However he only has a way to simulate normalizing time, not to actually achieve it. It's also written in his usual flamboyant style and contains a lot of history.

It's worthy of reading it and putting on your Technical Analysis bookshelf up there with the 3 Ehlers books as it certainly helps with some of the concepts we have and will be discussing.

Mark Simpson Bowfort Technologies Inc.

**Re: Z-Scores: Hurst Distributions**

Date :8/10/2005 1:36:39 AM Poster : James Siebert

Still researching Hurst thru Google. starting to get to the real math behind it:

"Using the Scaling Analysis to Characterize Financial Markets"

[http://xxx.lanl.gov/PS\\_cache/cond-mat/pdf/0302/0302434.pdf](http://xxx.lanl.gov/PS_cache/cond-mat/pdf/0302/0302434.pdf)

Be sure to check out the Conclusions and Appendix in the pdf

I'm beginning to think a "Practical Hurst Score" might be obtained by tweaking the formula for the Gaussian Normal Curve (aka. Probability Distribution Function) since the Z-Score actually measures the probabilities under the various sections of this Curve.

<http://amsglossary.allenpress.com/glossary/browse?s=p&p=64>

The probability of Event x occurring within a sample population, which has a Gaussian Normal Curve distribution, is given by this formula:

$p(x) = \{ \text{sqrt}(N) / (\text{SD} * \text{sqrt}(2*\pi)) \} * \dots$

$e \text{ raised to } \{ [-N * (x - \text{mean}(x))^2] / [2 * \text{Variance}] \}$

where Variance is Square(SD) N is the sample size (ie Lookback window) Mean is the SMA of x in the Lookback window.

Not exactly simple, but not rocket science either Many of the terms can be created from NS Indicators. Looks to me we just need to figure out the "Hurst-way" to calculate Standard Deviation. (?)

Take for example, The probability of Event x (say Price Move +\$2) given the last 30 days where the Price has been range bound (+ or - \$1) [the context]

A ZScore for this would likely be in the +3 Tail region, (Because it takes 3x the Normal Variation [1SD] to get there)

however What would the Event x 's HScore be? if such "episodic" price run-ups, though uncommon, are NOT exactly rare occurrences?

Since the H-Curve distribution is probably "squatter" with "fatter" tails regions, "a Price Move of +\$2" should be MORE likely, (easier to reach) and may repeat in clusters, or in a "run-up" Epoch, (similar to an era of "price gain floods" [or a breakout Trend]) (such price-run examples exist: Google, Taser, Ebay, etc.)

Given such a sample, comprised of many "Epoch" price deltas, the Mean may skew towards the + side, and the H-Score may actually be LESS than +3 SD (more like 2.5) instead of greater than 3, with ZScore (given pure random population)

I've research "Skew" measures before, and they definitely seemed to pre-clude run up periods (or down periods for Neg Skews)

I'll let you know if I get anywhere with this

take care,

James Siebert

**Re: Z-Scores: Hurst Distributions**

Date :8/10/2005 12:32:47 PM

some more "real math" on Fractal Dimensions and

"Estimating the Hurst Exponent" (has lots of graphics)

[http://www.bearcave.com/misl/misl\\_tech/wavelets/hurst/](http://www.bearcave.com/misl/misl_tech/wavelets/hurst/)

It occurred to me also that the Student's t-test

may be another way to arrive at the same destination of calcing a Hurst-Score.

Since Student's t-test are designed to give you Squatter Distribution Curves with Fatter Tails (ie non-normal distributions):

Student's t-test (site has very good Intro to Stats)

<http://projectile.is.cs.cmu.edu/research/public/talks/t-test.htm#glance>

The actual Flood/Drought Epochs we see in Price data series

might be due to the "degrees of freedom" effect used in calcing Student t Deviations ??? (which are always > 1 )

The SD of a t Distribution is defined by:

$df / (df - 2)$

for instance a t-sample of 10 has a SD of 1.28 [ 9 / 7]

by contract a "Normal" Gaussian Distribution has a SD of 1.0

just my creative thought, for the day. ;)

[Note: here's "degrees of freedom" conceptual example:

If I tell you I need an average of 5, based on any 4 random numbers, What numbers can I use to get this result?

you can "freely" choose the first 3 out of 4 numbers for me (say 8, 3, -2) BUT that last number, given the 1st three, IS NOT FREE to be anything.

IE the Last Choice is determine by the 1st Three Choices aka my sample of 4 Numbers, in this example, "has 3 degrees of freedom".  $df = (n - 1)$

Question: what must that last choice be?

$$(x + 8 + 3 + (-2)) = 20$$

$$x + 9 = 20$$

$$x = 20 - 9$$

$$x = 11$$

the average of  $(11 + 8 + 3 + (-2)) = 5$

end of example]

Bottom line is ZScore assumptions (data has 0-Mean, & Variations of 1 SD)

May NOT always accurately describe the Data Series in question and a new way of calcing this comparison metric may be appropriate (Hurst Exponent, Student's t-test, etc)

James Siebert

**Re: Z-Scores: Hurst Distributions**

Date :8/10/2005 12:42:24 PM

Maths & Computers for Biologists

<http://www-micro.msb.le.ac.uk/1010/default.html>

(this site is the one with the very good intro to Stats, previous link was more of advanced Stats material)

...remember statistically, anything's possible...

James Siebert

**Re: Z-Scores: Hurst Distributions**

Date :8/10/2005 4:18:52 PM

On 8/10/2005 1:36:39 AM James Siebert wrote:

>I'm beginning to think a "Practical Hurst Score" >might be obtained by tweaking the formula >for the Gaussian Normal Curve Incidentally, Ehlers mentions the Fischer Transform for making non-normal distributions normal in one of his books, which maybe another approach or of some use to you (although I haven't gone into the math in much detail).

I like your approach regarding the Hurst approach, I can't wait to see the results.

Mark Simpson Bowfort Technologies Inc.

**Re: Z-Scores: Hurst Distributions**

Date :8/16/2005 2:16:05 PM

Key Principles:

Time Series Price data usually behave as if they are in 1 of 3 Modes:

1) "Random Walk" Behaviour:

Hurst Exponent = 0.5

Model: Flip a "fair" coin (50/50 odds H/T)

H: Price = Price1 +0.25

T: Price = Price1 -0.25

Assumption is that today's price move has "no memory" of yesterday's price move.  
(consolidation periods are difficult to predict)

2) "Persistent" Behaviour:

Hurst Exponent = greater than 0.5, up to 1.0

Model: Flip a "weighted" coin (70/30 odds H/T)

H: occurs 7 out of 10 times Price moves in SAME direction as yesterday's move (+-0.25)

T: occurs 3 out 10 times Price moves in OPPOSITE direction as yesterday's move (+-0.25)

Assumption is that today's price move is positively correlated to yesterday's price move(s)

(trends tend to persist, and continue)

3) "Reversion to the Mean" Behaviour:

Hurst Exponent = less than 0.5, down to 0.0

Model: Flip a "weighted" coin (30/70 odds H/T)

H: occurs 3 out 10 times Price moves in SAME direction as yesterday's move (+-0.25)

T: occurs 7 out 10 times Price moves in OPPOSITE direction as yesterday's move (+-0.25)

Assumption is that today's price move is negatively correlated to yesterday's price move(s)

(cycles tend to correct, and reverse)

Many researchers believe that stock markets

predominantly exhibit Hurst Exponents between 0.5 and 1.0. (persistence behaviour, where prices have some degree of "memory" or "momentum" of the recent past)

["auto-correlation" is the technical term, which uses math that is similar to TDNN in concept]

This is supposedly due to Fractal properties of Time Series data, when observed with respect to many different Time Scales. (for example when comparing SMA(50) to SMA(200) etc)

Put simply: Price Moves DO NOT usually behave like they are following a "fair" coin flipping model. There is something other than "pure chance" at work here!

(Of course we all knew this already, or else we probably would not had purchased NST ;)

I'm currently researching how to measure the Hurst Exponent directly as opposed to taking the Statistical Curve tweaking approach.

I discovered I needed to understand the metrics and what was being sampled in Hurst analysis, before I could see what to tweak within the Gaussian Model.

cheers

James Siebert

**Re: Z-Scores Hunch some Follow-up Tests**

Date :8/9/2005 12:01:59 PM Poster : Mark Simpson

>Isn't technical math fun?

>Seems like this may have something >to do with normalizing events on different Time Scales?

Correct. The math is ugly, but if you except the premise that markets are fractal in nature, then you have to fix the time base first (normalize time) before you

analyze them with fractal tools.

Also, check out fractal D, it can be used to denote the complexity of the market you're modelling. Essentially the higher the fractal D, the more variables you need to build a model. Or alternatively just trade when fractal D is low for instance.

I.E. If you're sampling things, then you want to sample them on a regular basis. People assume because a clock ticks on a regular basis, i.e. it's linear process, then markets trade on the same basis and then they execute their indicators on this linear timebase.

Or another way of looking at it is, if there was a river and we need to measure effects on the banks of the river by erosion etc., would we get better result, by just sampling every minute, or would we get better results by measuring the flow rate and using that to denote our measurement?

Mark Simpson Bowfort Technologies Inc.

### **Re: Z-Scores Hunch some Follow-up Tests**

Date :8/3/2005 1:10:21 PM Poster : Marcel  
James,

Thanks for the additional comments and the directions you are giving wrt Market\_Mode. I came to the similar conclusion years ago, but never could afford the time to further explore this path.

At this point in time, I however feel the need to make a few steps back, to simplify a bit this discussion and decompose it in digestible pieces: Let's assume that either a) we are focused on an instrument that follows purely a cycle (or a trend) mode, or b) we have a separate system that is able - for a particular instrument to distinguish the cycle from the trend phases. How do we build the 2 subsystems that can independently and successfully generate signals for those two modes?

Personal note: When implementing a NN, sooner or later I find myself doing fuzzy "trial and error", and I'd so much like to manage the process in a more structured manner. In other words, I honestly don't yet feel comfortable of mastering the process and be able for example to build these 2 independent subsystems, so that they deliver expectable results. I may be looking for inexistent perfection, but I'm sure many other (silent) forum visitors are having (or had) this same experience.

Best  
Regards  
, Marcel

### **Re: Market Mode and Decision Rules**

Date :8/4/2005 1:02:48 AM Poster : James Siebert

Here's the basic "floorplan" I've come up with when I'm building a TS that can handle, as you say "2 subsystems that can independently and successfully generate signals for those two modes" (both trend & cycle signals at the same time.)

The Stages: 1) get the materials, 2) build the structure:

1) At minimum, I get (build) 8 True/False indicators and

2) then combine them with OR & AND (Boolean operators) to create signals which tell me whether to Enter or Exit a position.

NOTE: this "Decision Rule" system is largely the result of my 15+ years of programming for a living.

TS system may not look obvious at first, and can take some tweaking, especially on the Exits, But this methodology can result in "Mode Trades" that do not step on each other, and work concurrently. :)

Of course the timelessness of the Position Switches based on the Mode Signal changes, will only reflect the Quality of you Mode indicator.

(VHF is an easy one to start with; Vertical Horizontal Filter)

Get the materials:

===== Get at least 8 True or False indicators ===== Each of these Indicators should evaluate to 1 or 0

MARKET MODE ENTRY:

1) TrendMode = using your favorite Mode Indicator 2) CycleMode = using the same Mode Indicator

(I sometimes use "TrendMode = 0" to indicate "CycleMode". It's important that the Trend and Cycle Modes do not overlap)

TREND ENTRY/EXIT: (will combine with TrendMode)

3) Bias\_Long\_SMA = Is Price less than the SMA of Price? (then likely to go up)

4) Bias\_Short\_SMA = Is Price more than the SMA of Price? (then likely to go down)

CYCLE ENTRY/EXIT: (will combine with CycleMode)

5) Reversal\_Long = Did your Momentum Velocity just go from + to - slope (0) 6)

Reversal\_Short = Did your Momentum Velocity just go from -to + slope (0)

MARKET MODE EXIT: (use as Exit Signal only)

7) 1stTrend = If 1st Day of Trend: Exit any Cycle-based position 8) 1stCycle = If 1st Day of Cycle: Exit any Trend-based position

(these last 2 are harder to construct, and to harder to see in action, but basically these Single-Spike Flags indicate the End of one Mode and the Start of the next Mode. (ie. time to close last "mode position", and start the next one.)

=====

Build the TS Structure:

===== Combine the 8 True or False indicators ===== with Boolean Operators (AND & OR) =====

NOTE: the combined Indicators must still evaluate to either True or False, when joined together in "Compound" Decision Rules:

LONG ENTRY: (any 1 is True)

TrendMode AND Bias\_Long\_SMA ==> (1 & 1) GoLong CycleMode AND

Reversal\_Long ==> (1 & 1) GoLong

LONG EXIT: (any 1 is True)

TrendMode AND Bias\_Short\_SMA =====> (1 & 1) ExitLong CycleMode AND  
Reversal\_Short =====> (1 & 1) ExitLong 1stTrend =====> (1)  
ExitLong 1stCycle =====> (1) ExitLong

SHORT ENTRY: (any 1 is True)

TrendMode AND Bias\_Short\_SMA =====> (1 & 1) GoShort CycleMode AND  
Reversal\_Short =====> (1 & 1) GoShort

LONG EXIT: (any 1 is True)

TrendMode AND Bias\_Long\_SMA CycleMode AND Reversal\_Long 1stTrend  
=====> (1) ExitShort 1stCycle  
=====> (1) ExitShort

Using just "half" of this system work as well (just Long Trades, or just Short Trades)

=====

NOTES on System Flexibility and Tweaking:

- 1) I'm constantly looking to improve the 8 T/F Indicators, especially the Market\_Mode Indicator
- 2) Including 1stTrend and 1stCycle Exits, usually results in more trades with less downdraft.
- 3) Removing 1stTrend and 1stCycle Exits, usually results in longer trades with more Gains.
- 4) Combining 1stTrend and 1stCycle with NOT (Bias\_etc) indicators, can make them more precise. (ie. Exit trigger fires less)
- 5) It's helpful to have a TrendMode Indicator that can distinguish between UpTrendModes and DownTrendModes (although the Bias Indicator's (3 & 4) recommended by Ehlers, do a pretty good job of Predicting Direction, depending on SMA window. Also I've that Parabolic SAR, can work as a Bias Entry indicator as well.)
- 6) Momentum Reversal Indicator sometimes work better when reversed (Short for Long) depending on Window size used to create them, Qtr, Half, Whole, Fixed; and how Reversal is measured. (RMI can be a useful substitute here.)
- 7) If unsure how to get T or F ( 1 or 0 ) Indicators; Hint I mostly use "Relational" category for these.
- 8) The Compound Rules can be made more complex (like checking for 1 of 2 different Bias Indicators, using OR.)

This is just the basic Floorplan, but the design can be customized to suit your Indicator preferences.

=====

Marcel, I hope that helps. I've developed this TS strategy over many, many weeks, of hard work, and am slightly hesitant to post it.

BUT in the spirit of information sharing and synergy there you go ... gratis.

Marcel, pour vous,

can you give me a brief summary on how you've been building and testing 0-lag indicators. Is TDNN the primary way to verify 0-lag?

BTW How's trading going for you? I've got "writer's block" on getting started, here. No TS seems "good enough" so far.

stay curious

later

James



## Heisenberg, Filters and Lag

Date :8/1/2005 9:52:54 AM

So far we now know how to use neural nets successfully and we have a plan to design a model. We have the exits figured, but we still need a 3 bar lag at most or 0 bar lag ideally, indicator for entry to make a system that we would trade. (We consider 4 bar lag entry and 0 bar at exit, a marginal profit case, so 3-0 is what we're aiming for, 0-0 is ideal, and you could argue is something you approach not reach).

The question becomes, how do we achieve this, and to do that, the first stage is to truly understand lag. Once we understand lag, we can figure out how to identify zero lag indicators.

So, what is an regular indicator?

Most of the time, an indicator is really just a filter. E.G. SMA, RSI. You feed data into a filter, and filtered data comes out of a filter. The filter normally has some effect, i.e. it smoothes the data/removes noise, or has some other predetermined effect so essentially its function(inputs)=output where inputs is the input data plus lags of the inputs, and output is the filtered output.

For instance a Simple Moving Average (SMA) of close and of say 5 periods is:

$(\text{close} + \text{Lag}(\text{Close},1) + \text{Lag}(\text{Close},2) + \text{Lag}(\text{Close},3) + \text{Lag}(\text{Close},4) ) / 5$

On a side note here, you can immediately see the similarity to a TDNN mentioned earlier. I.E. You could build a TDNN neural network to imitate practically any filter/indicator out there, after all a TDNN is just the same, the only difference is it learns the function instead of being given a mathematical expression for the function. I leave this as an exercise to simulate say something like RSI with a TDNN. When you create a TDNN to implement a function, you can also think of it as just an indicator builder, i.e. you have the ability to create any indicator automatically and the neural net constructs the best one for the job.

Filters are used regularly in electronics (long ago in analog, and commonly in digital these days), and what we're really doing here with our indicators in NST is digital signal processing (DSP). I.E. We're using mathematical techniques to implement our filters instead of analog techniques (electronic capacitors/resistors/inductors etc.)

If you consider price to be: signal+noise Then filter(signal+noise)=signal

Now, when we start thinking of indicators as really filters, a few things start falling into place.

First of all, we can use most DSP techniques in our models. We can also use analog techniques but convert them to digital. This opens up a new realm of indicators that we either don't see often, or aren't currently used at all in technical analysis. The issues in DSP are very similar to trading. Often they want to remove noise, often reduce lag (or adjusting for phase), deal with quantization noise (in our case quantization noise is 1 bar at any timeframe). Other areas that use DSP heavily are astro physics and computer vision amongst many disciplines, and many techniques can be borrowed from these areas.

Secondly, it's lag. Filters used for smoothing generally exhibit lag. It's a fact of life and stems from the Heisenberg Uncertainty Principle (HUP) (all you Star Trek fans, forget about transporters for a moment :-). HUP can be applied to many areas of physics, but how it applies to us is as follows.

The HUP states that you can't achieve both accuracy in the frequency and time at the same time. One is traded off against the other.

In terms of trading, frequency is the signal we're trying to get to without the noise, e.g. the output of an SMA is the signal. Time is the location of the feature within time, i.e. lag. 0 lag means we have accuracy in time, but then we don't have a signal (accuracy in frequency). 4 bars lag on an RSI means we have inaccuracy in Time (we have lag), and are accurate in frequency (the RSI output).

You can have either/or frequency/time, but not both, and you can have different levels or trade offs inbetween.

An exercise to look at lag is to take the ZSineWave from earlier and feed it into an SMA. Try:

1. Adjusting the frequency of the sine wave. You'll see the sine wave become attenuated at certain frequencies. Any pattern?
2. Looking at the lag. How much lag does the SMA add? How much phase is that equivalent to?
3. Do other indicators have the same lag. What's the minimum lag you can get?

So essentially we have a fixed physical limit, and a big problem. We must get rid of noise and get to the signal with zero lag. We need zero lag, because we need to model the most recent bar on the chart. We already know that most indicators produce a minimum of 4 bars lag, and that won't do.

We know from earlier that with a cause and effect model, that we're modelling the effect when we model price, so we're already late to the party. We don't want to be additionally late due to our indicators, so we need to approach zero lag.

I regard the HUP as a brick wall. Many people drive along a road and stop at the brick wall. The brick wall is fixed and can't be moved. The majority of people look at the brick wall, analyze its mortar, try pushing on it, try figuring out techniques to dissolve the brick wall. A JCB could knock down the brick wall, but we don't have a JCB in this analogy :-). The reality is it's a brick wall and the brick wall is fixed, and a physical limitation. (and I've spent many hours trying to get through that brick wall too)

So, now I've thoroughly depressed you, don't give up Technical Analysis yet.

The point is, forget about trying to push through the brick wall....

How about just going around it?

There are 4 classes/techniques I'm aware of (there maybe more, others who know them, please contribute) that you can use to go around the wall. Some are relatively easy to use, some are more complex.

1. Deal with HUP. If we need accuracy in the time domain, then we have to forego a signal and acquire one via another means. I.E. Look for our answer by analyzing with inaccuracy in the frequency domain and accuracy in time domain, or some level inbetween. Wavelets for instance allow you that trade off. This approach is commonly called Multi-Resolution analysis and tends to be complex. It's an area my research is currently targetted in, but is something that I keep close to me.
2. Probability. James did a good job of introducing this topic. Essentially probability is the likelihood of something happening. The strongest use of probability based

indicators tends to be using a contrarian view point. This is because contrarian is zero lag. I.E. You take the opposite position while price is going in a certain direction. The stronger the likelihood, the the more sure you can be of the result, but the less signals you get. You'll never be 100% accurate (and I don't believe any technique ever could be), but having 80% confidence can be very good, and it allows you to tune your system to provide the best.

3. Data Relationship Some stocks can lead others, i.e. one stock moves, another might move a few days later. Changes in the price of oil could have a knock on effect on retail. Correlation between certain stocks could be high (correlation pairs), such that when stocks become uncorrelated you can be reasonably sure they will return to correlation and you can trade that move. These are all "relationship" types, i.e. series1 leads series2. Because you know the relationship between the 2 series, then you can predict series2 from series 1 and you've removed lag. It can be tough to find these relationships and the obvious ones are often traded away, but if you dig deep enough you can find them.
4. Model Cause Forget trying to model the cause (price) and model the effect (the dynamics of all traders working in different timeframes). Fundamentals also slot in this category. (however bear in mind the data for these can be late). Again, it's another area that can be fraught with difficulty because of the amount of analysis involved.

Out of 1,2,3,4: 1&4 are the hardest to achieve. and 2 is easier than 3, so unless you have an indepth view of the market that makes 3 easier, it's quite often easiest to begin with the probability class type trades.

Mark Simpson Bowfort Technologies Inc.

**Re: Heisenberg, Filters and Lag**

Date :8/1/2005 6:29:38 PM

Mark

Thanks for the great summary of the system plan the group has been working on. It's given me a chance to catch up.

I particularly like the "Brick Wall" analogy for HUP, and the "go around it" solution. (teleporting?)

Wavelets seem to be a good compromise between the Freq & Time dimensions. (the math is perplexing though)

here's the link that 1st helped me understand Wavelets:

<http://users.rowan.edu/~polikar/WAVELETS/WTtutorial.html>

I like your decomposition of SMA into a trainable TDNN. Wow! great insight. I'll have to explore this.

A few days ago I applied TDNN you described to to Elher's "0-Lag Smoothed Momentum" using the Q's and got the best gain on the QQQQ I've ever seen: (89% annual gain)

SimpsonLag\_EhlersMomentumSMAqZ 010\_A QQQQ TS2 89.cht

( File not included, because of DLLs )

as I read it, Ehler's Algorithm is:

EhlersMomentumSMAQtr:

VariableMomentum(VariableSMA(Close,QtrCycle),QtrCycle)

[MESA Book pg 50-51]

Thanks for the concept of TDNN, I was not thinking in these terms before.

Mark you described a possible solution as:

> 3. Data Relationship > Some stocks can lead others, i.e. one stock moves, another might move a few > days later. Changes in the price of oil could have a knock on effect on retail. > Correlation between certain stocks could be high (correlation pairs), such that > when stocks become uncorrelated you can be reasonably sure > they will return to correlation and you can trade that move. These are > all "relationship" types, i.e. series1 leads series2. Because you know the > relationship between the 2 series, then you can predict series2 from series 1 and > you've removed lag. It can be tough to find these relationships and the obvious > ones are often traded away, but if you dig deep enough you can find them.

Here's a xls I put together a few months ago which illustrates such a Leading Correlation

[Euro Yen Dollar LinXY.zip](#)

Euro had a very strong leading relation on the Dollar  $R^2 = 0.824$  (SEE: 4th Chart down)

NOTE: this correlation was for 100 days in 1999

Used Pearson XY Correlation to determine if a move in the Euro resulted in a equivalent move in the Dollar.

The predictive strength of the Euro delta (X axis) in fore-shadowing the opposite Dollar delta (Y axis) as indicated by the tightly grouped scatter points around the diagonal Correlation Trend Line. (neg Slope)

The more widely dispersed the x-y points (Euro:Yen) the less predictive influence a move in x will have over a move y.

(Correlations > 0.7 indicate strong Probabilities with 90% confidence levels or better)

ANOTHER possible Zero Lag Indicator may be "Cluster Analysis" (the Charts at the bottom of Xls show such Clusters)

About 6 months I spent several weeks exploring this.

The math was messy, but the results were very good. And the Clusters could be optimized as well, (after a lot of perspiration setting up ranges).

"Cluster Analysis" is a well established Data Mining Technique.

Figuring out how to apply principles to Time Series Market data was a trick, however.

The basic Idea is, that Events in an X-Y Scatter Chart tend to group together into "similar Population" subsets, (aka Clusters.)

Such Clusters tend to share similar properties. (ie. same signal)

If you've ever seen the Star Chart

that classifies Stars into Giant, Dwarfs, Normal, etc. based on Luminosity vs

Temperature, then you've seen "Cluster Analysis" at work. (SEE Link: for Hertzsprung-Russell diagram)

[http://www.clustan.com/clustering\\_v\\_decision\\_trees.html](http://www.clustan.com/clustering_v_decision_trees.html) (Site has a good description of "Cluster Analysis" )

The idea is to isolate the ranges of the properties which identify "similar Events" (or types of Stars)

I found that by normalizing X Data Series and Y Data Series, using Z-Scores (of course)

then by using simple Circles, centered at (+1SD),(-1SD) I would have a mechanism for measuring "similar Price Events" (x-y Events)

(and a way to take advantage of any Leading Correlations, Like Increase in Euro ==> Decrease in Dollar)

By counting Events which "hit" within the Circle and optimizing what the Circle radius should be (in units of SD), using NS training.

Then Tradable Triggers and identifiable signals, can be built into a concise system of rules.

NOTE: I was able to simulate the Cluster Boundary using Pythagorus Distance formula, centered at (+1SD),(-1SD)

Given any Event x and y how far is (x,y) from center C? Is that distance less than the Circle Radius (at Cluster1 (+1SD,-1SD))?

if so, then tally another Cluster1 Event and so on. this can Result in early identification of trend changes, counter-trend strength etc.

later

James

### **Re: Heisenberg, Filters and Lag**

Date :8/7/2005 1:18:35 PM Poster : Mark Simpson

On 8/1/2005 6:29:38 PM James Siebert wrote:

>Wavelets seem to be a good compromise >between the Freq & Time dimensions.  
>(the math is perplexing though)

It does tend to be ugly. One of the main issues with wavelets is what you pick as the mother wavelet. However the mother wavelet still starts/ends at 0 which means that you get End Point Distortion and HUP is the limit. The EPD essentially varies according to the scale of the wavelet.

Also, because it's analyzed in terms of a mother wavelet, then the result is in terms of a mother wavelet which can be difficult to use.

>Here's a xls I put together a few months ago >which illustrates such a Leading Correlation >Euro had a very strong leading

You're a wiz with excel, and the analysis is sound. Try it out in NST, you'll find NN's do quite well with leading correlation type models. If you don't want to use clustering, there's a clustering add-on that will likely do the trick too. Nice work.

Mark Simpson Bowfort Technologies Inc.

**Re: Heisenberg, Filters and Lag**

Date :8/8/2005 1:49:56 AM Poster : James Siebert

Mark

Thanks again for looking at the correlation xls and taking time to comment.

Yes, you might say, that I "excel" with Excel. (chuckle, sorry)

Indeed I find Excel to be a very powerful tool for brainstorming, prototyping, and visualizing concepts. There are times I wish NST was more like Excel, but I imagine there are many very good reasons why it isn't.

A WYSIWYG chart-like view of before/after NN Solution Landscapes would be VERY cool, in NST, but that's probably expecting too much, given the limits of 3-D Graphics. However, being able to "post back" optimized parameters calcs, as new Indicator SubCharts, right from the Results Tab, is probably very do-able. (this is a task, that I always want, but rarely do)

I frequently build my ideas in Excel first, to see if the idea has any merit, and what the formula should be, and then rebuild the calcs in NS to validate the theory.

Re: correlation analysis xls.

I was very amazed when I saw the Euro was negatively correlated the Dollar, to such a significant degree; It was predictive even 3 days in advance (see the Charts down and to the right, and check Chart Titles, for Days Lead.)

I did at the time, try to do something with this in NS, but jumped straight to TS (skipping NN) and was primarily focused on using X:Y Correlation Rsq Scores ( $\geq 0.7$ ) as a triggering threshold for Trade Entries.

Now I think I might of been off track with this approach. I couldn't get consistent results, at the time, with just the Correl Peaks above a certain threshold. (frequently the Rsq drops below 0.7 on a day to day basis, (not sure why?) and by itself Rsq tells you nothing about the direction or timeliness of the move.)

I should look at this some more, especially since I learned that intermarket Correlations can be a source "untapped" Zero-Lag trading systems. :)

Thanks for the tip about Cluster Analysis Add-on; I will need to find out more this tool, as well.

James S. =====

**Re: Heisenberg, Filters and Lag**

Date :8/7/2005 6:52:10 PM Poster : Marcel

Mark et al,

Sorry for having been quiet for a few days... had to digest HUP!

Although I think to have a good understanding of HUP from an academic perspective, I needed in-depth practical experimentation (something Heisenberg didn't like at all) and proof that the principle applies. Maybe it's because I've spent months and months trying to find inexistent solutions, but facing and accepting the evidence was quite struggling this time. I didn't want to give up that easily in front of the "brick wall" and I had to pay my own tribute.

For anyone who stands in front of the wall wondering what to do next, I can only advise to experiment as much as possible – reading or listening to others won't probably

provide the necessary confidence that you learned your lesson. For me, I've taken simplified time series like the modulated sine curves and I've started to test one indicator after another, until I learned that there is no conventional way one can gain high probability about future price direction (buy/sell signal) without introducing this killing lag of 3-4 days. If you don't believe in it yet, take all your unsatisfactory models and lead the inputs by 1 or 2 days – you will be surprised!

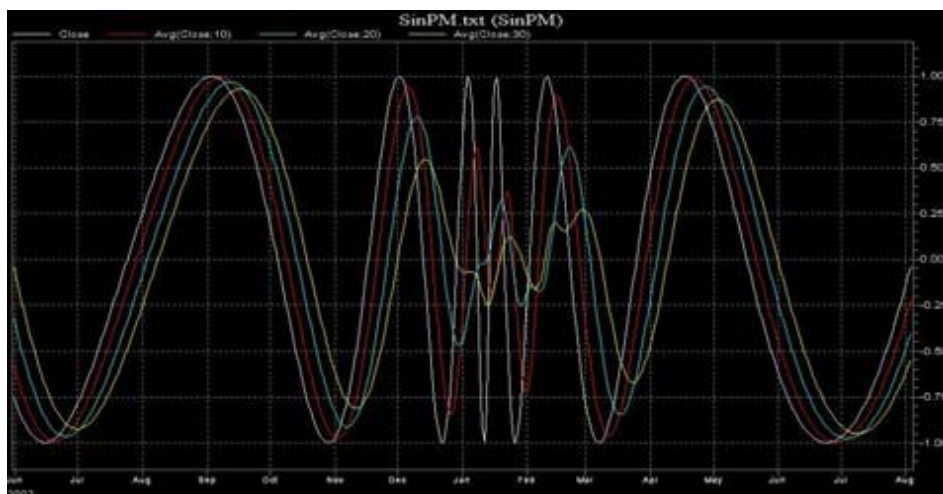
Despite my own HUP lesson, I still questions myself: What do the hundreds of people out there that claim to be successful with NN really do? Next to all those that give up before ever having had one single working model, I assume that the majority of them are sitting there by the brick wall, some of them fighting hard to get through. And yet some of them claim to be successful... Are their models only lucky shots? Or did they find a hole in the wall? If I read the "Interviews with Real Traders" on the NeuroShell.com site, I can hardly believe they have all gone around the wall...

What's your opinion on this?

Now a few replies to the original article:

- > An exercise to look at lag is to take the ZSineWave from earlier and feed it into
- > an SMA.
- > Try:
- >
- > 1. Adjusting the frequency of the sine wave. You'll see the sine wave
- > become attenuated at certain frequencies. Any pattern?
- >
- > 2. Looking at the lag. How much lag does the SMA add? How much
- > phase is that equivalent to?
- >
- >3. Do other indicators have the same lag. What's the minimum lag you
- > can get?

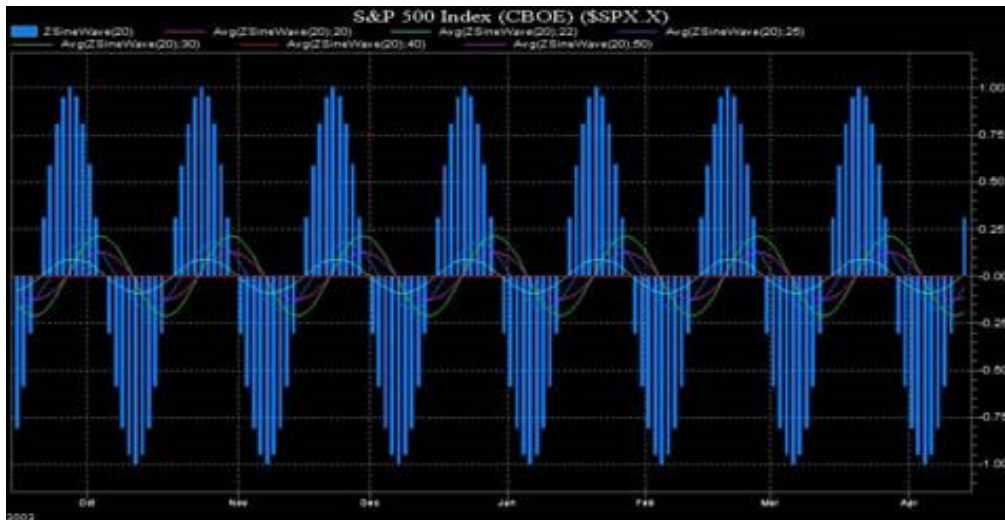
The above can be partially demonstrated by using one of the charts I posted here in a previous article ([http://www.ward.net/cgi-bin/Forum/Forum\\_Article.asp?a=2591](http://www.ward.net/cgi-bin/Forum/Forum_Article.asp?a=2591)). By adding a 10, 20 and 30 days SMA to the phase (or frequency) modulated sine wave, we get the following picture:



Two considerations become evident: a) The amplitude of the SMA is a function of sine

wave frequency higher frequency >> smaller SMA amplitude b) The amplitude of the SMA is a function of averaged period longer period averaged >> smaller SMA amplitude What is less evident but trained eyes will have observed, is that at high frequency the SMAs behave strangely, introducing something that looks like resonance frequencies (see yellow line at the center of the picture). It seems as if there are different phenomena going on when the averaged period of the SMA is greater than the sine wave frequency.

Let's look at another chart, a ZsineWave(20) plus SMAs of 20, 22, 25, 30, 40 and 50 days:



The observations are: a) All the SMAs are much smaller in amplitude, but reflect the same frequency as the underlying sine wave b) The 20 and 40 SMAs are not visible, being a multiple of the 20 bars underlying sine wave, they become zero c) The four remaining SMAs (22, 25, 30 and 50) have: c1) Different amplitudes, the closer they are to the base period of 20, the smaller they get – till zero (see b)); analogically, the 30 days SMA is the highest in the above example c2) But more interesting they are dephased from the underlying sine wave, does that mean that the conventional lagging theory gets messed up? Look at the SMA(22) for instance, it's exactly in phase with the underlying sine wave. Where has the lag gone?

(You will think now: “If only stock prices charts would look like sine waves...”)

Well, let's look at the lag then. Plot SMAs of 4, 6, 8, 10 etc. and you will see that the lag is roughly  $0.5 \times$  averaged period of the SMA. The more the averaged period gets closer to the sine wave period, the more their amplitude tends to zero – when greater, they resurge from zero with an inverted shape.

So, sorry to disappoint, but the SMA(22) above is nothing else than an inverted sine wave – unfortunately lagged by 11 bars, therefore useless for our objective of predicting!

How much phase does lag equate to for a SMA? If base period = 20 and lag = 2, Phase is  $360 \times 2 / 20 = 36$  degrees =  $\pi / 5$  radians. It follows (lc = lag coefficient): Phase (deg) =  $lc \times 360 \times \text{Averaged period} / \text{Base period}$



Phase (rad) =  $l_c * 2\pi * \text{Averaged period} / \text{Base period}$

Do all indicators display the same lag or lag coefficient  $l_c$ ?

Not really (empiric estimation averages based on sine wave - non representative):

- SMA = 0.45
- EMA = 0.25
- AMA = 0.30
- LinWgtAvg = 0.29
- Jurik MA = 0.28 I know the next one is theoretically wrong, but for sine waves the turning points are marked by the RSI with no lag. The problem is the curve shape, the RSI does not know that a turning point is about to happen, apart from extreme values 20 <> 80 = higher probability. It has however higher chance to be used for predictions (HUP at work). Jurik RSX is slightly lagged, but its curve reacts quicker to changes in slope or frequency.
- RSI = 0
- Jurik RSX = 0.1–0.3

Other conventional indicators fall either in the category of the moving averages with a lag coefficient of around 0.25-0.5 (e.g. Efficiency, Standard Deviations, Z-Score), or have a zero - or close to zero -lag coefficient (e.g. Simple Stochastics, Regressions) while introducing disadvantages as noted under RSI above, or simply can not be measured with sine waves (e.g. Momentum, Velocity, Acceleration, B-Bands).

I hope the above helps to move a step forward. Best Regards, Marcel

### **Re: Heisenberg, Filters and Lag**

Date :8/8/2005 5:15:36 AM Poster : Mark Simpson

You're wise in your approach and I can see now that you've truly got it (and pretty fast too).

It took me about 1 month to formulate the concepts in my head and probably around a year to be comfortable with it and identify solutions (the 4 methods I discussed in previous emails). There was a lot of double questioning of myself going on in that time. Essentially it's a completely new way of thinking about things, and gives you the ability to look at any model and say, "Yes this could work", or "No this definitely does not work". Then you can just concentrate on building the things that do work.

>Despite my own HUP lesson, I still question myself: What do the hundreds >of people out there that claim to be successful with NN really do? Next to >all those that give up before ever having had one single working model, I >assume that the majority of them are sitting there by the brick wall, some >of them fighting hard to get through. And yet some of them claim to be >successful... Are their models only lucky shots? Or did they find a hole >in the wall? If I read the "Interviews with Real Traders" on the NeuroShell.com >site, I can hardly believe they have all gone around the wall...

I think you'll find that many of the "Real Traders" on Neuroshell.com have actually gone around the wall, judging by limited information you can glean from their vague (of course they wish to protect their Intellectual Property) descriptions of their system. Sometimes people accidentally find their way around the wall without realizing the wall

is there, but they've been testing some methods/ideas extensively and noticed one of them works, and stick with it and develop it. These tend to be probability based, or based on some data series leading another. Statisticians/Mathematicians who put their skills to trading also tend to start off with probability based methods because of their familiarity with it and the methods, so are generally successful earlier on.

The other point is all these indicators don't seem to be much use, can be very useful if you feed a truly leading data series to them.

The other thing that goes on is curve fitting. Some people convince themselves that a conventional approach works by misusing the tools they have.

For instance (and we'll demonstrate this later in the curve fitting section), you can take any indicator (lets say an RSI for example), and genetically optimize to fit say 4 or 5 trades, and it will work very well. Now if you take say 10 indicators and put them into the model, you can now build a model validated on say 100 trades, and get good results with optimization. However it either works for a little while then stops working and they have to re-optimize, or it never works in real time.

Essentially you can piecewise linear fit a curve, and that process people sometime hit upon, but often don't understand why. That is one technique to make a conventional model work. Personally I have it on my "risky" list, purely because it's more difficult to produce on going results than with other techniques for getting around HUP. We'll go into that more on the section about curve fitting.

So overall, it's not all bad news. Most people are stuck at the brick wall, and we have to do a little more leg work to get around it. The people at the brick wall often think we're crazy, because the brick wall is what most people do, and masses must always be right. However ironically, we need to model the masses and to do this we need to be aware of what they're doing to get ahead (leading) of the masses.

Also, NST is an extremely powerful toolkit. Used in the correct way, these tools are dynamite. In my opinion it's the best toolkit out there. Practically any indicator you need has already been coded (even new ones in TASC), and you have serious neural networks and genetic optimization. However, like any extensive toolkit, you have to be careful that you stick your head up above it all and have a look around. The point being that it is way too easy to sit on the ground amongst your array of tools, trying to figure if this new tool you're learning is the single answer to the issue. You couldn't build a chair with just a hammer, and also if you need a clamp to hold the chair whilst building, only one clamp out of the 40 you have may work for the task in hand.

I'll reply to the rest when Ward have attached the images (probably Monday).

Mark Simpson Bowfort Technologies Inc.

### **Re: Heisenberg, Filters and Lag**

Date :8/8/2005 9:27:26 AM Poster : chris wong

i got over the brick wall marcel as soon as i realized the brick wall was only in my head. i used to think i had to find the keys to some magic kingdom where i'd discover the holy grail. then i came to understand that you have to see the glass as half full, not half empty. you have many somewhat good systems around you, stochastics, crossovers, simple neural nets, ideas on this forum, etc. together they are more than a full glass. the concept of diversified portfolios has been around for decades, why not diversify

systems by finding ways to make them work together or confirm one another, as well as apply them to a diversity of stocks? giving credit where it is due, i got this idea from the ai college, but i don't think mr. ward invented the concept, because it is also old. read example 6 to get going on the concept, but i found things don't need to be nearly as complex as example 6. once you realize there is no brick wall you realize making good systems is not rocket science - e pluribus unum.

### **Re: Heisenberg, Filters and Lag**

Date :8/9/2005 5:38:33 AM Poster : Marcel

Chris,

You are addressing an essential psychological aspect, the half full / half empty glass. Setting realistic expectations, managing drawbacks or cut losses are some of the fundamentals all of us have to deal with – while building our models, testing them and finally when they are implemented. I see the “holy grail” to be a nice dream at the very beginning, quickly moving into background when frustration and deception inevitably arises. Despite being replaced by other targets like technical challenges, personal education or researcher instincts, I believe it has to remain there as a nice dream, giving us direction and underlying motivation.

I also think there is not one single “brick wall”, all of us have our own one(s). Through discussion we can find similarities, and together we can quicker find ways how to circumvent or overcome them. In these past threads we have been discussing the HUP (Heisenberg Uncertainty Principle) “brick wall”, which is a very important eyes opener. I have a number of models implemented on the basis of example 6 which I trade, but for reasons stated previously I don't consider them to be behind this “brick wall”. I encourage you to go through all the articles posted here in the past 6 weeks, and if you think we are missing out something, please enlighten us.

Thanks, Marcel

### **Heisenberg, Filters and Lag: Lag Exercises**

Date :8/1/2005 10:31:24 AM Poster : Mark Simpson

Here's a few exercises that help figure out if an indicator is zero lag or lagging.

1. Z-Score. James has already mentioned that Z-Score is zero lag. But if it has a Simple Moving Average in it's calculation, and a Simple Moving Average has lag, then why is Z-Score zero lag?
2. Is RSI lagging or zero-lag and why?
3. If you were to sell short on  $RSI > 80$  would that be zero-lag?
4. Are bollinger bands zero lag?
5. If we smoothed a Z-Score, would that be zero lag?
6. If oil lead retail, and we did a RSI of oil and looked for extreme values of RSI would that be zero lag?
7. If we have an indicator  $Lag(SMA(Close,5),3)$  is that zero-lag?
8. If we created a crossover indicator,  $Crossover(price, Lag(SMA(Close,5),3))$  would that be zero-lag?
9. If we were to train a neural net to learn RSI, would that neural net be zero-lag?

10. If we had an indicator which provided the probability of price being a peak or valley, and a peak was  $Lag(Close,1) > Lag(Close,2)$  AND Close And here's some tougher ones:

- a) If we did an Fast Fourier Transform of price, would we have zero-lag?
  - b) Under what circumstances would a crossover be zero lag?
  - c) When can a zero-lag indicator be considered leading?
  - d) What technique do you use to make a lagging indicator zero-lagged?
  - e) How many neurons in your average ant (you've actually read this far? :- ) )
- Mark Simpson Bowfort Technologies Inc.

### **Re: Heisenberg, Filters and Lag: Lag Exercises**

Date :8/1/2005 8:56:57 PM Poster : Steve Eberbach

I have successfully used Z-score when using GRNNs which demand better normalizing. I convert most everything to Z-scores.

What is quite interesting is to use "future" Z-scores (as a target), whereby the daily fluctuation is zero lag, by virtue of using "today-unsmoothed" compared in relation to a future range defined by the standard deviation of future movement over an interval.. So the smoothed part is only a normalization, not entirely based on daily fluctuation. This is a useful target, I have found. Partly zero lag, partly leading. An exercise to bend your brain: Is a Z-score comparing 5-day smoothed close with future 5-day standard deviation of open, high, low, close from 5 day future smoothed mean zero lag? Negative lag?

### **Re: Heisenberg, Filters and Lag: Lag Exercises**

Date :8/1/2005 11:36:27 PM Poster : James Siebert

Here goes nothing, my educated guesses:

1. Z-Score. James has already mentioned that Z-Score is zero lag. But if it has a Simple Moving Average in it's calculation, and a Simple Moving Average has lag, then why is Z-Score zero lag?

Z-Score rates the likeliness of an Event (how unusual is it). Z-Score do not tell you where tomorrow's price is headed, like a SMA(5) would for 5 days ago.

Flip a coin 5 times in row, with all Heads, Z-Score(30) would be somewhere around 3 or more, but the next flip could easily be heads again, however probabilities says that the "mean will return" should lead you to bet on Tails.

2. Is RSI lagging or zero-lag and why?

Lagging, RSI calculation keeps averaging and carrying forward yesterdays values, then adding todays value to the mix.

The indicator has a "memory" of the past and today's up or down move, attempts to adjust that memory in today's direction, if only slightly.

3. If you were to sell short on  $RSI > 80$  would that be zero-lag?

I would guess Yes, since RSI "can't stay oversold forever" in other words it's likely to correct and revert to the mean (50) soon. (caveat, break out trends, can postpone the

correction)

4. Are bollinger bands zero lag?

I think Yes, since they rely on Standard Deviation and the "probability" of Prices returning from the outer Bands back to the Center Channel (0 SD), is very good.

5. If we smoothed a Z-Score, would that be zero lag?

No, averaging the Z-Score, would cause the smoothed line to follow the Z-Score direction but only "after the fact" ie lagged.

6. If oil lead retail, and we did a RSI of oil and looked for extreme values of RSI would that be zero lag?

maybe, if we are assuming the RSI correction from extremes would also occur in Retail RSI, shortly afterwards.

Would be better to you use Pearson X:Y Correlation between Oil and Retail, and determine which indicators are related. Maybe RSI is NOT the determining factor (X) preceding the Retail indicator (Y), but maybe it's the Oil Momentum Indicator that leads Retail instead

7. If we have an indicator Lag(SMA(Close,5),3) is that zero-lag?

NO, 5+3 days of Lag = 8 days of Lag.

Without the trick of 90 degree Phase-shift (QtrCycle Lag) Usually Lag + Lag cannot not be converted to Lead.

Qtr trick is due to the Identity of Sines and Cosines

$$y(t) = A \cos(\omega t + \theta) = A \sin(\omega t + \theta + (\pi/2))$$

Where  $\theta$  is Phase Angle change and  $(\pi/2)$  is the QtrCycle Phase shift (90 degrees) and  $\omega t$  is the angular frequency (rate of the cycle change)

8. If we created a crossover indicator, Crossover (price, Lag(SMA(Close,5),3)) would that be zero-lag?

Possibly Yes, depending on how it is used. Once a price crosses a Average line, it tends to stay there for a while, until the cycle progresses or the trend corrects.

I use CrossOver(Price, SMA(Price)) as a "Long entry bias" CrossBelow(Price, SMA(Price)) as a "Short entry bias" in conjunction with my MarketMode Indicator (for Trend)

If "Trend\_Mode" goes to True, I look at the "SMA Bias" to determine if Entry should be either Long or Short.

"A Price above Average tends to stay above Average" and v.v.

9. If we were to train a neural net to learn RSI, would that neural net be zero-lag?

Don't know, maybe 0-Lag? It could be that the Net learned to anticipate the "Return to Mean" behaviour, as it approximated/learned the "profitable" solution spaces.

10. If we had an indicator which provided the probability of price being a peak or valley, and a peak was Lag(Close,1)>Lag(Close,2) AND Close

This indicator would have 1-day lag, since the middle value out of the 3, is the one being estimated, as the peak.

And here's some tougher ones:

a) If we did an Fast Fourier Transform of price, would we have zero-lag?

No, we'd have the Frequency Components in the data, how often it repeats, but not when it will. (units of cycles, not days)

b) Under what circumstances would a crossover be zero lag?

when it's used as contrarian bet, as when the crossover of an extreme threshold indicates a likely return to the mean.

c) When can a zero-lag indicator be considered leading?

when it's in Cycle\_Mode and a Phase-shift is applied to project future Cycle stages into "leading info" now (see answer 7)

d) What technique do you use to make a lagging indicator zero-lagged?

1) pass it thru a Z-Score.

2) pass it thru Bollinger Band calcs.

3) find a Leading Correlated Indicator in another market which precedes the lagging indicator of interest.

4) Analyze it with wavelets, for both "some" Time and "some" Frequency data simultaneously. Wavelet minimize the HUP tradeoff between the Timeliness and the Accuracy of Signal data.

5) Find ways to minimize or reduce the Noise like  $(H+L+O+C)/4$  or maximize the Signal (like Momentum)

6) decompose the Lagging Indicator into component parts, add those to a Neural Net, so the context of the Lags can be "learned" and bought forward into the present.

7) 90 degree Phase-shift (Quarter Cycle shift) if market is in Cycle Mode  
likely more ??

e) How many neurons in your average ant (you've actually read this far? :-)

100 per ant x 100,000 per colony x goal-seeking behavior patterns = very intelligent action, for a dumb insect. ;)

### **Re: Heisenberg, Filters and Lag: Lag Exercises**

Date :8/5/2005 8:08:25 PM

>Here goes nothing, my educated guesses: >1. Z-Score. James has already mentioned that Z-Score is zero lag. > But if it has a Simple Moving Average in it's calculation, and a Simple > Moving Average has lag, then why is Z-Score zero lag?

>Z-Score rates the likeliness of an Event (how unusual is it). >Z-Score do not tell you where tomorrow's price is headed, >like a SMA(5) would for 5 days ago.

>Flip a coin 5 times in row, with all Heads, >Z-Score(30) would be somewhere around 3 or more, >but the next flip could easily be heads again, >however probabilities says that the "mean will return" >should lead you to bet on Tails. Correct. The way I see it is a little different. ZScore =  $(X - SMA(X,N)) / Standard\ Deviation(X,N)$

Where X is price and N is the number of periods. Essentially (because N is large and not 1), is:

ZScore =  $(X - Smoothed) / Smoothed$

I.E. SMA and Standard Deviation are both indicators which are a calculation on many

separate values, i.e. lag is introduced.

However X is zero lag (assuming you're using price).

So we really have:

ZScore = (0 Lag - P lag) / P Lag Where P is some amount of lag between say 0.5N and 0.25N (from earlier post).

Now from a maths point of view (and James being a statistician can likely put it together more formally than I can), the 0 lag component is the major component that effects the series, because P Lag changes slowly throughout time.

Therefore because it's the major component it effects the result more, therefore ZScore itself is zero lag.

>2. Is RSI lagging or zero-lag and why?

>Lagging, RSI calculation keeps averaging and carrying forward yesterdays values, then adding today's value to the mix.

>The indicator has a "memory" of the past and today's up or down move, attempts to adjust that memory in today's direction, if only slightly. Correct.

>3. If you were to sell short on RSI >80 would that be zero-lag?

>I would guess Yes, since RSI "can't stay oversold forever" in other words it's likely to correct and revert to the mean (50) soon. (caveat, break out trends, can postpone the correction) That's an interesting way of thinking about it, i.e. using a lagging indicator in a contrarian use to make it leading.

What I've found personally is that using something like Z-Score and then using contrarian is better because you have a zero lag (arguably leading) followed by zero-lag contrarian, rather than (with RSI) lag, plus then a zero-lag technique. I.E. RSI even when used in a leading sense, still contains a chunk of lag in it.

>4. Are bollinger bands zero lag?

>I think Yes, since they rely on Standard Deviation and the "probability" of Prices returning from the outer Bands back to the Center Channel (0 SD), is very good. I'd say yes and no. Because BBands are:

$SMA(X,N) \pm (\text{mult} * \text{StandardDeviation}(X.N))$

Mult is a constant. And SMA/StandardDeviation are not zero lag. That's the No.

The yes would be due to the same reasons as the last question. I.E. Contrarian use at a certain level, i.e. a BBand breakout, but again it would have the same issue with lag.

>5. If we smoothed a Z-Score, would that be zero lag?

>No, averaging the Z-Score, would cause the smoothed line to follow the Z-Score direction but only "after the fact" ie lagged. Correct.

>6. If oil lead retail, and we did a RSI of oil and looked for extreme values of RSI would that be zero lag?

>maybe, if we are assuming the RSI correction from extremes would also occur in Retail RSI, shortly afterwards. Correct. I.E. The RSI of oil, (which has an amount of lag, lets say for this example 4 bars), precedes the move in Retail by at least 4 bars to be zero lag.

>Would be better to you use Pearson X:Y Correlation between Oil and Retail, and determine which indicators are related. Maybe RSI is NOT the determining factor (X)

>preceding the Retail indicator (Y), >but maybe it's the Oil Momentum Indicator >that leads Retail instead Correct. Incidentally another thing that is worthy looking at is serial correlation within a stock itself.

>7. If we have an indicator Lag(SMA(Close,5),3) is that zero-lag?

>NO, 5+3 days of Lag = 8 days of Lag. Yes and no. If you take the indicator itself, the answer is a plain no. However it can be used as an effective trend exit signal. It's commonly called DMA (Displaced Moving Average) and seems a weird concept at first. Essentially you're displacing a 5 day moving average, and by doing that it gets you the responsiveness of a 5 day moving average, but can be used as a trend termination (or entry) signal because it's been displaced enough in time to move it out of the way of being whipsawed. Plot it on a chart and you see it can work for when price>DMA (or conversely).

>Without the trick of 90 degree Phase-shift (QtrCycle Lag) >Usually Lag + Lag cannot not be converted to Lead.

>Qtr trick is due to the Identity of Sines and Cosines

> $y(t) = A \cos(\omega t + \theta) = A \sin(\omega t + \theta + (\pi/2))$

>Where  $\theta$  is Phase Angle change >and  $(\pi/2)$  is the QtrCycle Phase shift (90 degrees) >and  $\omega t$  is the angular frequency (rate of the cycle change) Advancing phase will work, however you have to be careful to make sure that you have a good analysis of phase/frequency in the first place.

>8. If we created a crossover indicator, >Crossover (price, Lag(SMA(Close,5),3)) would that be zero-lag?

>Possibly Yes, depending on how it is used. >Once a price crosses a Average line, >it tends to stay there for a while, >until the cycle progresses or >the trend corrects.

>I use >CrossOver(Price, SMA(Price)) as a "Long entry bias" >CrossBelow(Price, SMA(Price)) as a "Short entry bias" >in conjunction with my MarketMode Indicator (for Trend)

>If "Trend\_Mode" goes to True, >I look at the "SMA Bias" to determine if >Entry should be either Long or Short.

>"A Price above Average tends to stay above Average" >and v.v. I accidentally answered that one in 7. (and your correct) :-)

>9. If we were to train a neural net to learn RSI, would that neural net be zero-lag?

>Don't know, maybe 0-Lag? >It could be that the Net >learned to anticipate the "Return to Mean" behaviour, >as it approximated/learned the "profitable" solution spaces. If you train a neural net to learn RSI, then it will have as much lag as RSI. However, you could always try to teach it Lead(RSI,4), but you're going to come up against HUP and the neural net will become very poor at predicting.

>10. If we had an indicator which provided the probability of price being a peak >or valley, and a peak was Lag(Close,1)>Lag(Close,2) AND Close

>This indicator would have 1-day lag, since the middle value >out of the 3, is the one being estimated, as the peak. Correct.

>And here's some tougher ones:

>a) If we did an Fast Fourier Transform of price, would we have zero-lag?



>No, we'd have the Frequency Components in the data, >how often it repeats, but not when it will. >(units of cycles, not days) Correct. Also (and this one is important if you're ever doing frequency analysis using FFT's for trading), an FFT has to start and end at zero, otherwise you get significant noise throughout the spectrum. Because of this a hanning window (or other window) that makes the data end (and start) at zero is commonly used. Unfortunately the area you want to model is the end point, i.e. the most recent bar. So you've just wiped out any possible chance of doing any reasonable analysis because you've introduced significant End Point Distortion (EPD) from the FFT requirements themselves.

>b) Under what circumstances would a crossover be zero lag?

>when it's used as contrarian bet, >as when the crossover of an extreme threshold >indicates a likely return to the mean. Plus, when you're crossing over a zero lag indicator.

>c) When can a zero-lag indicator be considered leading?

>when it's in Cycle\_Mode and a Phase-shift is applied >to project future Cycle stages into "leading info" now (see answer 7) Good thinking and right, but HUP is the gotcha.

>d) What technique do you use to make a lagging indicator zero-lagged?

>1) pass it thru a Z-Score. That would still be lagged.

>2) pass it thru Bollinger Band calcs. Still Lagged

>3) find a Leading Correlated Indicator in another market >which precedes the lagging indicator of interest. Correct.

>4) Analyze it with wavelets, >for both "some" Time and "some" Frequency data simultaneously. >Wavelet minimize the HUP tradeoff >between the Timeliness and the Accuracy of Signal data. Minor lag, but you get some distortion that has to be handled from the process itself.

>5) Find ways to minimize or reduce the Noise like  $(H+L+O+C)/4$  >or maximize the Signal (like Momentum) Momentum introduces lag however, as you normally need longer momentums to produce a usable signal.

>6) decompose the Lagging Indicator into component parts, >add those to a Neural Net, so the context of the Lags can be "learned" >and bought forward into the present. Good thinking.

>7) 90 degree Phase-shift (Quarter Cycle shift) >if market is in Cycle Mode A lot of the cycle mode/trending concept tends to come from the idea that things are consistent. I believe the issue here is are understanding of time (which I'll go into in later posts).

>likely more ??

>e) How many neurons in your average ant (you've actually read this far? :-) )

>100 per ant x 100,000 per colony x goal-seeking behavior patterns >= very intelligent action, for a dumb insect. ;) I checked this one out, just out of interest. A Cataglyphis ant has about 960,000 neurons which is pretty impressive, and I presume it varies a lot depending on the ant in question.

Incidentally in case you're wondering why we can't build an ant brain tomorrow. The issue is processing time. Neurons in living matter are relatively slow, but can all fire as a network as once, i.e. they all like individual basic processors that can all fire in parallel. On a computer you have a serial computer processing a parallel concept, so each

neuron has to be processed in turn. Though a computer neuron is much faster than the biological one, the serial processing makes any network of neurons of reasonable size a lot slower. And of course parallel computing isn't really up to the task either at this stage. Maybe in the future...

Mark Simpson Bowfort Technologies Inc.

**Re: Heisenberg, Filters and Lag: Lag Exercises**

Date :8/8/2005 3:15:35 PM Poster : James Siebert

> Therefore because it's the major component > it effects the result more, > therefore ZScore itself is zero lag.

So Why is Z-Score 0-lag?

If you use N = 30

(which I usually do with Z-Score since most statisticians consider 30 the minimum Sample Size, with a "good" degree of accuracy, around 90% Confidence)

and assume P lag is one half the N window:

$$P \text{ Lag} = 0.5N = 0.5 * 30 = 15 \text{ daysLag}$$

then

$$Z\text{Score} = (0 \text{ Lag} - P \text{ lag}) / P \text{ Lag}$$

becomes

$$Z\text{Score} = (0 \text{ Days Lag} - 15 \text{ Days lag}) / 15 \text{ Days Lag}$$

$$= -15 / 15$$

$$= -1$$

Not sure was this tells you?? ( a measure of probability? )

I always thought Z-Scores were 0-lag since they were measuring/predicting by using "probability",

and classic probability has "no memory" of the past (non-conditional Probability, with replacement).

or in layman terms: "each coin flip is independent of the last one"

A ZScore of +3 today, does not prevent me from seeing a -3 Score tomorrow.

This type of move is not so easy in a Lagging Indicator, like SMA:

There is a "certain inertia" that must be reversed within the SMA data series, for such a move. One day's Value cannot "move the curve" so quickly. There is a "degree of continuity" that must be maintained in the Indicator from Day to Day. (SMA is always "slow to react")

In the ZScore, each Daily Score is "discontinuous" from the last one. Z-Scores can vary "all over the map", although they usually don't.

What gives the ZScore its usefulness is its built-in "context". A ZScore is a "measure of variability" given the context of the last 30 Days. (or whatever N)

It's an "adaptive scale" where the ruler's always adjusting to the most recent data.

The variation it measures, tells you "how unusually is today's Value relative to the recent median value"

This unusual-ness is measured in units of Standard Deviation (SD). ZScores series tend to occur (distribute) as a classic "Bell Curve".

And a classic "Bell Curve" has:

68% of events happen between -1 SD and +1 SD 95% of events happen between -2 SD and +2 SD 99% of events happen between -3 SD and +3 SD and very exceptional stuff is < -3 or > +3 (Thin-tails)

If "Hurst Distribution" applies, instead of a normal "Bell Curve"

then we would likely have Distribution probabilities something like this (just my guestimates):

60% of events happen between -1 SD and +1 SD 90% of events happen between -2 SD and +2 SD 95% of events happen between -3 SD and +3 SD (Fatter-tails) 99% of events happen between -4 SD and +4 SD (Fatter-tails) and very exceptional stuff is < -4 or > +4 (Fatter-tails)

That's what I know about Z-Scores

I'm still trying to get a theoretical basis for the Math behind 0-Lag and P-Lag, which is new adventure for me. (and part of my motivation for taking part in the forum)

Mark thanks again for the constructive comments on the Quiz

James Siebert

### **Re: Heisenberg, Filters and Lag: Lag Exercises**

Date :8/9/2005 12:40:02 PM Poster : Mark Simpson

Z Score = Something with no lag minus something smoothed all divided by something smoothed. We know that something smoothed has lag, but we're looking at the global picture of what Z Score is, i.e. which is the major component that effects the Z-Score value.

Because something smoothed by definition changes by small amounts from bar to bar, e.g. an SMA changes by small amounts bar to bar, then from a "Bar to Bar" perspective, terms 2 and 3 (something smoothed) effect the bar to bar change of ZScore by a small amount. The only thing that effects the bar to bar change by a large amount is price itself (which is Zero Lag). So you can call it virtually "zero lag".

I know this sounds like a flimsy argument from the above and I'm sure there's a more formal mathematical way of putting it, but as they say, the "Proof is in the eating", so you only have to verify a ZScore against price to see that it is indeed zero-lag (i.e. peaks and valleys exhibit no lag).

Essentially what I'm looking at in my thinking is the major components in the indicator and how each contributes to lag, maybe we could come up with some kind of mathematical set of operations, i.e.:

(and these are just quick guesses)  $0 \text{ Lag} - N \text{ Lag} = 0 \text{ Lag}$   $0 \text{ Lag} + N \text{ Lag} = 0 \text{ Lag}$   $N \text{ Lag} * N \text{ Lag} = N \text{ Lag}$   $N \text{ Lag} / N \text{ Lag} = 1 \text{ Lag}$   $(N \text{ Lag})^2 = 2 * N \text{ Lag}$   $0 \text{ Lag} * N \text{ Lag} = N / 2 \text{ Lag}$

These set of operations would make it easier to formalize these definitions, by reducing indicators into these components above so you could figure out an indicators effect on lag.

If I'm still not being clear enough, let me know and I'll try to formalize the concept

another way.

Mark Simpson Bowfort Technologies Inc.

**MARKET MODE and Decision Rules (correction)**

Date :8/4/2005 1:15:15 AM Poster : James Siebert

James Siebert wrote:

[ at the end of TS Stage 2 outline ]

> LONG EXIT: (any 1 is True)

> TrendMode AND Bias\_Long\_SMA > CycleMode AND Reversal\_Long > 1stTrend  
=====> (1) ExitShort > 1stCycle  
=====> (1) ExitShort

This last Exit Block has significant TYPOS  
and should actually read:

SHORT EXIT: (any 1 is True)

TrendMode AND Bias\_Long\_SMA =====> (1)  
ExitShort CycleMode AND Reversal\_Long  
=====> (1) ExitShort 1stTrend  
=====> (1) ExitShort  
1stCycle =====> (1)  
ExitShort

Sorry for any confusion this may have  
caused.

James S.

**Re: MARKET MODE and Decision Rules (correction)**

Date :8/4/2005 11:21:42 AM Poster : James Siebert

James previously wrote:

>TREND ENTRY/EXIT: (will combine with TrendMode)

>3) Bias\_Long\_SMA = >Is Price less than the SMA of Price? >(then likely to go up)

>4) Bias\_Short\_SMA = >Is Price more than the SMA of Price? >(then likely to go  
down)

=====

I believe these Trend\_Bias Conditions (previously posted) may be stated backwards  
as well. (sorry)

I looked at some of my previous TS, and usually they GoLong if Price MORE than the  
SMA of Price, (not LESS) and v.v.

I tried to find the Ehler's reference for this, but could not locate it.

The TS Floorplan I present will still work, you just may need to try out different  
indicators as your Bias and Reversal Indicators.

The Point is This:

If I tell you (or your Mode\_Indicator tells you)

"The Market just went in Trend\_Mode, quick Enter a Trade",

What indicator would you use to tell you if that Trade should Go Long or Go Short?  
(without looking at the Chart)

What Yes/No indicator can you use TODAY, that will tell you the likely Direction of the Trend, which is starting today? (There are several)

Whatever indicator you would use THAT Indicator should become the basis your:

Bias\_Long\_MyIndicator Bias\_Short\_MyIndicator

(3 and 4)

Similar reasoning applies to to the Reversal Indicators, (used in Cycle\_Mode)

If told "the Market just went into Cycle Mode", what indicator would you use to determine if the New Position should be Long or Short? (besides looking at the chart)

This Floorplan should be customized to YOUR own preferences, think of it as your house, you need to be comfortable in the living space.

The TS floorplan has worked for me, it may work for you as well.

later

James

**Re: MARKET MODE and Decision Rules (correction)**

Date :8/8/2005 8:23:48 AM Poster : Marcel

James,

Thanks a lot for your detailed description on your "floorplan", really appreciate your candidness and generosity. As you can see in my previous post, I spent the past few days hitting my head against the "brick wall", just to make sure it hasn't become movable or breakable in the meantime... If I don't get other time constraints, I should be able to go through your "floorplan" step by step in the coming days, and I would be glad to revert to you with my findings.

In the meantime – thanks again. Cheers, Marcel

## What's HUP with the Weather?

Date :8/4/2005 10:58:50 AM Poster : James Siebert

Our Weather forecaster just predicted another "Heat Wave".

In this part of Oregon, a "Heat Wave" consists of two 90 degree F days in a row.

Since they predicted the last "Heat Wave" correctly, I'm slightly more inclined to take this latest prediction more seriously: (and dress accordingly; keep shades closed, etc)

The prediction looked something like this:

# MO TU WE TH FR H 79 85 91 95 96 L 56 60 65 68 71

Usually the further out the Prediction the less seriously I take it. (I usually ignore the Forecast more than a week out)

But since the Actual M, T, W High Temps, this week were quite close to their Forecasts, I am wear a Tee-Shirt today at work (Thur).

So what's this got to do with HUP? (Heisenburg Uncertainty Principle)

I've always visualized HUP to be a trade-off between the "Precision & Timeliness" of constantly changing data. (time series data)

If I wanted, I can always go back and lookup the Temps from last week with nearly 100% Accuracy, but the Timeliness of that info would be next to 0.

"Hindsight is always 20-20", but can this post-dated precision, help me decide what to wear tomorrow? (a timely decision)

Can I go Hiking this weekend? or will it be too Hot? Should I just stay indoors and work on Trading Systems?

These are some of my everyday HUP dilemmas.

On top of that there are some Weather Forecastors I have more "Confidence" in than others, even though they all look the same 3-4 Computer Models. Each weather person "selects" what they see as "significant" info from the models, based on what they personally have "learned" from experience. (ie their internal NNs shape their individual Forecasts)

Some Practical applications to explore:

If the long-term Trend says "expect a Hotter and Drier Summer than Normal", should I invest in more Tee-Shirt, and plan more trips to the Coast? (where it's cooler).

If an unexpected Cold Front brings in a string of Cloudy Days, should I still rely on tomorrow's forecast that originally predicted 90?

Should I put more weight on the Friday evening Forecast, than the prior Forecasts during the week, as I am planning my weekend activities?

Hint: the closer the prediction is to occurring, (timeliness) usually the more confidence I place in it. (accuracy)

What are some other "generalised observations" can we make about this simple HUP Weather analogy?

How can we extract "signal data" from the past reports, that might help us more precisely gauge future actions?

How is weekly, monthly, seasonal summary statistics relevant to planning for next

week, next month, next year?

If I give you a prediction like this

# MO TU WE TH FR H 55 51 52 55 53 L 42 44 43 45 42

What can you tell me about the weather pattern?

"You can't know everything, but that shouldn't stop you from trying." ;)

later,

James Siebert

**Re: What's HUP with the Weather?**

Date :8/9/2005 6:10:52 AM Poster : Mark Simpson

A superb analogy.

Also, there's another point that applies to trading.

If it's say predicted to be (Canadian version eh :- ):

M - 20C T - 35C W - 36C

and you were looking for a warm day then would a prediction with Tuesday being 35C be more likely to be a warm day (say over 25C), than a prediction for Tuesday of 26C.

I.E. If your prediction mechanism is could, are more extreme predictions more accurate if you have a general direction you wish to go in?

Mark Simpson Bowfort Technologies Inc.



### **How Does the Optimize Work**

Date :8/10/2005 4:40:20 PM Poster : Maciej

Can anyone explain how the optimizer works? My problem can be summarized as follows: I setup a trading strategy based simply on entry signals. It gives good results. However I note that it would have been even better if some sort of stop were to be employed. So I add protective stops to see how to improve matters. What happens is that my entry signals start disappearing and the results are a significantly degraded. As my entry signals have been frozen, ie I do not allow any further optimization as I select just the values that have been optimized on the previous optimization I would have expected them to continue to trigger entries in exactly the same way and merely to have the stops optimised. This does not seem to occur - Can anyone explain?

### **Re: How Does the Optimize Work**

Date :8/16/2005 1:09:20 PM Poster : Maxwell Craven

Any time a stop changes, then you have a different situation with regard to possible re-entry. Ie, you have the ability to get in earlier if you get an entry signal. Am I wrong?

Max

### **Re: How Does the Optimize Work**

Date :8/16/2005 3:35:03 PM Poster : Maciej

The answer is yes and no. If the entry signals were adjustable then your assessment would be correct. However what I'm doing is a two step process whereby I optimize for entries with no stops. I then cast these entries in stone by not allowing any changes, ie range is zero range as from 1 to 1 and add stops with large ranges. I would have expected the optimizer to try to get the ideal stops. This does not seem to happen. Without NSDT, this is the way I work, I get some interesting entry signals and try to improve matters with some money management techniques such as stops.

### **Re: How Does the Optimize Work**

Date :8/17/2005 8:58:53 AM Poster : Maxwell Craven

Do you have any kind of entry and exit rules? Even if you freeze the optimizer, it seems to me that a stop gives the entry rules a chance to execute at an earlier bar than would have been possible without the stop. If any one entry rule has a chance to execute earlier because of the stop, it seems to me the entire sequence could be thrown off. You should be able to compare sequences and see if this is the case.

### **Re: How Does the Optimize Work**

Date :8/18/2005 4:18:28 PM Poster : Ward.net Webmaster

See if your problem is because you don't have the "Long/Short entries exit existing short/long position" checked. When you have only entries, the entries act as exit signals. But when you have entries and stops, then the stops are the only exit signals unless that option is checked.

### **Re: How Does the Optimize Work**

Date :10/14/2005 2:50:16 AM Poster : vvv999vvv

Hi, Maciej

I experienced the same problem, only way you can achieve good results is simply only SAR entry conditions.

After you optimize your strategy, the range of optimization has changed, if you want to re-optimize it by adding more conditions, change the range of optimization again before you start training, cos the last result's range may limited your optimization.

Another way you can try is add the trailing stop and exit conditions but no train, ie, press cancell after you add the conditions are added.

### **Pre-processing Data Series: Smoothing**

Date :8/11/2005 12:17:15 PM Poster : James Siebert

Now for Something fun and practical:

For those of you looking for a easy way to "smooth" your data series with minimal lag Ehlers implies a way to do this is:

Smoothed Indicator =  $(P0 + 2*P1 + 2*P2 + P3) /6$

where  $P2 = \text{Lag}(\text{Price},2)$  etc.

He says this Smoothed Indicator will have only a lag of 1.5 Days

[pg 111 Ehlers, Cybernetic Analysis]

Smoothing attempts to "remove" the noise from the data series, leaving you with the "just the Signal" that is "hidden" in the series.

(I believe this is an example of a FIR Filter that Mark Simpson referred to earlier.)

I'm a big fan of pre-processing your data. (the less noise to have, the more accurate NN & TS Triggers will be. :)

Pre-processing can include detrending, filtering, normalizing, rescaling, and of course Z-Scores, which I feel is one of the easier ways to normalize, assuming your data follows "random walk" behavior.

(thus the Hurst digression, is this assumption valid?)

Another quick and easy way to Normalize your data that I've read about recently is called the "Decimalize" method:

NormDecimal =  $\text{Price} / 1000$

This has the result of "transforming" your Price series into an Oscillator, moving between 0.0 & 1.0

Any other Normalization Favorites out there?

I would like to hear about them, we can exchange recipes.

see ya

James S

### **Re: Pre-processing Data Series: Smoothing**

James,

That's a good subject to briefly "touch and go", thanks for initiating.

My view is that there are hundreds of smoothers / filters. The choice depends on: a) What compromise am I willing to take (signal clarity vs lag)? b) For what objective do I need it? c) Simple personal preference?

But one thing to consider first is whether you want to smooth Close only, or whether you wish to include OHL, which may also contain important pieces of "information". For a quick and dirty trial I normally use Close, but I like to add OHL (OHLC/4) in the fine-tuning phase. (See also

[http://www.ward.net/cgi-bin/Forum/Forum\\_Article.asp?a=2507](http://www.ward.net/cgi-bin/Forum/Forum_Article.asp?a=2507)).

The most important aspect is however that you can't have both at the same time, signal clarity and accuracy (no lag). For reasons we discussed in earlier threads ("What needs to be achieved to build a profitable Neural Net?"), I personally tend not to sacrifice accuracy. A lag of >1 bar is a killer, especially when this signal is then used as input to an indicator, which in turn adds another few bars. If the signal is used standalone (e.g. crossovers), I may however prefer to further reduce noise and accept a higher lag.

Once we have understood the tradeoff between signal clarity and lag and we know for what purpose we need to filter, it's only a matter of personal preference and resources at disposal. Without offending anybody, I'm a little fan of Jurik's products. To quickly smoothen a signal, I'd just average it with a JMA. But again, there are many other alternatives that are comparable.

One interesting option I've stepped into lately is the use of Wavelets as filters. Try `Sub(Close;WaveletFilterHaar(Close;1;100))` or `Sub(Close;WaveletFilterHaar(Close;2;100))`. The first is still "choppy", but introduces a lag of only 0-1 bars. The second is smoother and the lag is 0-2 bars. If you average both, you may like the output pretty much – it's as good as many expensive indicators...

This is only a little positive side finding while digging into this fascinating chapter. I'm still in an experimental mode wrt Wavelets and I've still lots of material to read on the subject, but I'd appreciate if we could add this topic to the "to-do" list...

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**Re: Pre-processing Data Series: Smoothing**

Date :8/14/2005 1:11:09 PM Poster : James Siebert

Marcel

Thanks for the WaveletFilterHaar ideas. I just tried them out, they are very effective smoothers, with minimal lag. Cool idea.

Thanks for the references on previous threads; I had skimmed through these before, and I will review them again, so I can get in sync with the previous goals and plan of the group.

Sorry if my posts have gone a little off track. I've only been trying expand on & illustrate ideas being discussed. I realize Math (& Stats) are not everyone's favorite subjects. But it kind of goes with the Neural Net territory. Most "Killer" systems will have a key Math principle(s) at their core.

Math can (sometimes) be fun.

thanks again for your comments

James Siebert

**Re: Pre-processing Data Series: Smoothing**

Date :8/16/2005 8:34:37 AM Poster : Marcel

Again, absolutely no problem with the discussion on Z-Score and Hurst, please continue to do so – It's my problem if I can't contribute... I'm currently testing a model with Z-Scores and although I'm reasonably happy with the signals in a Cycle-Mode, all advantages get wiped off with mistrades (contrarian position taken too early) in the Trend-Phases.

I agree that Math is fun – no question!!

Regards, Marcel

**Re: Pre-processing Data Series: Smoothing**

Date :8/16/2005 9:46:35 AM Poster : Alan RHodes

You may wish to try filtering trades based on the value of a trending indicator, such as VHF.

**Re: Pre-processing Data Series: Smoothing**

Date :8/15/2005 9:11:44 PM Poster : Alan Rhodes I would appreciate you posting any good articles

That's a good subject to briefly "touch and go", thanks for initiating.

**Re: Pre-processing Data Series: Smoothing**

James,

There's tons of very good material on the Web, simply Google with "Wavelets", the best are on the first 3 pages. Based on what's available, I don't think you need to purchase any books. On my side, I'm considering implementing one of the free codes as NST DLL...

Regards, Marcel

**Re: Pre-processing Data Series: Smoothing**

Date :8/16/2005 2:36:19 PM Poster : James Siebert

Alan

here's the link to more of the better sites I've seen on wavelets

<http://users.rowan.edu/~polikar/WAVELETS/WTtutorial.html>

Can't say that I understand all the math that's listed here,

But the conceptual overview (& the impressive 3-D Charts) helped me to understand how wavelets attempt to preserve "some of" both "precision and timeliness" of information contained in the data signal, concurrently.

Wavelets appear to be a compromise of information, but may be one of the better "solutions" out there for "getting around" that brick wall of Heisenberg.  
(the trick here seems to be knowing "where to look" in the Wavelet's 3 dimensions, and at what Resolution of details, to dial in the Wavelet Microscope)

Many thanks to the professor who posted the site.

hope you find it helpful, as well.

cheers

James Siebert

### **Re: Pre-processing Data Series: Smoothing**

Date :9/20/2005 4:16:24 AM Poster : vvv999vvv

For a better smoothing, a 3 pole super smoother is much better as described by the same book

On 8/11/2005 12:17:15 PM James Siebert wrote: Now for Something fun and practical:

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NormDecimal = Price / 1000

This has the result of "transforming" your Price series into an Oscillator, moving between 0.0 & 1.0

Any other Normalization Favorites out there?

I would like to hear about them, we can exchange recipes.

see ya

James S

### **Teach a NN to learn RSI or any other indicator**

Date :8/13/2005 2:29:36 PM Poster : Marcel

Well, I will take the 3rd off the list to start. So, let's learn RSI(5), and let me describe how I approached this step by step... To begin with, I took the default wizard parameters, changed the Output to predict "RSI(Close;5)" and the training objective to "Maximize Correlation", fed the NN with time-delayed changes in Close (change of today, yesterday, day before yesterday etc.) and let it learn. No surprise (can't be that easy right?), correlation close to zero! I told myself "the guy must have a hard time to translate changes into a bound indicator (0-100) like RSI", so started to add to the input little pieces of the RSI formula, like segregating advancing from declining changes, averaging them out, perform the ratio etc. I tried really many things, but never got a better correlation than 0.1! After a few hours I had enough – I decided to see what happens if I would feed RSI(5) straight away, anyhow I wasn't that far anymore... Correlation = 0.124. That's when I realized that I was not only teaching the NN to learn RSI, but also to predict it – Mission impossible! Set the "number of days to predict in future" to zero, return to the initial time-delayed changes in Close for the input, and voila, correlation >0.9! It depends a bit on the underlying data, but current change + 5 delayed changes provides a nice Corr(r) of 0.92, more than enough for me. But the nice thing is that you can train this same NN to learn – with the same input – other indicators. Most of them compute with a correlation >0.9 (1+5 inputs), some are a bit harder to learn, but adding a few more delayed inputs usually fixes the issue. This includes the indicators found under:

- . Price Momentum (good results)
- . Change (obviously with perfect results)
- . Advanced Change (average results – other input could help)
- . And even other more exotic ones

For other category of indicators you have to feed the NN with current + lagged Close prices, instead of changes. This is more appropriate for all categories of "Averages" and those found under "Time Series". Simplified to the extreme you can say: "For those indicators that you would usually plot in the price section of your TA chart, use the current + lagged PRICE inputs. For those that you would usually display beneath the price chart, use current + lagged CHANGES in price". Regards,

Marcel

### **Re: Teach a NN to learn RSI or any other indicator**

Date :8/29/2005 9:05:03 PM Poster : Mark Simpson Hi Marcel,

That's correct. It's quite incredible when you think about it. You only need the input to an indicator and it's output, and you don't need to know anything about how the indicator works. It also demonstrates that as long as the relationship is there, the neural network can learn it extremely effectively.

Mark Simpson Bowfort Technologies Inc.

### **Re: Teach a NN to learn RSI or any other indicator**

Date :1/6/2006 11:43:40 PM Poster : John Takacs Marcel and Mark Simpson: Marcel, thank you very much for bringing this up. It certainly adds a new dimension to the product. To both Marcel and Mark: Other than having it learn any indicator (the



obvious benefit), what else can this do? What I mean is, after you have trained it to learn, for example RSI, of what benefit is it to use your new RSI indicator, when your new RSI indicator is simply the old RSI indicator?

**Re: Teach a NN to learn RSI or any other indicator**

Date :1/9/2006 5:59:07 PM Poster : Mark Simpson

John It's not intended to use instead of RSI, or trade with, it's an exercise in how NN's learn. Think of it as a test bed. By testing with something that is known, you can experiment to find out what works.

I.E. If you can emulate RSI with a Neural Net, then you can learn what a Neural Net needs to successfully learn.

Neural nets are very effective at learning things that can be predicted, and very poor at learning inputs with heavy noise or no or little meaning.

Essentially the way I look at it is, instead of just plugging things into a Neural Network and seeing what works, start from the other way around. Start with something that works, model it, learn why it works, and then you know what you need to find to make a good model. I.E. A more targeted approach.

However that said, there is one thing that the test bed can be applied to, if you ever have a black box indicator, then just provide inputs and the black box output to the NN similar to how you setup RSI, and it will learn it fine. (provided it's a conventional indicator).

Regards Mark Simpson Bowfort Technologies Inc.

**Re: Teach a NN to learn RSI or any other indicator**

Date :1/12/2006 8:26:13 PM Poster : Sunny Mark, That was brilliant! I am presuming that you chose no optimization for this prediction.

Do you do walk forwards for this prediction of the RSI(5) using close + lags of close as inputs?

Do you use all available neurons or only some? Now you have a trained prediction with a high correlation. (Does it make any difference if you choose instead of maximizing correlation to choose to minimize the average error?)

Do you enter the output of this highly correlated prediction into another prediction as an input?

1st prediction uses close + lags of close as inputs and as the predicted output the RSI(5). 2nd prediction uses the out of sample of the 1st prediction as input, and as the predicted output.....? Do you again try as the predicted output the same RSI(5) or something different?

In this case the number of days to predict in the future is something (1 or more days), and there are some walk forwards.... Regards,

Sunny

**Re: Teach a NN to learn RSI or any other indicator**

Date :1/16/2006 1:11:05 PM Poster : Mark Simpson

> I am presuming that you chose no optimization for this prediction. Correct.

>Do you do walk forwards for this prediction of the RSI(5) using close + lags of close as inputs? Yes

>Do you use all available neurons or only some?

I use the default, although extra neurons won't make much difference anyway, because the neural network doesn't have an issue learning the relationship.

>Now you have a trained prediction with a high correlation. (>Does it make any difference if you choose instead of maximizing correlation to choose > to minimize the average error?)

I haven't tried it, but essentially it shouldn't make much difference.

The key is that you have zero noise because your training data (RSI) is an exact calculation on the input (close and lags of close). When a neural network has everything it needs, essentially tweaking the controls won't make too much change. When the neural network doesn't have everything it needs, tweaking the controls can make a huge difference, but you can't necessarily trust the results either.

>Do you enter the output of this highly correlated prediction into another prediction > as an input?

You could do. But remember, you can't trade this. It's an exercise. All you've done is built a NN to learn RSI, and just using the RSI indicator (without an NN) will produce a slightly superior result.

Regards Mark Simpson Bowfort Technologies Inc.

### **Re: Teach a NN to learn RSI or any other indicator**

Date :1/13/2006 10:23:22 AM Poster : Steve Ward

Mark said: "Neural nets are very effective at learning things that can be predicted, and very poor at learning inputs with heavy noise or no or little meaning."

I'm not as concerned about noise as Mark is, because nets have actually long been used for signal noise removal. It may depend on what "heavy" means, but I'm more concerned about non-repeating patterns, which is certainly one case of "little or no meaning". I have two charts in the attachment to illustrate.

[Click here to download the illustration charts](#)

First I built a text file with repeating numbers  $x$ , then made a sine wave from them  $\sin(x)$ .  $\sin(x)$  goes from -1 to 1, so I added  $\pm 0.3$  to the sine wave as noise. I loaded them into a chart which is "repeat patterns with noise (data saved).cht". Given the repeating pattern as the single input, I predicted the noisy sine wave, including 1 year out-of-sample evaluation. As you can see, the prediction cleaned up all the noise and produced a pretty clean sine wave. You can repeat the experiment with even bigger noise if you want to, or try more hidden neurons for tighter fitting.

Next I made a non-repeating series of incrementing numbers (I hate to call that a pattern) and made a sine wave from them. They are in the chart "non-repeating patterns (data saved).cht". I inserted another prediction where I tried to predict even the non-noisy sine wave using the non-repeating numbers as the input. As you can see, the net failed miserably - it had no idea what the pattern was. Why? Because if patterns don't repeat, the net has no way of extrapolating the non-linear curve. The output repeated, but the input didn't.

Of course if you do some preprocessing on the non-repeating numbers, like dividing them by 6.28318, and making the remainder of that division the one input, then the net works because the patterns now repeat. (The math geeks among you will understand what I did.)

The moral of the story - neural nets only work where there are historical patterns of input/output pairs that repeat over time, even if they are noisy.

### **One question on normalization**

Date :8/14/2005 11:18:55 PM Poster : Alan Rhodes

I have been reading lots of great posts since clearing my head from dust from working on forest fires (action too slow to get much smoke). Though I could use a little slowing down overall in the rate of new subjects, I do have one question.

Several of the posts imply that predictions should be totally normalized (I define that as zero based). I do not understand why that is good.

It seems to me that would work well during a cycle mode, but during a trending mode I would expect the prediction to drift around zero in whatever method you use to normalize the data.

Earlier one person suggested using the culmination of percent change. I am going to work on developing a variation of that. I tried that once and got the same problem I had with other non-normalized predictions. The problem with many non-normalized predictions is that the best predictors are the current values of what you are predicting. In other words, if the current value of what you are predicting goes up, the neural network raises the value of prediction. If the current value goes down, the prediction goes down.

Also earlier Mark implied that Z-Score based systems can fall apart during trending mode. This is probably related to the fact that such systems are by nature zero based.

## **Curve fitting. What it is, how to avoid it and how to use it to advantage**

Date :8/30/2005 2:24:54 PM Poster : Mark Simpson

This thread is about curve fitting. I also refer you to Steve Ward's tips on preventing over-optimization <http://www.ward.net/cgi-bin/viewtip.asp?ID=105> as a guideline for what you can do to avoid it.

So, lets start off with what a GA (Genetic Algorithm) is, to remove some of the mysticism behind the GA built into Neuroshell. Personally I believe that it's by understanding the principles of this that it can be better used to advantage. The GA is a very powerful tool if used correctly, if used incorrectly it can sink you.

You've probably come across the following problem, you build your system, keep optimizing various types of system until you find one that does well, then you trade it in realtime, and poof, that well performing system eats you alive. If you've done everything else correctly, i.e. tested on out samples and used walk forwards, then the chances are you've just incorrectly curve fitted without realizing it.

So what is curve fitting? If you imagine your trading system like this, you have inputs and you have an output (trading signals). You have a black box in the middle which translates between. Essentially the output is a function of the input. I.E.  $Output=f(Input1..Input N)$

The output is the curve, i.e. it's a varying function, and the idea is that we have to design the function so that it fits that curve.

So, lets translate this to the NST world. We use a bunch of indicators to go into our "function", and then see how well the function works (performance). However it doesn't do too well, so we use the optimization feature in NST (a GA) to alter the parameters to the indicators to make the function fit the curve better.

A Genetic Algorithm (GA) is just a tool to reduce the search space. For instance if you had 5 indicators with a total of 10 possible parameters, then to try every possible combination would take a long time. Trying every possibility is a brute force method and isn't practical unless your model is extremely simple.

A GA looks at the problem differently. If we wanted to find the highest peak in a range of mountains, then visiting every mountain takes too long, so a GA uses a targetted approach. I.E. You guess a local peak to begin with. It probably isn't the highest peak, so you guess again. Then using a chromosome/gene model borrowed from biology, where you have survival of the fittest, you match the good parameters of the mountains and keep going. Essentially you keep going, at every generation, the fittest members survive to keep going, until you can make no more "reasonable" improvement. I.E. Your solution evolves to find the best answer just like life on earth. What's happening is your taking spot readings over the range and homing in on the highest mountain.

A GA has a fitness function (in this case the height of the mountain), in the case of trading, it's your goal. The GA is a tool to help us fit the curve. A brute force method can be better than a GA, but if a GA doesn't reach the correct answer, it will likely reach one that's close. I.E. In the trade off between brute force and a GA, GA is really only the practical way to go, although brute force may be occasionally a little more superior in result.

So lets try some examples of incorrectly curve fitting with a few examples.

**CURVE FITTING WITH TOO LITTLE DATA:**

So we toss some coins. Coins can be heads or tails and our goal is to build a perfect coin toss predictor. We toss 3 times, and get heads each time. Therefore we optimize our solution, and build a perfect coin tosser that always generates heads as the answer. So what's wrong?

Well, our curve is heads/tails, but we took such a small sample (of size 3), that we didn't see the real picture. I.E. We tried to fit a curve where we couldn't see the whole curve. In trading, this is a classic mistake that is commonly made. We genetically optimize with not enough data. Remember from before that to be reasonably confident that we haven't incorrectly curve fitted the data, we need 30 trades per degree of freedom (DOF) for every variable in the model.

This shows up as, building a model that optimizes well, then trades poorly in real time. If you tested with adequate data, you'd have found out that it really was poor in the first place.

### CURVE FITTING BY SELECTION: STOCK PICKING

We can also incorrectly curve fit by picking results, without even using a GA.

For instance, if you were to trade say 10 stocks randomly for a period of time, you'd likely make money on some and lose money on others. Just like tossing a coin would produce heads and tails.

So you have your perfect model and you want to trade, but it works on some stocks not others, so you plug in 100 stocks to find out which ones do well and which ones do poorly, and keep the good ones. Well you've just incorrectly curve fitted by another means. (or another way of looking at it is rendered your out of sample to be in sample). This is because out of any population (the 100), if you pick and choose your sample (the good ones), then your sample is no longer truly representative of your population.

### CURVE FITTING BY SELECTION: INDICATORS

So, instead of picking the best stocks to use in your model, you pick the best indicators, i.e. just keep plugging at it until you find indicators that work.

Again, just another form of incorrect curve fitting for the same reason as the last.

### CURVE FITTING BY SELECTION: PICKING THE BEST RESULTS

So you keep trying models until you find the best one. Again, just incorrectly curve fitting.

As you can see, this is a huge problem, there are so many ways to incorrectly curve fit. Anywhere where you pick and choose, or try different things open you up to curve fitting.

One solution might be to create another out of sample testing to get around the problem. But again, if you pick and choose between those out of samples, you're opening yourself up to the same problem again.

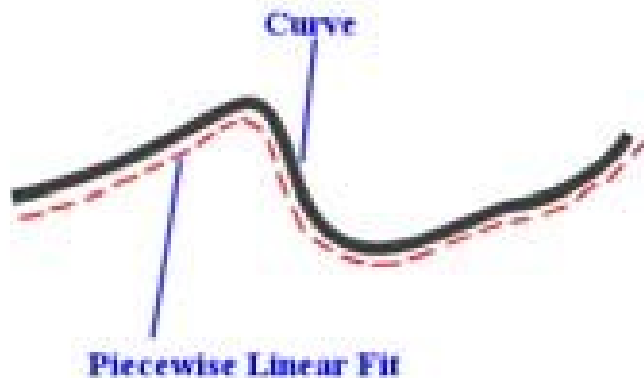
So, incorrectly curve fitting is not 100% avoidable, but needs to be realized and managed. Personally I follow this method to avoid it as much as possible:

1. Never try things out in a model in an untargetted approach, and this is where these threads about design models come into the picture. Start off with a goal, and design a model to fit that goal, don't just guess at methods or indicators that will work, start

off with solid design from the ground up.

2. Use a GA to improve good models, not to make bad models work.
3. If using a GA, use it at the end of the process, i.e. as a final improvement to an already good model.
4. Use sufficient data to test with.
5. Always keep additional out of samples to test on. A good out of sample is always paper trading.
6. Never pick and choose results, stocks or anything else. (At least not without being aware of it and knowing the effect).
7. Keep degrees of freedom low. I.E. The smaller the DOF, the less data you need to validate which makes everything a lot simpler to test. USING CURVE FITTING TO ADVANTAGE:

There is another way to approach curve fitting and make it work to your advantage. At first it seems like a crazy approach, but there are good reasons why it works. That is to keep DOF small and optimize frequently. The reason for this is because of the curve fitting. Normally we wish to fit that curve perfectly, however, any curve can be approximated by a series of small lines. This is called a Piecewise Linear Approach. Linear = Line, Piecewise means small pieces.



I.E. If you keep Degrees Of Freedom (DOF) low so that your fit can be validated in minimal time, i.e. you're creating a small line, then it can fit (approximately) the curve of your function for a small period of time. You then reoptimize frequently to get additional small segments of lines.

Mark Simpson Bowfort Technologies Inc.

**Re: Curve fitting. What it is, how to avoid it and how to use it to advantage**

Date :8/31/2005 6:23:43 PM Poster : James Siebert

Mark

Glad to see your in-depth explanation on "curve fitting"

Thanks a lot. It helps.

I never knew there were so many ways to run into this problem.

I especially like your description of the "finding the highest peak in a range of mountains"

-attached are a couple of xls I put together, to illustrate some Mountain Terrains in the SMA parameter space -[SMA Lanscapes.zip](#)

I have always visualized that NN train, by "rolling a marble around" in a Parameter Solution Space, trying to find the Lowest spot, in that terrain.

The Lowest spot represents the "Minimum Prediction Error", for the given combination of Input Parameters, intersecting at that point.

Sometimes "the marble gets stuck" in a local valley, before it finds the actual bottom (a lower valley)

Some questions

1) when NN get stuck at such a local minimums, does it help to:

- a) increase training time
- b) increase number neurons
- c) increase walk-forwards episodes
- d) increase data inputs
- e) change training objective
- f) reduce net inputs

2) how often should NN be re-trained, when the Solution Space Terrain may change over time? (for example, a stock SMA may change Cycles from 30 day to 50 days, in a matter of weeks)

3) Is curve-fitting, getting stuck in a local Minimum, or stuck in a "stale or obsolete" Prediction Terrain? Or something else entirely?

4) Does the Piece-Wise Curve fitting you describe have anything to with using/retraining with very short Time Horizons? (fitting short time window Nets to the "ideal curve", what ever "the ideal" is)

Thanks in advance, for any more light you can shed on this subject

James Siebert

**Re: Curve fitting. What it is, how to avoid it and how to use it to advantage**

Date :9/1/2005 11:41:00 AM Poster : Mark Simpson

>I especially like your description >of the "finding the highest peak in a range of mountains" That one I've seen in a few places in descriptions of GA, so it's not my description as such.

>-attached are a couple of xls I put together, >to illustrate some Mountain Terrains >in the SMA parameter space -Those are good charts. You have a knack of visualizing these things well.

>Sometimes "the marble gets stuck" in a local valley, >before it finds the actual bottom (a lower valley)



>Some questions

>1) when NN get stuck at such a local minimums, >does it help to:

>a) increase training time

I'd guess a yes on this one (depending on the neural net architecture being used).

>b) increase number neurons

I'd say yes on this one. (though not guaranteed in every case).

>c) increase walk-forwards episodes

If you train on different data, you could get different results, so I'd say yes.

>d) increase data inputs

Again, different data, so I'd say yes.

>e) change training objective

Different data, so different surface for the ball to move around on so yes.

>f) reduce net inputs

Different data, so again yes.

Those are my gut reactions. However, the key point is change the data, and you'll likely either end up in a different local minimum, or the global minimum.

Bear in mind that a local minimum may not be bad if global minimum - local minimum approaches zero.

The other thing I'd like to add is that the settling in a local minimum can be highly dependant on these 2 things:

1. The type of Neural network you're using. Some handle learning better than others.
2. The shape of the surface. I.E. A surface that is busy is more likely to have local minima, than a surface which is flat or curved.

>2) how often should NN be re-trained, >when the Solution Space Terrain may change over time? >(for example, a stock SMA may change Cycles >from 30 day to 50 days, in a matter of weeks)

1. My initial reaction on this would be to wait for the discussion on Time Normalization, and the answer will become clearer, however in the meantime:

In theory if you had everything correct, then why would a NN need to be retrained? So that begs the question, what's changing to require the need to retrain? I.E. Why is the solution space terrain changing over time? :-)

NN's we've figured out before are simple function imitators. So if the function we're using is varying over time, either we should fix that OR supply some indicator (an adaptor) which measures the adaptation in the function to the NN OR piecewise linear fit it.

The only problem with piecewise linear fitting an NN using backprop, is the amount of time needed to adequately train and test(walkforwards) an NN, which means that the pieces are generally too long. So backprop generally doesn't work too well for piecewise linear fitting unless the function varies extremely slowly over time. So generally piecewise linear fitting is best done with the GA instead of an NN.

>3) Is curve-fitting, getting stuck in a local Minimum, >or stuck in a "stale or obsolete" Prediction Terrain? >Or something else entirely? Curve fitting means different things to different people. My interpretation is that if you've reached a local minima that is acceptable, then you've curve fitted your function (which is good). If your local minima is not acceptable, then you've incorrectly curve fitted (or poorly curve fitted).

So if you took an NN, the data you're training against, or your out of sample is the function you're trying to approximate, and your NN output is what you're trying to approximate it with. So say you were training on 6 day percent change in close, then the actual 6 day percent change in close would be the function you're approximating, and the NN's prediction of a 6 day percent change would be your approximation. The accuracy of your prediction would be how well you curve fitted. If you did something incorrect in your thinking, e.g. didn't use enough training data and got a good approximation, then you've curve fitted well (got a good result), but you've incorrectly curve fitted because of the method used.

That's for an NN, for a trading strategy, then it's all about trades. Your optimization objective is your actual, and your strategy results are your approximation.

>4) Does the Piece-Wise Curve fitting you describe >have anything to with using/retraining >with very short Time Horizons? >(fitting short time window Nets to the "ideal curve", >what ever "the ideal" is) Correct. It's the same thing. The piece-wise curve fitting is the reason why it works. The example I provided used a GA, but the principle can be applied to NN's and other techniques.

Mark Simpson Bowfort Technologies Inc.

**Re: Curve fitting. What it is, how to avoid it and how to use it to advantage**

Date :9/2/2005 7:52:20 PM Poster : James Siebert

Mark

Thanks for your detailed replies to my questions, about Solutions Terrains and Local Minimums.

Your answers made me realize that curve-fitting is not necessarily a "bad thing". A well-trained NN will in effect be a "substitute curve" for the actual input factors and their complex interactions.

The closer the "substitute" (NN) represents the "actual" behavior, the more predictive power it will have.

Optimization allows the substitute terrain to "form-fit" to the actual terrain.

So when does "over-optimization" occur, with negative effect?

Until recently I thought this had something to do the NN "memorizing the data", as opposed to "responding to it" in a natural, inherit way

Now it seems "the closer the curve the better" should be the rule of thumb (?) (assuming inputs, actually models existing dependant relationships)

=====

Regarding your Comments:

>>>>>>> >The other thing I'd like to add is that the settling in a local minimum can be highly >dependant on these 2 things:

>1. The type of Neural network you're using. Some handle learning better than others. >>>>>>>

What are some different Types? TDNN, Crossovers, Market Mode Filtering, Correlated Inputs, Signal Components, etc?

Or by "Type" are you referring to Objectives, Neurons, # of Inputs, # of Walk-forwards, level of Optimization?

Comment 2:

>>>>>>>> >>2) how often should NN be re-trained, >>when the Solution Space Terrain may change over time? >>(for example, a stock SMA may change Cycles >>from 30 day to 50 days, in a matter of weeks)

>In theory if you had everything correct, then why would a NN need to be retrained?

>So that begs the question, what's changing to require the need to retrain? I.E.

>Why is the solution space terrain changing over time? :-)

>NN's we've figured out before are simple function imitators. So if the function we're >using is varying over time, either we should fix that OR supply some indicator (an adaptor) >which measures the adaptation in the function to the NN OR piecewise linear fit it. >>>>>>>>

Don't Market Behaviours change over-time? one model can't anticipate those changes, can it?

(ex. Sector Rotation, or Spectualtion Bubbles bursting, etc)

Another way of putting this, How often should a NN be retrained, and for what reasons?

Note: I'm looking forward to furthur discussions on Time Normalization, and piece-wise fitting, and adaptive indicators.

Thanks again

James Siebert

### **Re: Curve fitting. What it is, how to avoid it and how to use it to advantage**

Date :9/3/2005 12:46:11 PM Poster : Mark Simpson

Hi James

>Your answers made me realize that >curve-fitting is not necessarily a "bad thing".

>A well-trained NN will in effect >be a "substitute curve" for the actual input factors >and their complex interactions.

A piecewise linear approach works, however DOF must be small, otherwise the pieces are too large to fit. I.E. you can't piecewise linear fit a sine wave with a line that is half the cycle length. However you could fit it with a line that is 1/100 of the cycle in length.

So in reality, most models have too much DOF to be viable for a piecewise linear fit approach. You really want to be aiming for 1 DOF to be viable, i.e. "30 trades" to test in most cases. Because each line piece has to be statistically valid as well as

small to be assured that the model works.

>Regarding your Comments:

>>>>>>> >The other thing I'd like to add is that the settling in a local minimum can be highly >dependant on these 2 things:

>1. The type of Neural network you're using. Some handle learning better than others. >>>>>>>

>What are some different Types? >TDNN, Crossovers, Market Mode Filtering, >Correlated Inputs, Signal Components, etc?

>Or by "Type" are you referring to >Objectives, Neurons, # of Inputs, ># of Walk-forwards, level of Optimization?

I mean architecture of neural nets/learning methods. I.E. Back propogation, LVQ, PNN, GNN, Kohonen etc. They have different learning methods, so some are better at local minima type issues than others for a particular solution.

>Don't Market Behaviours change over-time? >one model can't anticipate those changes, can it? >(ex. Sector Rotation, or Spectualtion Bubbles bursting, etc)

>Another way of putting this, >How often should a NN be retrained, >and for what reasons?

Yes, market behaviours do change over time, but this change is a variable, and if you can quantify it and measure it, then you are essentially either giving the neural net the ability to account for this via an extra input, or you fix the data for this before providing it to the NN. in which case the NN need not change. Remember that a NN can only reproduce what it has learnt before. If you don't account for this, then you're left with either trading things that don't change their behaviour, or using a piecewise linear approach.

In my opinion, a lot of the reasoning for people saying, the "market changes over time", is because of people assuming that time is linear. They are too tied to a clock concept. The market has a "rate", which will become apparent when we discuss time normalization when the curve fitting/piecewise linear discussion is wrapped up.

I really wanted to save this to the time normalization discussion, but as a taster, consider the following. Regarding the bubble, if the bubble was stretched out and the surrounding area compressed, is it still a bubble? What happens to indicators during bubbles? I.E. Should you be using indicators with shorter periods, or longer periods during a bubble? Are things the same pre, bubble and post? How could they be made the same to remove the bubble? We'll answer these questions.

Mark Simpson Bowfort Technologies Inc.

**Re: Curve fitting. What it is, how to avoid it and how to use it to advantage**

Date :10/21/2005 9:33:41 AM Poster : Dan

Mark,

I really appreciate your helpful tip regarding 30 trades per DOF, and read another of your articles that suggests: "Calculate the number of Degrees of Freedom in your model (DOF) - aka variables, and validate the model with 30 trades per degree of freedom."

I wonder if you could clarify how to calculate DOF. Does one simply count each indicator in a system as one variable, or, in the case of indicators that have more than one optimizable parameter does one count every optimizable parameter in every indicator as a variable?

Thanks again for the helpful articles,

Dan

**Re: Curve fitting. What it is, how to avoid it and how to use it to advantage**

Date :10/22/2005 4:38:30 PM Poster : Mark Simpson

Hi Dan,

DOF means a lot of different things to different people, however the way I approach it is as follows.

To me a degree of freedom is an item that can change in a model. This could be:

1. A parameter to an indicator
2. Choice of indicator
3. Choice of security

All this is pretty vague, so hopefully the following examples will clarify it:

Model Inputs: RSI(x) on 1 security where x is optimized. Answer: 1 DOF as x is a variable parameter i.e. it can change.

Model Inputs: RSI(5) on 1 security. Answer: 1 DOF (as you need to validate the model on something).

Model Inputs: MACD(close,12,26) on 1 security Answer: 1 DOF (as you need to validate the model on something).

Model Inputs: MACD(close,x,y) on 1 security where x/y are optimized. Answer: 2 DOF (x and y)

Model Inputs: MACD( RSI (z), x, y) on 1 security where z/x/y are optimized. Answer: 3 DOF (x, y and z)

Model Inputs: MACD (RSI (z), x, y) where z/x/y are optimized, and then we try different stocks against it to find which ones perform best. Answer: 4 DOF (x,y,z and stock selection)

Model Inputs: Indicator(x) where x is optimized, and we try many different indicators to find one that works on 1 security. Answer: 2 DOF (x and Indicator selection)

Model Inputs: MACD(close,5,20) where we just guessed 5,20 as being the parameters on 1 security. Answer: 1 DOF (as you need to validate the model on something)

Model Inputs: MACD(close,5,20) however, we tried many different values for 5 and 20 until we found the ones that worked on 1 security. Answer: 2 DOF (because you were manually changing both the 5 and 20).

So if you let the optimizer choose a value, 1 DOF gets added. If you manually choose a value through experimentation, 1 DOF gets added.

**Re: Curve fitting. What it is, how to avoid it and how to use it to advantage**

Date :10/24/2005 8:17:47 AM Poster : Dan

Thanks Mark! This is very helpful.

Dan

**Re: Curve fitting. What it is, how to avoid it and how to use it to advantage**

Date :11/10/2005 9:21:15 AM Poster : Dan

Mark,

I've been working on some models using the 30 trades per DOF guideline, and am beginning to see some possibilities emerge. However, I am hitting a particular snag consistently, and I wonder if you (or the Ward folks) have any insight/suggestions. It seems like the number of trades I need to validate a right edge of the chart, where I need to start trading.

For example, let's take a simple 2 indicator crossover system (I am using some add-on indicators). I optimize 2 indicators for longs, and 2 indicators for shorts. (I like for values for longs and shorts to be different b/c the market accelerates downward more quickly than upward.) This equals 4 variables, therefore the model would need 120 trades to validate. In addition, I like to use an exit indicator, which sometimes I will optimize as linked for longs/shorts. This brings the minimum no. of trades up to 150-180 depending on whether the exit variables for long/shorts are linked or not.

I find that I need to go about 5 yrs. back in order for the model to accumulate that many trades. No matter what objective I use to optimize the equity curve (max return \* equity curve corr. is my favorite), the GA seems to produce results that are great in the first 3 yrs or so, but, again, mostly flat for the last year or so.

Any suggestions/ideas? Is there any way to ask the GA to steepen the curve toward the end of the model, or valid shortcuts around the 30 trades per DOF guideline?

Many thanks for your kind attention-

Dan Melton

**Re: Curve fitting. What it is, how to avoid it and how to use it to advantage**

Date :11/14/2005 12:13:25 PM Poster : Mark Simpson

Hi Dan,

It's difficult to provide exact reasons without seeing the model, however these are some points:

1. You mention that the equity curve is good at the beginning and flat at the end. That suggests that you're running the GA on a certain period of time, and your "out of sample" is recent (presumably the flat part). A GA will generally do a good job of curve fitting because that's what it's designed to do. So the "out of sample" (provided you haven't curve fitted by manually curve fitting, i.e. stock selection etc.) becomes the measurement of how well your model is working.

I.E. If you've validated with enough trades for the DOF and the out of sample is poor, then the model more than likely doesn't work, and the model needs refining or replacing.

The GA always tries to fit over the data you provide it, i.e. if you use the GA over 8 years, then the results should be fairly consistent during that time (provided the market has the opportunity to make money). Which is why you need the out of sample to validate it.

2. Regarding DOF, you can't really cheat as such. However you can make better indicators that have fewer DOF. It's feasible to build an indicator (assuming the 2

indicators you are using are the same in the short and long), such that you have 2 indicators for long and short with a 3rd variable which essentially determines essentially becomes the adaption between short and long, that would give you 3 DOF and save 1 DOF, as currently you have duplication of information, essentially you're removing correlated information by removing that 1 DOF. If you can get DOF really low, i.e. 1 DOF (maybe 2), then you can get into piecewise linear approach of curve fitting (you still need to at least validate on an out of sample, until you're happy the model works).

3. Also watch out for lag. I get the impression (although you don't explicitly say), that you're using lagging indicators.

If possible, post your model to the forum, and we can take a further look at it.

Regards Mark Simpson Bowfort Technologies Inc.

### **Re: Curve fitting. What it is, how to avoid it and how to use it to advantage**

Date :11/15/2005 11:05:45 AM Poster : Dan Mark, I'm attaching an [example chart](#)--a simple out-of-the-box crossover system from the Cybernetic Indicator add-on using Adaptive RVI. From here I sometimes elaborate with alternative exits and/or stops (results roughly similar). I'd also like to combine this with another system that kicks in when

the market is trending as opposed to range-bound, but here is where I get into trouble in needing so many trades to account for the DOF for what is essentially two systems combined into one. In case you don't have those indicators on your machine, I'm attaching a picture also (at least you can see the equity curve).



Thanks for any other thoughts you might have!

Dan Melton

**Re: Curve fitting. What it is, how to avoid it and how to use it to advantage**

Date :11/20/2005 3:00:07 PM Poster : Mark Simpson

Hi Dan,

First of all, you're not using an out of sample test as such, because the optimization date range is the same as the paper trading date range. Though this isn't causing the flat spot, it doesn't provide validation of the model either. I.E. you're validating the performance of the model with exactly the same data you're curve fitting the model to work best with. In NST you can separate out the paper trading date range from the optimization range. However when you do that, you'll see the model doesn't perform too well anymore.

Regarding the flat spot. As Steve said, the market dynamics have changed. If you put a volatility indicator on that same chart, you'll see that around the beginning of 2003, volatility significantly dropped. The model worked well in a high volatility situation but not in a low volatility situation. Unfortunately, the DOF issue precludes you from producing a new model yet, i.e. you don't have enough recent data.

Assuming the model did successfully validate in paper trading at some point in time, then the only other way around the change in market this would be to normalize time, i.e. change the underlying data, this would produce volatility which was consistent and indicators which were "better behaved".

Mark Simpson Bowfort Technologies Inc.

**Re: Curve fitting. What it is, how to avoid it and how to use it to advantage**

Date :11/22/2005 12:39:52 PM Poster : Steve Eberbach

Hi Mark: It is for this reason (changing volatility) that I have always converted all my indicators into moving z-score plus standard deviation (two variables). That way I have the inputs I need to test if there is useful information in the changes of volatility of each input. Another benefit of z-score is that the numeric indicators are nicely normalized, making it easier for me to read all my charts, since then I can put several indicators of different colors on one chart without severe vertical axis scaling problems which arise when trying to draw comparative charts.

Since Steve has written normalization into the neural nets, maybe he could include an option to simply display the input indicators as normalized for the prediction wizard, wherever these are in the memory, whether it is plus-minus a range, or z-score, or something else.

Steve Eberbach

**Re: Curve fitting. What it is, how to avoid it and how to use it to advantage**

Date :11/25/2005 2:12:37 PM Poster : Sunny

Steve,

I was quite intrigued by your description of using "...moving z-score plus standard deviation (two variables)..." for changing volatility. I was wondering if it would be possible for you to post an example of how you accomplish this. I attempted several



ways of combining them; however, I have to admit that I failed miserably in my trials. I would include to your wish list (from Steve) the ability to see information pertinent to each prediction on a chart shown as a table. Sometimes it is handy to have a list of different types of information for each prediction.

For instance, I work with several predictions on a chart at once, and sometimes I make mistakes with regards to the setup of some of these predictions. A list showing the number of neurons used for predicting in each prediction, the objective function used (for instance, maximize winners minus losers), the minimum and maximum dates for training, what is being predicted, what inputs were included, etc.

It seems kind of irrelevant information, but when you make a mistake with several tens of predictions, it takes a while to find the prediction causing a problem. A list showing the information from different predictions would allow a quick glimpse to find if one of the predictions was not "lined up" with the others.

Best regards,

Sunny

#### **Re: Curve fitting. What it is, how to avoid it and how to use it to advantage**

Date :11/25/2005 4:49:15 PM Poster : Steve ward

The Prediction Wizard always uses z-score, as do the add-ons AT2 and NI. ANI, however, has no normalization across inputs, so only there is it really necessary to normalize across inputs. Normalization over time (detrending) is really where you need to be careful. Use indicators that are already normalized (like RSI, etc) or if using raw prices, then use change, percent change, spread from a moving average or index, etc.

#### **Re: Curve fitting. What it is, how to avoid it and how to use it to advantage**

Date :11/26/2005 6:41:50 PM Poster : Steve Eberbach

Sunny:

What I use is a spreadsheet called WaveWi\$e to convert my files to log-normalized format, and Z-scores for the log normalized version of the data. This I do because I use very long data sets for stocks which range over 50 years' time to find the cycles which have persisted the longest time first, or even more relevantly, the cycles and correlations which have "always" made a comeback even if they almost disappear for a while. When run through the nets, if the neural net's lookback window is different from the one I chose, there will be a doubly applied z-score normalization.

I append an abbreviation, such as "Z40" to, for example, DJICLOSE, to indicate the input dow jones industrials close, z-score of a 40 bar moving window. I also keep the standard deviation associated with that 40 bar window, which is otherwise discarded information when just normalizing by z-score. That standard deviation represents the average variance from the 40 bar moving average, the average amplitude of variance from that moving average. The z-score represents "how many" of these standard average variances (differences squared) the present bar's value is from the moving average at the present bar. If both the z-score and the associated 40 bar standard deviation are available to the neural net as choices for input, then the neural net can "decide" if the local (40 bar) variance has any modulating effect on the significance of the normalized input, the z-score.

So, in the case of Steve Ward's add-ons or the prediction wizard, you would add another input, "DJICLOSESD40" if your window length, the "look back length" was 40 bars, along with the existing input, "DJICLOSE" which was normalized with the lookback window size, 40 bars, to give your network information of local volatility from which that normalization was automatically derived by the network's normalizer. So besides normalization "across inputs" as Steve points out, you also have normalization "across time intervals".

Steve

**Re: Curve fitting. What it is, how to avoid it and how to use it to advantage**

Date :11/29/2005 7:36:29 AM Poster : Sunny

Steve,

Thank you for your thorough description.

I tried several different variation; however, there is something that I am doing wrong, and I would like to check with you on what I am doing:

Non-normalized

DJI-C

Lag(DJI-C, 40)

StdDev(ln(DJI-C) - lag(ln(DJI-C),1), 40)

StdDev(ln(DJI-C) -lag(ln(DJI-C),40), 40)

Normalized

ln(DJI-C) - lag(ln(DJI-C),1)

ln(DJI-C) - lag(ln(DJI-C),40)

StdNormalZScore(ln(DJI-C) -lag(ln(DJI-C),40),40)

StdNormalZScore(ln(DJI-C) - lag(ln(DJI-C),1), 40)

The normalized inputs are placed in a prediction.

I predicted the percentage change in the open. The number of trading days into the prediction from the next open were 4. I tried this both with optimization and without it. I tried 4-walkforwards of 3-months. I chose both long and short positions. I used the trading rules greater than or less than zero. The training objective was to maximize winners – losers. The maximum training set size was 5 years. The minimum training set size was 4 years. Maximum number of hidden neurons during training were 80

The results that I got were not very good so I am sure that I did not follow your ideas correctly, but I am not sure where I am messing this up.

Regards,

Sunny

**Re: Curve fitting. What it is, how to avoid it and how to use it to advantage**

Date :11/30/2005 7:36:07 PM Poster : Steve Eberbach

You specify: StdNormalZScore(ln(DJI-C) -lag(ln(DJI-C),1), 40) This does make sense to normalize the "log delta" over a 40 bar window using z-score. But you jumped to using a 40 bar lag, similarly normalized. I would prefer using all the lags

of:StndNormalZScore(ln(DJI-C) - lag(ln(DJI-C),1), 40)' Which is the Zscore and log delta normalized close. You should derive all your lags from this normalized change, as well as other interesting indicators, such as the Cumulation of this normalized log-delta z-score normalized price called close. Not just lag 40. Lag 40 may not be relevant as other lags. 40 is just the window span I used for standard deviation of log delta over two months, which I found useful for s&p index and stocks. Steve Steve

**Postscript-Re: Curve fitting. What it is, how to avoid it and how to use it to advantage**

Date :11/30/2005 7:59:03 PM Poster : Steve Eberbach

Also, I prefer  $100 * (\ln(\text{DJI-C}) - \ln(\text{lag}(\text{DJI-C}, 1)))$ , since it translates changes into a "reversible" percent change indicator. By that I mean if you accumulate these changes you restore the correct shape of the logarithmic price, on a percentage return basis, even if you go back and forth between changes and integrated (cumulative) changes many times, which does not happen if you use the standard "percent change" definition.

The standard percent change definition is fatally flawed. It will ruin your predictions, with a bias which makes a rise of 100 percent change equal to a decline of 50 percent change!

Steve

**Postscript-Re: Curve fitting. What it is, how to avoid it and how to use it to advantage**

Date :12/4/2005 4:03:20 AM Poster : Sunny Steve, First of all, I would like to thank you for taking the time to go over this procedure with me. I am attempting to answer here your last two posts on this topic. I tried several different combinations, and I have done two different predictions in which I am using the StndNormalZScore and  $\text{lag}(\text{sub}(\ln(\text{close}), \ln(\text{lag}(\text{close}))))$ . I am still unsure if I am using these indicators correctly (according to your instructions). For this reason, I have posted a chart that includes both of these predictions. I have also included data in the chart.

The chart referenced in this post can be downloaded from the following link:  
[Steve Eberbach \(data saved\).cht](#)

Moreover, I tried these prediction both with optimization and without it. I am including the results with optimization.

In addition, one of these predictions predicts the percent change in the open while the other prediction predicts  $\text{mul2}(100, \text{sub}(\ln(\text{close}), \ln(\text{lag}(\text{close}, 1))))$ . Interestingly, if I change this last objective for the first one (percent change in the open), the results are more similar but still not the same. I am wondering if you meant to use this last indicator as a prediction objective or as an input for a prediction. I tried initially a larger set of lags as you suggested (and as I understood ); however, not all of these lags were relevant. In order to save time (and file space), I discarded the other lags, and I left only two within each prediction.

Would you normally include in your predictions a larger set of lags? It appears that the amount of time to predict increases rapidly with several inputs of the same. For this reason, I am wondering if the correct procedure would be to predict without optimization and to allow the prediction wizard to choose the relevant inputs. If you don't mind taking a look, I would value your comments regarding the procedure.

Regards, Sunny

**Postscript-Re: Curve fitting. What it is, how to avoid it and how to use it to advantage**

Date :12/5/2005 11:04:28 AM Poster : Stephen

Mark, Thanks for putting the chart on the web. I downloaded the chart and looked over the trading system. In the chart you used 4 different alpha values, two for the long side, and two for the short side. Shouldn't the alpha for the the trigger be the same as the indicator? This would give you 2 alphas and cut down the degrees of freedom. Looking through the code in Ehlers book I see that he always used the same alpha for the indicator and trigger. Can you explain the use of two different alphas (different alpha in trigger) in a cross over system? How does this avoid curve fitting? - Stephen

**Postscript-Re: Curve fitting. What it is, how to avoid it and how to use it to advantage**

Date :12/5/2005 3:16:15 PM Poster : Mark Simpson

Hi Stephen,

I think this one should have been directed towards Dan.

Mark

**Postscript-Re: Curve fitting. What it is, how to avoid it and how to use it to advantage**

Date :12/5/2005 8:55:22 PM Poster : Dan Melton

Hi Stephen,

The chart you're referring to is simply the "out of the box" Adaptive RVI template that comes with the Cybernetic Indicators. The point of the post really was the problem of the flattened equity curve, which seems to be popping up in several systems I'm experimenting with. My hope was to find a fix that would cause GA to somehow give preference to solutions with an equity curve that was steeper toward the end. Instead, the benefit of the optimization seems to be weighted toward the beginning of the curve. (Mark pointed out that a major shift in volatility seems to contribute here.)

As to linking the alpha parameters: if that is so (i.e. they should be linked), it doesn't appear to be present in the template. Makes sense, though. Thanks for the thought!

Dan Melton

**Re: Curve fitting. What it is, how to avoid it and how to use it to advantage**

Date :11/23/2005 3:33:58 PM Poster : Dan

Hi Mark--

Thanks for the warning on the in-sample data. I had hoped to resolve the equity flat spot, issue, tune up with some exits if possible (i.e. DOF limits), then move on to out of sample data. But I imagine that paper trading right away might not be a bad way to immediately chuck the weak models!

What I'm getting from your post is: find another model! Probably good advice at this

point. I guess the only other option is to follow Ward's example and perhaps optimize for a shorter period (i.e. post change in volatility patterns) but accumulate trades toward DOF guidelines by optimizing over indicators.

Thanks for taking the time to look at the model and posting-  
Dan Melton

**Re: Curve fitting. What it is, how to avoid it and how to use it to advantage**

Date :11/14/2005 3:05:03 PM Poster : Ward.net Webmaster

If it is any consolation, this is happening on our models too, and those of other users we've talked to. 2005 has been a really hard year for models, because the great patterns of 2001-2003 aren't there any longer (2004 was a transition we think). We have found relief in building models in-sample only for 2004, but optimizing over all chart pages. Then you don't lock onto great patterns from the past that no longer exist.

PS - We prefer a different terminology. Both neural nets and GAs curve fit. Curve fitting isn't a bad thing, because that's pretty much all we can do with history using just about any kind of technical models (unless you want to go with Bizarro models). It is OVER-fitting that is the bad thing. In the case at hand we're all fitting the great years because they made so much money.

**Re: Curve fitting. What it is, how to avoid it and how to use it to advantage**

Date :11/17/2005 6:32:52 AM Poster : Dan This IS good to know--thanks for passing this information and tip along! Dan Melton

**Re: Curve fitting. What it is, how to avoid it and how to use it to advantage**

Date :10/22/2005 7:30:49 PM Poster : Maciej

Mark, Are you aware of any way to force the GA to give only integer or fractional results? I trade grains and my corn futures go in steps of 0.25 so a stop of say 200.33 is not really optimal - ideally I'd like to get a result of either 200.25 or 200.50. Or is that the inherent nature of GA prevents such solutions?

**Re: Curve fitting. What it is, how to avoid it and how to use it to advantage**

Date :10/24/2005 11:10:19 AM Poster : Mark Simpson

Hi Maciej,

It's possible to do, but it has to be a time series, as standard parameters can't take indicators as parameters.

If you can provide the formula and identify the parameter you're trying to achieve a trading increment with I can tell you if it's possible or not.

If it turns out to be a time series solution, I have an indicator here that will do the job.

Mark Simpson Bowfort Technologies Inc.

**Re: Curve fitting. What it is, how to avoid it and how to use it to advantage**

Date :10/24/2005 5:02:30 PM Poster : Ward.net Webmaster

The GA can't be made to match minimum price increments on futures, but NeuroShell really needs some sort of rounding feature where prices are concerned, as in stops. However, you can probably effect this yourself by putting rounding in the stop price. For 0.25 increments, use the Quotient indicator, dividing the price by 0.25. Then multiply by 0.25. That should round what the optimizer gives to the nearest quarter point.

## **Suggestions for using Fuzzy Sets add-on**

Date :8/31/2005 4:59:20 PM Poster : MFK

I'm having mixed results using the Fuzzy Sets indicators, and I think the problem is lack of understanding of how to implement the sets in a trading strategy. (The fuzzy logic theory behind them makes so much sense that I'm determined to learn how to use fuzzy sets wisely. If you own this add-on and haven't read Bart Kosko's Fuzzy Thinking, do so immediately.)

First question deals with using the conditional fuzzy sets with the GA optimizer. Let's say I'm using RSI(10) to create a buy signal. For the Sets parameter, I specify a range of 3 to 7. Here's where I get a little confused. What range do I specify for the Set parameter? According to the Help file, I probably want to start at 0 to determine if indeed the indicator contributes nothing. Do I then set the maximum of the parameter range to 7, the maximum number of sets I specified for the optimization? Or do I use the default setting, 0 to 10? I've done the latter, and I wind up with puzzling results when I look at the final trading rules; for example: 3,RSI(10),9. If I'm reading that result correctly, it means the optimizer has divided the RSI indicator into 3 sets, then is using the ninth set to produce the result. How can that be?

Second question deals with the range of data used to create the Sets parameter. The Help files says the minimum and maximum of the range is based on the values observed in the chart. Does that mean all data loaded, including data up to the most recent chart date? Or is the data limited to that used during optimization but not that used to evaluate out of sample results?

Third question seeks some observations and suggestions from experienced users. What could be causing me to get good to very good signals for buys, but few if any signals for sells? In most of my testing, I'm either in the market in a buy-and-hold position or I'm eventually stopped out by a trailing % stop. One thought I've had is I'm just not training the fuzzy sets long enough? Are these time-intensive, similar to Neural Indicators? Or is my confusion with Sets and Set causing my problem?

It would be great if we could establish a forum focused almost exclusively on fuzzy logic and fuzzy sets. (Read Kosko's book to learn why the word "almost" is required in that sentence.)

**classification nets**

Date :9/17/2005 9:23:36 PM Poster : frank Can the Turboprop 2 net be used as a classification net if given enough hidden layers or is it set up to be strictly a dynamic time series net?

**Re: classification nets**

Date :9/19/2005 2:12:03 PM Poster : Jennifer

I've done it before and here's how I remember doing it. Just make an indicator with lead of momentum that is 1 if the market is going up, and -1 if going down. Then use that as an output in a prediction of 0 days ahead. When the prediction is gt 0, you buy, and vice versa. I studied a different kind of ANN in school, but I don't think hidden layers matter at all.



**How to speed up the startegy optimization**

Date :9/20/2005 4:22:20 AM Poster : vvv999vvv When I try to backtest a trading strategy (cross over and cross under strategy) in Forex on 15 minutes chart ( started from 4/5/05)for four tickers, it took me more than two days to finished, any suggestion to speed up the optimization. TIA

**Re: How to speed up the startegy optimization**

Date :9/20/2005 12:25:59 PM Poster : Mark Simpson

Try these in order:

1. Change UNLOADCUSTOMDLLS from True to False in \windows\nstrader.ini This makes sure that the dlls aren't unloaded on each interation of the optimization.
2. Constrain the optimization by setting ranges of values for each of the parameters for each indicator.
3. Examine the model. How many indicators? How many parameters? Try to reduce it.
4. Code it in a programming language.
5. Get a faster machine.

Regards

Mark Simpson

Bowfort Technologies Inc.

**Re: How to speed up the startegy optimization**

Date :10/1/2005 3:54:56 AM Poster : vvv999vvv

Mark,

Thank you

1/ my default setting is false

2/ I have retrained the setting range

3/ it is 3 to four indicators, except a "strategy" from the default indicator, such as maxium value since order is filled

4/ all of them are indicators by Neuroshell, turning points, neural indicator and cybernatics

5/ It is a Xeon pc with 2G ram

THank you for your reply.

**Re: How to speed up the startegy optimization**

Date :9/20/2005 1:41:12 PM Poster : Jennifer

There's an article here called "When Optimization is Really Slow" that helped me.

**Re: How to speed up the startegy optimization**

Date :10/1/2005 3:58:04 AM Poster : vvv999vvv

Jennifer,

Thank you, I have tried to use alternative indicator to do the work, it came with not the result I expected, such as I use "Max" instead of Maxium after the order is filled.

Thank you for your reply

**Re: How to speed up the startegy optimization**

Date :9/27/2005 8:24:48 AM Poster : Maciej

Plenty of articles exists on this site. I've found that my better strategies are already good with very little optimization. Try to limit the ranges of your variables - It can be a bit fastidious to set up the variables and their ranges but it pays. Work progressively - entry+exit+stop for both long and short = max. If you work progressively, say entries only then add exits and then stops you'll quickly get a feel for the cost of each component of a strategy. There are further articles her on why for instance stops can add to the optimization process a lot of time.

**Re: How to speed up the startegy optimization**

Date :10/1/2005 4:11:20 AM Poster : vvv999vvv

Hi, Maciej

I agree, I just try to built a simple system with a few indicators

For instant, I try to smooth the data before I applied the strategy in order to reduced the whipsaw on hour chart (I think 4 hour chart will do better, unfortunately, Neuralshell has no 4 hour interval chart, it is one of its drawback), Then I applied one cybernatic cross over and below strategies, it takes ages to finish any strategy.

I agree simple is good, but sometimes, it is hard to acheive. Like recently, I found a startegy of over 5000% profit ( 1 % margin on forex ), but unfortunately, in real trade on range market, it is keep on losing as the lag is more than 8 hours , so when the signal is given, it will turn to other side very soon, any suggestions? TIA

**Re: How to speed up the startegy optimization**

Date :10/3/2005 3:55:48 PM Poster : Maciej

I haven't tried using 4 hourly charts but there is a MT (Multiple Timeframes) set of indicators that were donated by a fellow users available on this site. You may want to experiment with them. I smooth data a lot. I'm particularly fond of the Jurik JMA even though I find Jurik's software keys a real pain whenever I upgrade a bios -Jurik want's the name and copy of the bios like he doesn't believe you. Otherwise the software is fine. He has some other tools to smooth data but they prbably don't lend themselves well to real-time (JMA is ok). I find that in back testing futures I can hit the 100+% returns quite easiily but its a lot more difficult to get that in real life + you need guts to survive the drawdowns sometimes.

**Re: How to speed up the startegy optimization**

Date :10/5/2005 5:19:22 AM Poster : vvv999vvv

Hi, Maciej

Thank you for reply.

The reason I think of four hour chart is we shall have less whipsaws compare with the one hour chart, and day chart is even better on this aspect, I tried a backtest with day chart on 4 main forex pairs and returns all winner without loser by applying Cybernetic Laguerre filter, the drawback of Laguerre filter is for very long run. On the other hand, Cybernetic 2-pole and 3-pole super smoother are good, but lag always cause some troubles, as times goes on, it is

getting better results.

For forex trading, the usual margin is 1%, it can return over 2000% on Laguerre filter and 5000% on 2-pole or 3-pole filter (max over 9000% on Chf in hourly chart), personally, I recommend it is worthwhile to read on the book.

Good trade

### **Suggestion for automating Neuroshell**

Date :9/27/2005 9:38:05 PM Poster : Sunny I have been thinking about how nice it would be able to go on vacation for the summer and to be able to leave Neuroshell trading on its own for me. However, after thinking about it and talking with other users of the program, I have concluded that this would be a perfect way of losing money. More experienced traders and users of Neuroshell have told me that this would not be possible since it would be dangerous to leave the program trading without supervision. I have thought about it, and I have come up with the same conclusion. Suppose I had the perfect trading strategy for trading something with Neuroshell. This trading strategy would be working on intraday data. Most users (including Steve Ward) would probably say that after a few days of trading, I would require to retrain all my predictions including my trading strategy. I don't know if they say this out of experience, or if they say this from watching a degradation of certain parameters; however, this appears to me almost a unanimous conclusion. Now, in order to avoid this conclusion the program would have to detect these degradation of parameters itself, and it would have to retrain both its predictions and trading strategy by itself. Alas, this currently is not possible to do since the program is unable to retrain all of its predictions and trading strategy(s) on its own, but I thought of placing this note on the forum since the good people of Ward are currently working on an upgrade to the program. Perhaps on the next upgrade they will figure out a way for the program to test which indicators work best in predicting something. Perhaps it will even learn how to decide which inputs work best for predicting something that the program chooses on its own. Now that would be real artificial intelligence working at its best... Regards, Sunny

### **Re: Suggestion for automating Neuroshell**

Date :9/29/2005 12:28:48 AM Poster : MannyL I think maybe you asking for more of our programming friends than may be realistic, Sunny, but it sure would be nice! Here's a request from me. I'd be curious to know if anyone else would think that such a feature would be usefull. Here goes: I'd like to be able to "tag" a chart as "active" (or some such designation). Then have a quick key command that would have all such "tagged" charts update (as if I had opened each one individually) and then output any new trade signals to a text file (that had the same name as the chart). Such a feature would help me go a long way towards automating the whole trading process and remove human error.

### **Re: Suggestion for automating Neuroshell**

Date :10/3/2005 5:21:23 PM Poster : Sunny Manny, Your idea runs pretty close to what I had in mind with the exception of the text file. It sounds to me like you are running some type of batch process for different securities. You are essentially trying to automate the training process (for which I am coming to the conclusion that all neural network software companies should make a full disclosure to new customers --CUSTOMER BEWARE, THE RETRAINING OF NETS MIGHT REDUCE YOUR FAMILY AND FRIEND LIFE BY A CONSIDERABLE AMOUNT) which at this stage of software development appears to be back in the dark ages since the user is actually a slave for the program in order to keep it actualized. I have been researching some Macro software programs that do part of this; I have essentially found that you could retrain some predictions; however, once in a while I get a message, before completing the retraining process, asking me if I want to retrain the

Trading Strategy (essentially popping at non predictable places in the retraining process). My Trading Strategies, as you might imagine, depend on different predictions. This makes it difficult for me to implement a Macro strategy to retrain the nets. I still think the ideal situation would be to have Neuroshell ask you if you want to have the nets retrained and how often. Regards, Sunny

**Re: Suggestion for automating Neuroshell**

Date :10/4/2005 3:23:07 PM Poster : Steve Ward >I still think the ideal situation would be to have Neuroshell ask you if you want to have the nets retrained and how often. That is why we built Adaptive TurboProp 2 and Adaptive Net Indicators. AT2 retrains on the interval you specify, and ANI are always retraining. Even with the Prediction Wizard, I'm a little confused. All you have to do is hit the Retrain button and off it goes. If you have 50 stocks in a chart they all retrain. If you have a lot of charts, yes, they will have to be all loaded, but in release 5.0, we have a "workspace" that contains x charts - you just have to load a workspace and all the charts come up.

**Re: Suggestion for automating Neuroshell**

Date :10/5/2005 2:35:57 AM Poster : Sunny Steve, My problem as far as retraining is concerned has to do with the fact that I am working with an unusually large number of predictions, and, moreover, these predictions serve as input to other predictions, and these final predictions serve as inputs to different trading strategies. If I had a single prediction, then hitting the retrain button would be no big deal. The problem is that after I hit the retrain button on the first prediction, I have to pay attention when it completes its predictions, and then I have to open up the next prediction and repeat the process until I finish. In the meantime, I get pop up windows (at different stages of the retraining process) asking me if I would like to retrain the prediction that depends on the previous predictions as inputs, or if I would like to retrain the trading strategy. The only reason I go through this masochistic process is due to the fact that the relationships built hold well over time. I have tried less complicated relationships with lesser number of predictions; however, the results breakdown over time. The whole process can take several hours every weekend. I did buy sometime ago from Marge one of the indicators that you mentioned; however, I got confused as to how to enter all of the many predictions to be retrained into it, and I never actually got to use it. My preferred scenario would be one where the program actually retrains all of these predictions on its own. This would free up a huge chunk of my time every weekend, and I could use this extra time to sleep, to relax, or to be with my family. Best regards,  
Sunny

**Re: Suggestion for automating Neuroshell**

Date :10/4/2005 3:40:39 PM Poster : Ward.net Webmaster  
All charts update automatically when you bring them up if new data is there - no tagging is necessary. In release 5.0 there is a feature we call the Trade Pump - a programmable interface that gets trades when they occur into your program. You can tag which charts send out trades. You can save trades or send them to a

broker. At least one brokerage will be included. We are currently working on an example for Trade Pump that emails the trades to an email list. Maybe those things will help you.

### **t tests and neural net based trades**

Date :9/29/2005 12:47:20 AM Poster : MannyL

I'm working with some software that performs a Student's t test on an input series of trades so that a confidence level of profitability can be determined. (Market System Analyzer [www.adaptrade.com](http://www.adaptrade.com) It's vey good.) In order to be meaningful it is necessary to know the number of conditions in the trading system that if changed would change the result. The length of the moving averages in an moving average crossover system would consititute such variables. The number of inputs and the number of neurons in a neural net would certainly count as such variables as well. My question is should I be accounting for the number of weights in the net? In other words instead of adding the number of inputs and the number of neurons should I be multiplying them? Anyone have any insights here? Thanks in advance.

### **Re: t tests and neural net based trades**

Date :9/29/2005 1:14:05 PM Poster : Steve Ward

The t test or student t test can indeed be used to calculate a confidence range of a population mean from a sample mean (in this case the sample consists of trades from a fixed system). It is a simple calculation any stat book has, so you don't really need software. Degrees of freedom for the t test in my stat book is defined as the number of observations minus the number of parameters to be estimated beforehand (e.g, if you are estimating the mean, then the number of parameters is one). It doesn't have anything to do with the number of parameters that created the model that created the population. (We aren't talking about the same degrees of freedom used to estimate standard error of a regression! ) Therefore, and especially since weights are fixed in both the sample and the population, I don't consider it valid to use neurons, weights, or even inputs to the net as "parameters" to be substracted from the population size. I strongly question even defining parameters for the t test as rules or conditions in the trading strategy. However, if you want to go along with that, then our neural nets have either 2 or 4 threshold rules, depending on if you allow both longs and shorts, or reversals:

net prediction > long entry threshold net prediction < long exit threshold net prediction < short entry threshold net prediction > short exit threshold

### **Re: t tests and neural net based trades**

Date :9/30/2005 1:13:31 AM Poster : MannyL

Thanks for the feedback, Steve. That's what I needed to know.

### **Re: t tests and neural net based trades**

Date :10/1/2005 6:12:46 AM Poster : chris wong

be careful with statistics. a big issue in using tests like this is making sure you sample from the right population. trades made in backtesting aren't of the same population as trades made later. use your real trades done after you have built your system to sample real trades into the future, then the t test might be more accurate. the more trades sampled the better.

### **Re: t tests and neural net based trades**

Date :10/23/2005 4:54:51 PM Poster : Greg Kramer Student t may not be an appropriate test because the distribution of trades may not be normal. In any event, the number of variables can be determined by opening the Trading Rules tab under Detailed Analysis for the strategy. Count every number for all conditions that wasn't linked for optimization (i.e., count each link parameter only once). The total is number of parameters.

**Re: t tests and neural net based trades**

Date :11/29/2005 3:26:36 PM Poster : Sunny Greg, I have been working on the side with Excel. It allows me to determine what percentage of observations fall under a normal distribution, a gaussian distribution, a gamma distribution, etc. I get a number between 0 and 1 for each test that I make to determine the type of probability density that my data is most likely to match. Once I have an answer, I can continue with other questions that are appropriate to the type of probability density at hand. I suppose if I had the same in NS, it would be something like this: If probability density matches normal distribution by 0.8 or more, then do the following, else, if the probability density matches a gamma distribution by 0.8 or more, then do the following. I have been wondering if it is possible to do these types of questions in NS, but I am not sure if we have different probability densities available. I think it would be useful if someone would make a complete statistical add-on with different statistical tests to try in NS. I wish I could do this myself; however, my programming abilities are quite limited. Regards, Sunny



**Strategy with no loser**

Date :10/3/2005 6:11:38 AM Poster : vvv999vvv For those cybernatic users, The following startegy returns no loser, all winners, thought the return is not that big ( all over 2000% for 1% margin), it applies to four main foreign currency, EUR, CHF, Jpy and GBP Optimize Itrend trigger (Laguere filter (high+low)/2) cross above / below Itrend (Laguere filter (high+low)/2)

**Re: Strategy with no loser**

Date :10/3/2005 3:42:27 PM Poster : Maciej Do you have a NSDT type formula for a Laguerre filter?

**Re: Strategy with no loser**

Date :10/5/2005 6:53:26 AM Poster : vvv999vvv Hi, Maciej There is a add-on from NST, Cybernetics Also, you can found from his book of Cybernetic analysis for stocks and futures by John Ehler, imho, read his book before buy the add-ons, there is easy language and EFS code over there

**Re: Strategy with no loser**

Date :10/5/2005 8:13:32 AM Poster : Sunny vvv, With which time frames are you using this indicator, for instance, daily, hourly, etc.? In Laguere filter (high+low)/2) are you actually changing the PriceIn of High and low for divide(add(high, low),2)? How many days ahead are you predicting? What are you predicting, for instance, %change in the open? Regards, Sunny

**Re: Strategy with no loser**

Date :10/5/2005 3:22:23 PM Poster : vvv999vvv Hi, Sunny It is base on day chart, Yes, it is average of high and low, or use NST default PriveIn = Price Use default NST setting, it is about less than 2 years IT is utimumm in return Good luck, good trade

**Re: Strategy with no loser**

Date :10/8/2005 11:28:06 PM Poster : Sunny  
vvv,

I tried your idea with Euro on daily charts.

For input I entered the cross above from the crossover category, for instance, (Laguere filter (PriveIn ) cross (PriveIn).

I placed 3 walkforwards of 6 months and 3 optimal of 6 months.

I left the % change in the open and the 10 days to predict as they were before.

I changed in training 5 years max and 4 years minim.

I chose Max winners - losers

However, I don't have any good results with this.

Is there anything else that I should change?

TIA

Regards,  
Sunny

**Re: Strategy with no loser**

Date :10/10/2005 4:57:13 AM Poster : vvv999vvv

Hi, Sunny

Rules

BUY LONG CONDITIONS:

CrossAbove(Cyber3\_ITrendTrigger(Cyber14\_LaguerreFilter(Price(High,Low),0.25),0.126),Cyber3\_ITrend(Cyber14\_LaguerreFilter(Price(High,Low),0.82),0.122))

SELL SHORT CONDITIONS:

CrossBelow(Cyber3\_ITrendTrigger(Cyber14\_LaguerreFilter(Price(High,Low),0.91),0.117),Cyber3\_ITrend(Cyber14\_LaguerreFilter(Price(High,Low),0.07),0.043))

Good trade

**q**

Date :10/10/2005 7:11:11 PM Poster : Sunny

Hi vvv,

I entered your formula into the trading strategy, and I did not quite obtain the number of losers that you suggested. This leads me to think that perhaps I missed something when I entered the formula; however, it appears to look like your formula. In fact, I tried it both with average(high,low) and pricein(high,low).

On the other hand, the number of losers is relatively low compared to the number of winners ( I have included my trading strategy stats at the end of my post).

I tried a couple of things to make this a little more realistic.

I changed in the trading strategy the default buy a fixed number of lots for buy as many lots as possible with current account balance.

I also changed the optimization to optimize up until 6 months from now. Therefore, there is paper trading for 6 months.

As you will be able to see, the results were not that fantastic by doing this; however, this is a good test of a model since you apply unseen data to the optimized model.

I suppose that the optimization parameters are changing through the whole price curve, and fixed parameters do not appear to be "transportable" to an untested time period.

Perhaps you or one of our more knowledgeable users in the forum can address this issue.

Your model is overall better than most; however, I think you could do better by including some content into the model rather than aiming for optimized parameters, but perhaps I am assuming incorrectly that you are not including content, and you are in fact using it together with a complex relational model.

Regards,

Sunny

Enclosure: trading strategy stats

TRADING STRATEGY Forex Chart #1.cht Euro (EUR A0-FX) Current 10/10/2005 5:56:09 PM

STATISTICS Performance Statistic All Trades Long Only Short Only Start Date

1/4/1999 End Date 10/9/2005 Beginning Price 1.1804 Ending Price 1.2115  
Change in Price 0.0311 Percent Change in Price 2.6% Annual Percent Change in  
Price 0.4%

Return on Trades 100.2% 59.2% 41.0% Annual Return on Trades 14.8% 8.7% 6.1%  
Return on Account 101.5% 71.7% 43.2% Annual Return on Account 15.0% 10.6% 6.4%  
Net Profit \$ 1.0682 \$ 0.6136 \$ 0.4546 Gross Profit \$ 1.2153 \$ 0.6605 \$ 0.5548 Gross  
Loss \$ 0.1471 \$ 0.0469 \$ 0.1002 Ratio Gross Profit/Loss 8.26 14.08 5.54

Percent Profitable Trades 77.1% 82.4% 72.2% Number Trades 35 17 18 Number  
Winning Trades 27 14 13 Number Losing Trades 8 3 5

Largest Winning Trade Profit \$ 0.134 \$ 0.134 \$ 0.0986 Largest Losing Trade Loss \$  
0.0415 \$ 0.0383 \$ 0.0415

Average Trade Profit \$ 0.03 \$ 0.04 \$ 0.03 Average Winning Trade Profit \$ 0.05 \$ 0.05 \$  
0.04 Average Losing Trade Loss \$ 0.02 \$ 0.02 \$ 0.02 Ratio Avg Win/Avg Loss 2.45  
3.02 2.13

Maximum Consecutive Winners 8 7 6 Maximum Consecutive Losers 3 1 2

Average Trade Span 47 bars 40 bars 53 bars Average Winning Trade Span 52 bars 40  
bars 65 bars Average Losing Trade Span 29 bars 38 bars 23 bars

Longest Trade Span 221 bars 126 bars 221 bars Longest Winning Trade Span 221 bars  
126 bars 221 bars Longest Losing Trade Span 64 bars 64 bars 50 bars

Largest Lots Traded 1 1 1 Largest Winning Lots Traded 1 1 1 Largest Losing Lots  
Traded 1 1 1

Average Lots Traded 1 1 1 Average Winning Lots Traded 1 1 1 Average Losing Lots  
Traded 1 1 1

Commissions Paid \$ 0.00 \$ 0.00 \$ 0.00 Maximum Drawdown \$ 0.0824 \$ 0.0599 \$  
0.0751 Maximum Open Trade Drawdown \$ 0.0751 \$ 0.0599 \$ 0.0751 Required  
Account Size \$ 1.0525 \$ 0.8553 \$ 1.0525

**Re: q**

Date :10/11/2005 2:21:13 PM Poster : vvv999vvv

Hi, Sunny

TRADING STRATEGY

emp6.cht Euro (EUR A0-FX) Current 10/11/2005 11:16:31 AM

STATISTICS

Performance Statistic All Trades Long Only Short Only Start Date 5/4/2004 End Date  
9/30/2005 Beginning Price 1.2098 Ending Price 1.2057 Change in Price -0.0041  
Percent Change in Price -0.3% Annual Percent Change in Price -0.2%

Return on Trades 3025.2% 1572.6% 1452.6% Annual Return on Trades 2144.1%  
1114.6% 1029.5%

Return on Account 3159.2% 1570.5% 0.0% Annual Return  
on Account 2239.0% 1113.1% 0.0%

Net Profit \$ 0.3816 \$ 0.1897 \$ 0.1919 Gross Profit \$  
0.3816 \$ 0.1897 \$ 0.1919 Gross Loss \$ 0.00 \$ 0.00 \$  
0.00 Ratio Gross Profit/Loss 0.00 0.00 0.00

Percent Profitable Trades 100.0% 100.0% 100.0% Number Trades 4 2 2 Number Winning Trades 4 2 2 Number Losing Trades 0 0 0

Largest Winning Trade Profit \$ 0.1434 \$ 0.1375 \$ 0.1434  
Largest Losing Trade Loss \$ 0.00 \$ 0.00 \$ 0.00

Average Trade Profit \$ 0.10 \$ 0.09 \$ 0.10 Average Winning Trade Profit \$ 0.10 \$ 0.09 \$ 0.10 Average Losing Trade Loss \$ 0.00 \$ 0.00 \$ 0.00 Ratio Avg Win/Avg Loss 0.00 0.00 0.00

Maximum Consecutive Winners 4 2 2 Maximum Consecutive Losers 0 0 0

Average Trade Span 73 bars 86 bars 59 bars Average Winning Trade Span 73 bars 86 bars 59 bars Average Losing Trade Span 0 bars 0 bars 0 bars

Longest Trade Span 144 bars 144 bars 98 bars Longest Winning Trade Span 144 bars 144 bars 98 bars Longest Losing Trade Span 0 bars 0 bars 0 bars

Largest Lots Traded 1 1 1 Largest Winning Lots Traded 1 1 1 Largest Losing Lots Traded 0 0 0

Average Lots Traded 1 1 1 Average Winning Lots Traded 1 1 1 Average Losing Lots Traded 0 0 0

Commissions Paid \$ 0.00 \$ 0.00 \$ 0.00 Maximum Drawdown \$ 0.0091 \$ 0.0091 \$ 0.0042 Maximum Open Trade Drawdown \$ 0.0091 \$ 0.0091 \$ 0.0042 Required Account Size \$ 0.01208 \$ 0.01208 \$ 0.00

#### TRADE BY TRADE

Date	Signal	Lots	Fill	Date	Price	Commission	%Return	Profit/Loss	Cum %Ret	Cum Profit/Loss
8/24/2004	Long Entry	1		8/25/2004				\$ 1.2079		\$ 0.00
3/11/2005	Long Exit	1		3/14/2005				\$ 0.1375		\$ 0.1375
3/11/2005	Short Entry	1		3/14/2005				\$ 1.3454		\$ 0.00
7/26/2005	Short Exit	1		7/27/2005				\$ 0.1434		\$ 0.2809
7/26/2005	Long Entry	1		7/27/2005				\$ 1.202		\$ 0.00
9/2/2005	Long Exit	1		9/5/2005				\$ 0.0522		\$ 0.3331
9/2/2005	Short Entry	1		9/5/2005				\$ 1.2542		\$ 0.00
9/30/2005	Short Value	1		9/30/2005				\$ 0.0485		\$ 0.3816

#### TRADING RULES

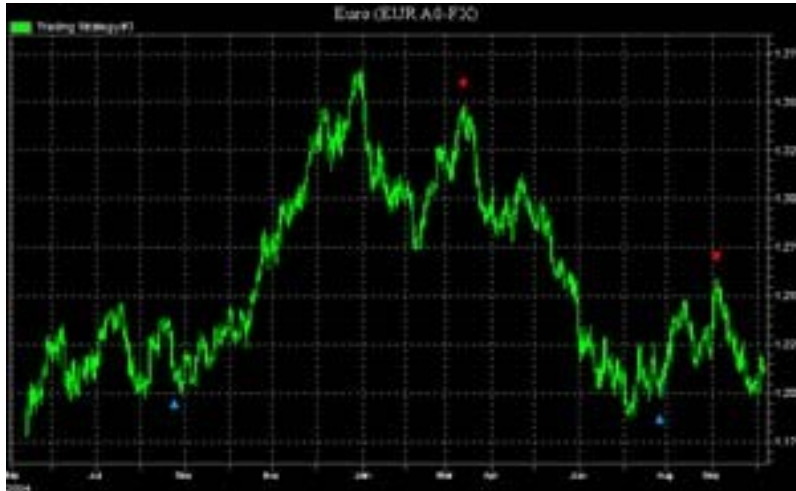
Rules BUY LONG CONDITIONS:

CrossAbove(Cyber3\_ITrendTrigger(Cyber14\_LaguerreFilter(Price(High,Low),0.25),0.126),Cyber3\_ITrend(Cyber14\_LaguerreFilter(Price(High,Low),0.82),0.122))

SELL SHORT CONDITIONS:

CrossBelow(Cyber3\_ITrendTrigger(Cyber14\_LaguerreFilter(Price(High,Low),0.91),0.117),Cyber3\_ITrend(Cyber14\_LaguerreFilter(Price(High,Low),0.07),0.043))

All the conditions are default.



**Re: q**

Date :10/11/2005 2:26:12 PM Poster : vvv999vvv

Hi, Sunny

This is the optimized rules: TRADING STRATEGY

emp6.cht Euro (EUR A0-FX) (Optimal) 10/11/2005 11:22:54 AM

**STATISTICS**

Performance Statistic All Trades Long Only Short Only Start Date 5/4/2004 End Date 9/30/2005 Beginning Price 1.2098 Ending Price 1.2057 Change in Price -0.0041 Percent Change in Price -0.3% Annual Percent Change in Price -0.2%

Return on Trades 3025.2% 1572.6% 1452.6% Annual Return on Trades 2144.1% 1114.6% 1029.5%

Return on Account 3159.2% 1570.5% 0.0% Annual Return on Account 2239.0% 1113.1% 0.0%

Net Profit \$ 0.3816 \$ 0.1897 \$ 0.1919 Gross Profit \$ 0.3816 \$ 0.1897 \$ 0.1919 Gross Loss \$ 0.00 \$ 0.00 \$ 0.00 Ratio Gross Profit/Loss 0.00 0.00 0.00

Percent Profitable Trades 100.0% 100.0% 100.0% Number Trades 4 2 2 Number Winning Trades 4 2 2 Number Losing Trades 0 0 0

Largest Winning Trade Profit \$ 0.1434 \$ 0.1375 \$ 0.1434 Largest Losing Trade Loss \$ 0.00 \$ 0.00 \$ 0.00

Average Trade Profit \$ 0.10 \$ 0.09 \$ 0.10 Average Winning Trade Profit \$ 0.10 \$ 0.09 \$ 0.10 Average Losing Trade Loss \$ 0.00 \$ 0.00 \$ 0.00 Ratio Avg Win/Avg Loss 0.00 0.00 0.00

Maximum Consecutive Winners 4 2 2 Maximum Consecutive Losers 0 0 0

Average Trade Span 73 bars 86 bars 59 bars Average Winning Trade Span 73 bars 86 bars 59 bars Average Losing Trade Span 0 bars 0 bars 0 bars

Longest Trade Span 144 bars 144 bars 98 bars Longest Winning Trade Span 144 bars 144 bars 98 bars Longest Losing Trade Span 0 bars 0 bars 0 bars

Largest Lots Traded 1 1 1 Largest Winning Lots Traded 1 1 1 Largest Losing Lots Traded 0 0 0

Average Lots Traded 1 1 1 Average Winning Lots Traded 1 1 1 Average Losing Lots

Traded 0 0 0

Commissions Paid \$ 0.00 \$ 0.00 \$ 0.00 Maximum Drawdown \$ 0.0091 \$ 0.0091 \$ 0.0042  
Maximum Open Trade Drawdown \$ 0.0091 \$ 0.0091 \$ 0.0042 Required  
Account Size \$ 0.01208 \$ 0.01208 \$ 0.00

#### TRADE BY TRADE

Date	Signal	Lots	Fill	Date	Price	Commission	%Return	Profit/Loss	Cum	%Ret	Cum
8/24/2004	Long Entry 1			8/25/2004	\$ 1.2079	\$ 0.00					3/11/2005 Long Exit 1
3/14/2005	\$ 1.3454	\$ 0.00	1138.34%	\$ 0.1375	1138.34%	\$ 0.1375	3/11/2005 Short				Entry 1
3/14/2005	\$ 1.3454	\$ 0.00		7/26/2005	Short Exit 1	7/27/2005	\$ 1.202	\$ 0.00			
	1065.85%	\$ 0.1434	2204.19%	\$ 0.2809	7/26/2005 Long Entry 1	7/27/2005	\$ 1.202	\$ 0.00			
	0.00	9/2/2005 Long Exit 1	9/5/2005	\$ 1.2542	\$ 0.00	434.28%	\$ 0.0522	2638.47%	\$		
	0.3331	9/2/2005 Short Entry 1	9/5/2005	\$ 1.2542	\$ 0.00	9/30/2005 Short Value 1					
		9/30/2005	\$ 1.2057	\$ 0.00	386.7%	\$ 0.0485	3025.17%	\$ 0.3816			

#### TRADING RULES

Rules

BUY LONG CONDITIONS:

CrossAbove(Cyber3\_ITrendTrigger(Cyber14\_LaguerreFilter(Price(High,Low),0.25),0.126),Cyber3\_ITrend(Cyber14\_LaguerreFilter(Price(High,Low),0.82),0.122)) SELL SHORT

CONDITIONS:

CrossBelow(Cyber3\_ITrendTrigger(Cyber14\_LaguerreFilter(Price(High,Low),0.91),0.117),Cyber3\_ITrend(Cyber14\_LaguerreFilter(Price(High,Low),0.07),0.043))

#### Re: q

Date :10/11/2005 3:34:00 PM Poster : vvv999vvv

Hi, Sunny,

I think I got the answer for , your question, shorten your time duration, as so long time duration make the NN too many compromise.

#### Re: q

Date :10/12/2005 1:19:30 PM Poster : Sunny

Hi vvv,

Thank you for your reply.

I will try it later with a shorter time frame as you suggested.

Unfortunately, this week I am a little behind things so I will try to do this in the near future.

I agree with Jenny about the StochRsi, I have also gotten decent results with it in the past. In addition, I have done some experiments with the turning points indicator, but as some of the more experienced users have pointed out lag and content are issues to consider when building a useful model.

Some of my main goals for a good model:

- 1- It should work with different instruments.
- 2- It should pass the test of time (be useful regardless of market conditions and time).

Regards,

Sunny

**Re: q**

Date :10/12/2005 2:53:04 PM Poster : vvv999vvv

Hi, Sunny

To my point of view, this strategy is only suitable for long term player.

If you are free, try the cross over strategies of Adaptive RVI, this give much better results, winner to loser ratio is more than 2:1

Good luck

**TRADING STRATEGY**

mj1.cht Euro (EUR A0-FX) Current 10/12/2005 11:49:56 AM

**STATISTICS**

Performance Statistic All Trades Long Only Short Only Start Date 3/30/2005 1:00:00 AM End Date 10/7/2005 3:00:00 PM Beginning Price 1.2964 Ending Price 1.2123 Change in Price -0.0841 Percent Change in Price -6.5% Annual Percent Change in Price -12.3%

Return on Trades 4036.5% 1723.3% 2313.2% Annual Return on Trades 7650.4% 3266.1% 4384.2%

Return on Account 3849.1% 2394.6% 2223.5% Annual Return on Account 7295.1% 4538.4% 4214.2%

Net Profit \$ 0.4963 \$ 0.2096 \$ 0.2867 Gross Profit \$ 0.6215 \$ 0.2807 \$ 0.3408 Gross Loss \$ 0.1252 \$ 0.0711 \$ 0.0541 Ratio Gross Profit/Loss 4.96 3.95 6.30

Percent Profitable Trades 64.8% 66.7% 63.0% Number Trades 162 81 81 Number Winning Trades 105 54 51 Number Losing Trades 54 26 28

Largest Winning Trade Profit \$ 0.0274 \$ 0.0271 \$ 0.0274 Largest Losing Trade Loss \$ 0.01 \$ 0.01 \$ 0.0075

Average Trade Profit \$ 0.00 \$ 0.00 \$ 0.00 Average Winning Trade Profit \$ 0.01 \$ 0.01 \$ 0.01 Average Losing Trade Loss \$ 0.00 \$ 0.00 \$ 0.00 Ratio Avg Win/Avg Loss 2.55 1.90 3.46

Maximum Consecutive Winners 8 7 7 Maximum Consecutive Losers 4 5 4

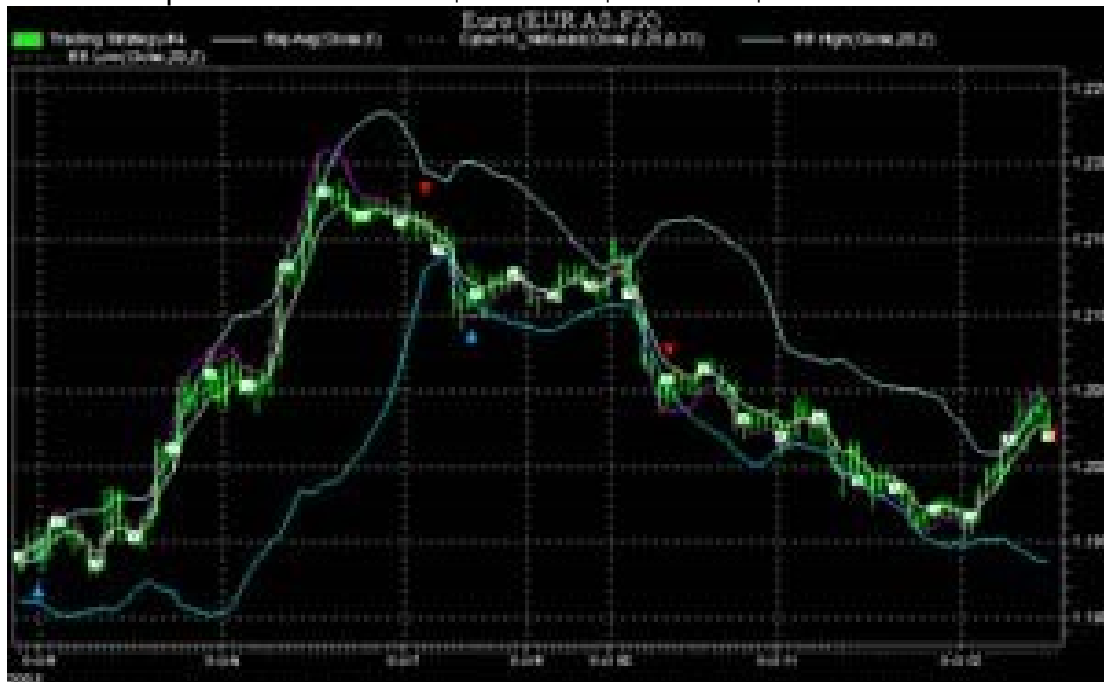
Average Trade Span 22 bars 18 bars 25 bars Average Winning Trade Span 25 bars 21 bars 30 bars Average Losing Trade Span 15 bars 13 bars 17 bars

Longest Trade Span 87 bars 83 bars 87 bars Longest Winning Trade Span 87 bars 83 bars 87 bars Longest Losing Trade Span 38 bars 27 bars 38 bars

Largest Lots Traded 1 1 1 Largest Winning Lots Traded 1 1 1 Largest Losing Lots Traded 1 1 1

Average Lots Traded 1 1 1 Average Winning Lots Traded 1 1 1 Average Losing Lots Traded 1 1 1

Commissions Paid \$ 0.00 \$ 0.00 \$ 0.00 Maximum Drawdown \$ 0.025 \$  
0.0214 \$ 0.0164 Maximum Open Trade Drawdown \$ 0.0135 \$ 0.011 \$  
0.0135 Required Account Size \$ 0.01289 \$ 0.00875 \$ 0.01289



**Re: q**

Date :10/29/2005 3:16:38 PM Poster : Sunny

Hi vvv,

Sorry for the delay, but I just got a moment to try your idea, and you were right.

I tried your strategy, and it gives no losers.

I have modified your idea slightly (see below).

Try it on 15-min intraday.

(last 3 or 4 months).

Produces 8 winners and no losers.

I also attempted your Adaptive RVI strategy; however, I was unsure on how to apply it.

Thanks for the idea.

Regards,

Sunny

Rules

BUY LONG CONDITIONS:

A>B A = ValleyProb(High,Low,Close,36,600) B = 1 (set it between .1 to 1 in search parameter rule)

AND

CrossAbove(Cyber3\_ITrendTrigger(Cyber14\_LaguerreFilter(Price(High,Low),0.25),0.126),Cyber3\_ITrend(Cyber14\_LaguerreFilter(Price(High,Low),0.82),0.122))

LONG EXIT CONDITIONS:



A>B A = PeakProb(High,Low,Close,36,600) B = 1 (set it between .1 to 1 in search parameter rule)

AND

CrossBelow(Cyber3\_ITrendTrigger(Cyber14\_LaguerreFilter(Price(High,Low),0.91),0.117),Cyber3\_ITrend(Cyber14\_LaguerreFilter(Price(High,Low),0.07),0.043))

**Re: q**

Date :10/30/2005 2:42:19 PM Poster : vvv999vvv\_88 Hi, Sunny Nice to hear that you are success on the strategy. I did try your idea before, but not on 15 min chart, Laguerrie filter, to my point of view, it is a long term filter, it smooth out most of the whipsaws, that is why you got so little trade on 15 min chart, read the book again, you will discover more interesting things, Ehler is so bright that that he wrote the book for many levels, and you can try the net lead as well. Use the similar idea on Adaptive RVI, hope you will find some more profitable startegies, what is the profit and lose ratio and annual return on your startegy? Good trade Victor

**Re: q**

Date :11/4/2005 4:53:30 AM Poster : Reyden Hi, Dumb question, where can I find the Valleyprob indicator. Thanks On 10/30/2005 2:42:19 PM vvv999vvv\_88 wrote: Hi, Sunny Nice to hear that you are success on the strategy. I did try your idea before, but not on 15 min chart, Laguerrie filter, to my point of view, it is a long term filter, it smooth out most of the whipsaws, that is why you got so little trade on 15 min chart, read the book again, you will discover more interesting things, Ehler is so bright that that he wrote the book for many levels, and you can try the net lead as well. Use the similar idea on Adaptive RVI, hope you will find some more profitable startegies, what is the profit and lose ratio and annual return on your startegy? Good trade Victor

**Re: q**

Date :11/4/2005 3:10:44 PM Poster : Ward.net Webmaster Not dumb. It is part of our Turning Points add-on.

**Re: Strategy with no loser**

Date :10/10/2005 8:35:51 AM Poster : Jennifer Thanks. I had a similar success, a few losers, but overall very good. I also found the stochastic rsi to be excellent as a neural net input.

**Re: Strategy with no loser**

Date :10/10/2005 3:55:40 PM Poster : vvv999vvv Hi, Jennifer According to my many backtesting, I found only way you can make a big gain is not imposing any exit and trailing stop conditions, and let the trained strategy run for certain period before use it on trade in order to solve the lag problems. Now I can easily make startegy of over 5000% gain but with lag, this will make you loss a lot in the range trade. At the meantime I am only backtesting the Cybernetic indicators, it is hard for me to found a way incorporating the turning point indicators and neural indicators and make such a gain like cybernetic on its own. It is amazing to note that one of the forum who applied the uncertainty principle on price, if so, we should consider the duality as wll,

it it a wave as well as trend. Good luck

### **Survey - How many of you are successful traders?**

Date :10/5/2005 10:59:46 PM Poster : Alan Rhodes I am just curious as to how many people in this forum are highly successful traders. I will define highly successful as grossing 50% profit per year every year over a five year period. This would exclude those who get a hot streak. Or give me your thoughts as to what makes up a highly successful trader? To me, highly successful requires two things, first a high profit margin and two sustaining it over an extended period of time. This would exclude those who get a hot streak. Also a good trader should have enough diversity so that they cannot claim a drawdown in a single market as an excuse to say why they did poorly one year (obviously, I'll make exceptions for four 100% plus years and a -20% year). I do not expect anybody to give away any trade secrets; I am just looking for inspiration.

### **Re: Survey - How many of you are successful traders?**

Date :10/6/2005 8:53:44 AM Poster : Steve Ward It is clear to me why you don't think you are highly successful. It's your definition. Anybody who does that well isn't wasting time on this forum, they're enjoying their yacht! Come on, this isn't the 90's. If you don't have realistic expectations, you're going to be throwing away a lot good models and pulling your hair out for nothing. Take a look at hedge fund returns lately, and they (arguably) have the best traders in the business.

### **Re: Survey - How many of you are successful traders?**

Date :10/7/2005 1:28:20 PM Poster : Maciej

It looks to me as if you're confounding NSDT with trading. To me this is a tool to help me trade; it can help a lot but short of having a fully automated trading system NSDT is primarily going to give, I hope, reasonable entry, perhaps exit signals. When I reach your 50% goals then I'll be doing what Steve suggests, until then I'll make do with more modest progress and continue to try to control my emotions better when trading.

### **Re: Survey -How many of you are successful traders?**

Date :10/11/2005 2:17:48 AM Poster : Alan Rhodes These are the assumptions behind all my work, and I would like your opinion if you think my assumptions are wrong.

1. It is possible to develop a trading system that is somewhat randomly successful at 70% of trades, year after year after year (allowing reoptimization of course, but a predetermined rate, not when it seems to stop working.). Though I am studying futures, let's use as an example a stock system. IF such a system was 100% accurate in 2003, 70% accurate in 2004, and 40% accurate in 2005, it would not impress me. Even though such a system is 70% successful, results are not random.
2. Such a system would have over two time's gross earnings to gross losses (actually I would be ecstatic with a system that was this successful in 10 out of ten futures markets, even with only a 40% success rate.)
3. Such as system, given enough starting capitol through proper money management in a highly leveraged market, would yield 50% per year. I realize there are far more variables in money management, and I would face large draw downs, but I am just asking about gross concepts. I look forward to your response.

**Re: Survey -How many of you are successful traders?**

Date :10/31/2005 11:18:55 AM Poster : Steve Ward

Each person has to set their own goal, but if those goals aren't realistic, you are going to be throwing away good models. I suggest you set your goals according to what you could make other ways, e.g., investing or emotional trading without analytic models. In 2005 everybody including the so called experts have made less money than they did in highly trending markets or more volatile markets.

I'll just tell you what I look for, and you can take it for what it is worth to your specific circumstance. I like a smoothly rising equity curve with no BIG dips or spikes. It is nice if it made money since 2000, but the biggest test is how did it do in the past year. Almost all of my models made more money sometime during 2000-2004 even out of sample than they have in 2005, so I don't worry that there was a drop in 2005, as long as the model gets a decent return in 2005. I look for a return >20% in 2005 uncompounded.

I don't insist that the model work on every stock because I think that is unrealistic. In fact, I've lately been concentrating on DIA, SPY, and QQQQ, usually trading the emini equivalents. I like those because they are impervious to news affecting one stock or even one sector (usually). I don't even insist that a model make money on all three.

**Re: Survey -How many of you are successful traders?**

Date :10/31/2005 7:30:15 PM Poster : vvv999vvv

Mr. Steve,

I have an interesting question, in your past experience, how much of the future trend deviate from the optimized backtesting.

**Re: Survey - How many of you are successful traders?**

Date :11/2/2005 8:02:38 AM Poster : Steve Ward

A lot. Any time you optimize you take a big chance that the optimizer will do well on the past in spite of weak rules or net inputs. Also the market is constantly changing anyway. Neural nets by themselves aren't bad if you do the right things: keep inputs and hidden neurons low, use as much training data as you can without getting ancient history in, use training data that is evenly bull and bear. When you add optimization either to nets or trading strategies, you have to be even more careful: don't optimize forever (remember the optimizer has rather arbitrary stopping criteria), don't have too many variables that are being optimized (you can limit variables from being optimized), optimize over plenty of past history (until it becomes ancient). Other things you can do include linking parameters in buy/sell rules, optimizing over several chart pages at once, using the Neural Indicators add-on (which are pretty hard to overfit even with optimization) instead of the Prediction Wizard.

Of course, if all of your rules and inputs were great (leading the market), then overfitting wouldn't exist. But given the billions of variables driving markets, that is impossible.

### **Pat on the back**

Date :10/21/2005 2:31:42 PM Poster : Sunny I had a conversation with Steve a couple of weeks ago, and I got the impression from my conversation with him that some of my posts in this forum were creating the impression that I thought that NeuroShell was a bad program. I would like to readdress these issues in this post. First of all, I think that Steve, Mike, Marge, Chris, and other members of Ward Systems are great. Whenever I have had an issue with the use of the program, they have been helpful and understanding of my problems, and they have made themselves available in addressing these issues. Second, I like Neuroshell. I have invested several thousands of hours in learning how to use it correctly. It is not an easy program to master, and it requires patience and work. If I did not believe in the program, I would not even bother in posting in this forum, and I would have already done an emotional and accounting write off for this investment in term of money, time, and effort. On the other hand, I don't detract from my suggestions in improving the program. I want to concentrate in trading not in retraining the nets or in doing things that computers and programs should do by themselves. My suggestions are meant to generate discussion and insight from my personal experience. I was one of the first to suggest, for instance, the use of several parallel processors and 64-bit addressing for Neuroshell, and when these features will be available, they will decrease the amount of retraining, they will increase the amount of memory available to Neuroshell, and they will decrease the time frames available for trading (tick frames anyone). So to summarize, the good people of Ward Systems deserve a pat on the back for their pioneering effort, creativity, persistence, and humanity, and please don't confuse my posts with negativity. As I mentioned before, they are meant with the best of intentions, and if I stepped on someone's toes, then please accept a humble apology. '-'

### **Re: Pat on the back**

Date :10/22/2005 7:23:28 PM Poster : Maciej Sunny, The request for multiple processors, either on the same machine or machines coupled together, has been around for a couple of years least. If my memory serves me right the original Neuroshell had at one time a possibility of running with a special DSP board so the concept of using more than one processor for the cpu intensive tasks is not new and certainly understood by Ward Systems. Hopefully there'll be a day when such a capability will exist.

### **Re: Pat on the back**

Date :10/23/2005 1:54:14 PM Poster : Steve Ward That capability does exist somewhere in release 5.0, as I am sure I have stated before both on this forum and in newsletters.. It is true that rel 5.0 has been a long time coming, but given current sales levels we can only employ so many people doing technical work on this program. If you really want to help, help us increase our sales level so we can employ more programmers. Do that by suggesting on forums etc. that they purchase our software. I have to say it is somewhat rare that we get a purchaser who says "I was recommended by one of your users." I would like to see that change.

### **Re: Pat on the back**

Date :10/23/2005 3:13:02 PM Poster : vvv999vvv Steve, In my personal opinion,

this is a good program for quality users, but it is not that easy to learn and understand for most of the users. Take me as an example, I brought 3 add-ons, in order to understand stand how to use the cybernetics, I need to read the book again and again before I can establish a trade system. I can never apply the turning point successfully on trading system, and worst is the neuro indicator, it make me completely lost on what I am doing and it is too lengthy to do the optimization on strategy (4 days or more) on my pc with Xeon and 2G ram, or 2 days to re-train my trading startegy with less than 5 indicators on 3 months 60 min chart and 3 weeks on 15 min chart, I admit that t here are many indicators included in the program, I wonder how many of them can understand and use by your customers, I think this is one the reasons why the sales are limited. May I suggest that put this forum into an open forum, so other quality users can learn what neuroshell can do and make them an alternative choice.

**Re: Pat on the back**

Date :10/23/2005 2:35:30 PM Poster : vvv999vvv Maciej, Mind to tell more on the DSP board and machines couple together in order to improve the performance, if I run two optimization at the same time, it occupies me 100% cpu usage. Also, what you think about the 2 core processors?

**Re: Pat on the back**

Date :10/24/2005 11:49:18 AM Poster : Maciej I think Steve has replied already on the multiple processor. As I stated, the DSP was a long time ago for Neuroshell not for NSDT and at that time the processors were indeed vey weak. Currently when I run NSDT on a dual processor only one is used by NSDT so having two seems of limited use. Steve explained that rel 5.0 should have this multiple cpu feature. Effectively, as you explain, if you run two instances at the same time each can use a separate processor. That however does not get round the problem of shortening the time to optimize.

Overall I tend to agree more and more with remarks by others (Mark Simpson in another thread) that if you spend too much time optimizing yo're probably barking up the wrong tree.

**Re: Pat on the back**

Date :10/24/2005 3:36:04 PM Poster : vvv999vvv Maciej, Thank you for your reply, The training results seems attractive (more than 5000% On 1 % margin), the lengthy time might be arised from the nature of the forex trade. Good luck

**Re: Pat on the back**

Date :10/23/2005 1:44:09 PM Poster : Stve Ward It was not that I thought you didn't like the program, it was that I thought you were unsuccessful, and you assured me you were not. I do not feel suggestions imply dissatisfaction with the program. In fact, most of what is in release 5.0 are suggestions from users. However, if we aren't moving fast enough, I would recommend that you and other users with suggestions help us by making sure we have resources to hire more personnel. After all, your original purchases several years ago do not help us now. You can help us by spreading the

word about NeuroShell, and voting for us in the Technical Analysis of Stocks and Commodities competition. Prospective users heed more what old users say than they heed anything that Ward Systems says. So help us help you.

**Suggestion for release 5 - max drawdown %**

Date :10/24/2005 12:01:04 AM Poster : Jerry Wagner

Steve Please include max drawdown expressed as a percentage. I run many long term research tests and the dollar drawdown is meaningless. Thanks

**Re: Suggestion for release 5 - max drawdown %**

Date :10/24/2005 10:03:25 PM Poster : Steve Eberbach

Too bad I can't "go back" to read your name. But this tip may help:

I get around the stops-by-percent-returns problem by converting my prices to "log-delta" format: Value= Accumulate(100 \* (ln (PriceThisBar)- ln(priceLastBar))). This works well for me because my trading strategy is based on setting stops ( stop order and limit order) optimized by the genetic algorithm optimised on "return", not optimised price crossing "signals" to execute at market price. That way, I can set my orders in place longer before they are executed, and not be tempted to chase sudden moves when its too late, and benefit by the random fluctuations above and below the trends, with "automatic execution" at more advantageous moments when the market is more liquid. This "log-delta" view of returns translates price movements into percent changes such that doubling is "+100%" and halving is "-100%". It is different in that losses are treated same as gains, compared to the usual definition of percent change. If you double, its 100 points, and if you go back where you were before, you lose 100 points. It's percent relative to where you were on average the last two time points, not just where you are now. That way your stops expressed in terms of value are REVERSIBLY normalized to returns, both positive and negative. Otherwise you introduce an incorrect "bias" with increasing fluctuations even with longer term average price constant! Also, it helps when you are trying to compare one trading instrument to another by return on investment. If you used stops based on the usual "percent change" definition you could get messed up by more meaninglessness than with dollar based stops.

Alternatively, you could simply express your prices in any logarithmic format you choose. So my suggestion would be (for version 5) to have instant conversion to the logarithmic format that is representative of percent return built right into the program numerics and its charts: PRICE (dollar) format, and RETURN (unbiased percent-delta points) format. The only parameters needed would be starting (or ending) "points", and starting (or ending) time. From there, all trading instruments can be compared "apples-to-apples".

Steve Eberbach

**Re: Suggestion for release 5 - max drawdown %**

Date :10/25/2005 3:43:40 PM Poster : Steve Ward Rel 5.0 is already programmed and being tested as we speak, so it is really too late for enhancements (we're just fixing bugs now). But both of these suggestions are excellent, and they will be on our 5.1 or 5.2 list of prospective enhancements.



**How does AdaptiveTurboprop2 retrain?**

Date :10/24/2005 5:49:05 PM Poster : MFK A question on day-to-day functioning of AdaptiveTurboprop2: After initial optimization, when a net retrains, does it retrain all elements specified at setup (i.e., trainbars, aheadbars, hiddens, parameters for input indicators, etc.) or does it just retrain its internal weightings of parameters specified during original optimization? Thanks.

**Re: How does AdaptiveTurboprop2 retrain?**

Date :10/26/2005 2:45:09 PM Poster : Ward.net Webmaster AT2 only retrains weights. The other things you mentioned (trainbars, aheadbars, etc) are parameters for the training process itself, and they can only be changed by either you or the optimizer. The optimizer will only change them if you reoptimize. Once optimized, the net retrains itself every N bars using the parameters the optimizer found.

**Cybernetic Analysis Add-on Package**

Date :11/20/2005 3:19:15 PM Poster : Bob Swihart Marge, I enjoyed John Ehlers article, "Fractal Adaptive Moving Averages", in the October 2005 issue in the Technical Analysis of Stocks and Commodities Magazine. I decided to purchase John Ehlers, Cybernetic Analysis Add-on Package, from Ward Systems Group. I am very pleased with the Cybernetic Analysis because it definately helped me with my trading. Now that I have used the package for some time, I think that anyone using Neuroshell Systems, should consider the Cybernetic Analysis Add-on Package. I understand that Ward Systems will be selling John Ehlers Mesa Software add-on software in 2006. I am looking forward to using this system if it is anything as good as the Cybernetic Analysis add-on. Sincerely, Bob Swihart

**Re: Cybernetic Analysis Add-on Package**

Date :12/7/2005 6:25:54 AM Poster : vvv999vvv In Cybernetics add-on, I have a little problem and hope to hear from you all For Fisher transformation, the value should be between -1 and 1, why in the add-on, there have value up to 5 ocassionally? TIA

**Re: Cybernetic Analysis Add-on Package**

Date :12/7/2005 8:46:13 AM Poster : Ward.net Webmaster Why do you think the value should be between -1 and 1?

### **Kurtosis and skewness**

Date :11/29/2005 7:39:51 AM Poster : Sunny I have been working lately with kurtosis and skewness. Several different papers that I found suggest that these statistical tools could help to determine change in direction for time series of prices. I was wondering if anyone here has indicators for these two measures. Regards, Sunny

### **Re: Kurtosis and skewness**

Date :11/30/2005 4:15:41 AM Poster : Phil Greenwood Sunny, These are interesting measures - there is a compact discussion of calculating these numbers in Mathematics of Options Trading by C B Reehl - pp286-288. (I note that there is a citation in this book to Sheldon Natenburg). It appears that these calculations are pretty straightforward. I presume you are wishing to compare short term skews and kurtosis to long term skews and kurtosis (or perhaps-erroneously-normal distribution)? If so, there may be some simple proxy approaches: A skew is going to appear when the market has been trending in a direction (in which case you will see a divergence of mean and median calculations). A sample with high kurtosis is likely to have elements of congestion and trending in it as opposed to one or the other; the diversity would account for the "fat tails" of high kurtosis. However, perhaps you are considering your market's skewness and kurtosis with respect to the overall trading strategy? It seems to me that, in theory, using the GA to optimize over a sufficiently long sample period should take these effects into account..that is the large infrequent events should be factored into the data. The problem is what is a sufficiently long sample period? How many of these events need to be included? Hope this is useful. Phil

### **Re: Kurtosis and skewness**

Date :12/1/2005 6:06:55 AM Poster : Sunny Phil, I am actually trying to go the way that Mark Simpson has suggested. If I understand his approach, this means to predict without optimizing. My understanding of the optimization process is that we are doing the "best" curve fit possible with the indicator at hand. The approach I am trying to follow is to predict by training NS to find patterns. However, I am doing my best to avoid optimizing. It is a difficult trade off since my best results occur when I optimize, but my level of confidence is lower when I optimize. Several interesting articles in the net suggest that these statistical measures when combined with other approaches appear to yield interesting results. In particular, look for articles from the Federal Reserve and from Cornell Univeristy. A simple but untested approach is to look at the sign of kurtosis. If the sign is negative, and the sign of skewness is negative, then this would imply that prices will now go lower. On the other hand if kurtosis is negative and skewness is positive, then this could suggest that prices are going higher. However, I have been unable yet to test these ideas in NS. Moreover, I do not think that these measures will suffice by themselves in accomplishing predictability. They would be part of a more comprehensive arsenal of tools. In addition, I think that several different time frames should be explored to confirm direction. Regards, Sunny

### **Re: Kurtosis and skewness**

Date :12/1/2005 12:30:53 PM Poster : Mark Simpson

>I am actually trying to go the way that Mark Simpson has >suggested. If I

understand his approach, this means to predict >without optimizing.

Hi,

Just to clarify, I'm not suggesting that you don't optimize completely, what I'm saying is.

1. With a regular approach, optimization should be the last thing, i.e. build a model that works then optimize it to improve results, don't optimize to build a working model unless you have enough data to validate your model, and the data you're modeling isn't changing fundamentally over time. OR
2. Use a piecewise linear approach to a model, i.e. keep Degrees Of Freedom low, and optimize frequently.

Mark Simpson Bowfort Technologies Inc.

**Re: Kurtosis and skewness**

Date :12/4/2005 4:18:59 AM Poster : Sunny

Mark,

Thank you for setting me on the right path again.

As I said, I was not sure if I was understanding your approach correctly.

My understanding of the optimization process is that we are obtaining the "best" fit of something around a curve; however, I am always suspect that the future will bring some slow or fast curves that have not been seen in the past, and the optimization will fail to deal correctly with these.

For this reason, I thought that the approach of predicting patterns seemed more robust to me rather than to attempt to obtain a "best" fit for a curve by optimizing.

When you refer to "...a piecewise linear approach to a model...", are you thinking of having several different copies of the same prediction in which the maximum and minimum training set sizes vary.

For instance, I could have one copy of a prediction with a maximum of 6 years and a minimum of 4 years, and then I could have a second copy of the same prediction with a maximum of four years and a minimum of two years, and finally, I could have a third copy of the same prediction with a maximum of two years a minimum of one year. Finally, you would enter the results into a trading strategy, and you would allow the trading strategy to sort the results out.

By the way have you had any luck using kurtosis nad skewness?

Regards,

Sunny

**Re: Kurtosis and skewness**

Date :12/4/2005 6:12:17 PM Poster : Mark Simpson

>My understanding of the optimization process is that we are obtaining the "best" >fit of something around a curve; however, I am always suspect that the future >will bring some slow or fast curves that have not been seen in the past, and >the optimization will fail to deal correctly with these. That is always the

danger. Which is why it necessary to keep an out of sample set seperately to test on, or to paper trade the model.

To me, I don't see fast and slow curves, I see either data that hasn't been accurately modelled with a big enough sample set for the Degrees Of Freedom of the model, or I see an adaptive process in play that isn't being accurately modelled.

Essentially the optimizers job is to find the best fit. That's it goal, and it does a fine job of achivieing it. However there is no guarantee that the best fit is the best fit for the model as a whole.

For instance, if we toss a coin twice and we get tails both times, then you could build a perfect predictor that says, everytime we toss a coin we get tails. However we'd be wrong, because we modelled our results with total disregard to the model. (Not that I'm suggesting we model a random process :-)

>When you refer to "...a piecewise linear approach to a model...", are you  
>thinking of having several different copies of the same prediction in which  
>the maximum and minimum training set sizes vary. I'm talking about  
optimizing frequently, but it only works when the degrees of freedom are small. I've posted quite extensively on this a few months ago, please check these out on the forum as they have diagrams explaining the proccess. Feel free to ask questions if they don't address what you need to know.

>By the way have you had any luck using kurtosis nad skewness? This comes into the probability type of indicators mentioned earlier. Stocks returns aren't normally distributed, so technically assuming normality (as kurtosis and skewness, standard deviation do) could be considered a mistake. However at some level if you're measuring the extremeness of something, it's a reasonable approximation. I.E. You could say that if you had an event that was way outside the norm, that it is meaningful.

Other approaches can also be the fisher transform or even the log normal distribution approach.

The probability approach works, provided you pick events that are extreme enough. However the catch is that these events are rare, so you're out of the market a lot of the time. The more extreme the event, the more likely that you will get a reversal.

Mark Simpson Bowfort Technologies Inc.

### **Re: Kurtosis and skewness**

Date :12/6/2005 9:20:43 AM Poster : Sunny

Mark,

"I'm talking about optimizing frequently, but it only works when the degrees of freedom are small."

If I have both a prediction and a trading strategy, once I have optimized both one time, then should I then optimize the next time from scratch or is optimization done using the last optimal settings?

"Stocks returns aren't normally distributed, so technically assuming normality (as kurtosis and skewness, standard

deviation do) could be considered a mistake. However at some level if you're measuring the extremeness of something, it's a reasonable approximation. I.E. You could say that if you had an event that was way outside the norm, that it is meaningful."

Have you done actual experiments using kurtosis and skewness?

"Other approaches can also be the fisher transform or even the log normal distribution approach."

My understanding of the fisher transform is that it is not suitable for non-stationary signals.

Regards,

Sunny

**Re: Kurtosis and skewness**

Date :12/6/2005 3:35:32 PM Poster : Mark Simpson

>"I'm talking about optimizing frequently, but it only works when the degrees of >freedom are small."

>If I have both a prediction and a trading strategy, once I have optimized both one > time, then should I then optimize the next time from scratch or is optimization > done using the last optimal settings? Personally I optimize from scratch, that way I know I'm always at the same starting point. However if you know that things haven't changed substantially, then optimizing from the last optimal settings will work fine too. But remember to specify the optimization length.

I.E. If you optimized yesterday and were optimizing over a window of 3 days, then the window would start from 3 days before yesterday. When you then re-optimize today, the window starts from 3 days before today etc.

> Have you done actual experiments using kurtosis and skewness? Yes. Any biases tend to be transient in nature and identifiable by other means too. However I recommend you go ahead and investigate it anyway, it helps with understanding probability type indicators. But make sure those percentages deltas are logged (see earlier post), otherwise your results will be distorted.

> My understanding of the fisher transform is that it is not suitable for > non-stationary signals. I consider all of these approaches as less than ideal for non-stationary or infact anything other than a regular distribution. They are an approximation. Approximations can have a place however.

Ehlers Cybernetic Analysis For Stocks and Futures contains a good description of the Fisher Transform in Chapter 1.

Another way to improve the quality of results is to remove some of the non-stationarity before the analysis.

Mark Simpson Bowfort Technologies Inc.

### **The limitations of the eyeball test**

Date :11/30/2005 4:35:59 AM Poster : Phil Greenwood

I had an insight that I wanted to share with the community here. I was reading Nassim Nicholas Taleb's book "Fooled By Randomness", pp95-97 "Bull and Bear Zoology", when I realized that there was a limitation in my intuition of how I was viewing trade indications...perhaps a few other people are struggling under this blind spot.

My simplistic approach has been that my systems should be capturing the meat of the moves. If the market went up, I should be long, or down, I should be short. Naturally this is ideal.

However, the trade signals that we identify when we optimize are something different; they are simply based on \*expectation\* -the aggregate product of the probabilities of outcomes and the value of those outcomes at any given point in time. And all of this is laboring under the twin interrelated assumptions that the indicators involved are meaningful, and that they will behave in the future as they did in the past as predictors of price action.

For example if, before our exit is triggered, there is a 30% chance of a 10% rise, and a 70% chance of a 2% fall we should be long! Even though the market is more likely to fall!

I know this is not simple; perhaps you're not making the same mistake, but then again, maybe you are? This is surely a limitation of eyeballing the strategy - in the chart you see the outcomes, not the probabilities or expectations.

Phil

**On Trusting Models...**

Date :12/19/2005 8:15:50 AM Poster : Dan Melton A question for any who would like to offer insight: At what point do you begin trusting your models enough to trade with them (i.e. what does a good checklist look like to you)? Thanks for your thoughts-Dan Melton

**Re: On Trusting Models...**

Date :1/3/2006 6:04:28 PM Poster : John Coleman Some successful forward tests, and have a look at your accounts equity curve. You want it to be a smooth progressive increase if possible, and it should not mirror the equity curve of the security. There are some useful stats that NST could/should include in its analysis to help with this IMHO.  
John



### **One of my models**

Date :12/23/2005 8:49:50 AM Poster : Steve Ward There was a recent thread where people were asking what is a good model. I think I told someone they were expecting way too much for 2005 - which has been a really hard year. So I've put the performance results of one of my models on the web so you can see what I think is pretty good out of sample for this year. I'm actually thinking of selling signals made by it to anyone who either doesn't have NeuroShell or wants some decent signals while they are perfecting their own better models. Let me know what you think - we can discuss how good is good again if you want.

[www.wardsystems.org/markettilt](http://www.wardsystems.org/markettilt)

You'll need Internet Explorer, Firefox won't read PowerPoint slides. You can phone me about this model, email me, or post here on the forum.

### **Re: One of my models**

Date :1/5/2006 7:12:53 AM Poster : Dan Melton Steve, I think this is impressive, given that the signals are out of sample and the basket of stocks is so broad. Dan Melton

### **Re: One of my models**

Date :1/5/2006 12:36:52 PM Poster : Steve Ward The interesting part is it is exactly the same signal for all the stocks. It seems if you can get SPY right, you get many of the large caps right at the same time. If you want to download a chart and try the 2005 signals on your own stock picks, go to [wardsystems.org](http://wardsystems.org)

### **Re: One of my models**

Date :1/12/2006 6:06:41 PM Poster : John Coleman I am trying to develop for the FDAX. It doesn't always follow SPY so well, have you tried it? 2004 seems worse (low volatility) than 2005 for FDAX. What is the link to download the NST chart please? regards, John

### **Re: One of my models**

Date :1/13/2006 7:58:03 AM Poster : Steve Ward

I haven't tried FDAX on our model. Go to [www.wardsystems.org](http://www.wardsystems.org) to download the chart and the 2005 signals. You'll see the link there. Just add/remove chart pages, take out SPY, and put in FDAX.

### **Re: One of my models**

Date :1/13/2006 11:58:53 PM Poster : vvv999vvv\_88

May I ask is the signal applied to forex as well?

**Re: One of my models**

Date :1/14/2006 1:07:00 PM Poster : Ward.net Webmaster

The model has never been attempted on FOREX. We doubt it will work on that.

**Re: One of my models**

Date :1/15/2006 6:51:34 AM Poster : Sunny

Steve,

You are selling signals with a ratio of gross profit / gross loss  $< 2.5$  and a ratio of average winners to average losers  $< 2$ . You are basing your signals based on the equity (return on trades  $> 15\%$ ); however, what about the risk/reward ratio?

A ratio of average winners to average losers less than 2 means that you have a very small margin of error. If one of your winners turns to be a loser, then you will have to try to make up for it in the next series of wins, but this already assumes that the next series of trades will be winners. What

happens if they are not winners? You have to make more trades to try to make up for your losers.

Moreover, in your stats for the dow 30 you have a % of profitable trades between 48 - 71%. This means flipping a coin would have done just as well with many of these trades --50% profitable trades.

Some of your sectors such as utilities have this ratio at less than one. This means that the utility sector would lose more than they win. I would guess that the consecutive losers statistics would be greater than one. This would mean that you would have more than one consecutive loser. In my humble opinion your system sounds kind of risky. If market conditions turn against you, will your system be able to compensate quickly for this? Have you included already money management of your trades into your system, or are these raw signals? Are you basing your signals based only on price and volume, or are you doing an inter- or intramarket model which takes other variables into account? For instance, are you including stock markets in other countries, interest rates, commodity prices, etc.? Some people will accept these kinds of ratios; however, I would not trade them since the risk/reward ratio is not skewed in my favor. The whole point of trading short term is to have the cards stacked in my favor. I am sorry, but I expected more from you. Regards,

Sunny

**Re: One of my models**

Date :1/15/2006 10:12:10 AM Poster : Steve Ward

No, Sunny, flipping a coin would not have produced these trades. Remember, I didn't do this model in hindsight, i.e., keeping the one that worked best in 2005. The model was trained once and hasn't been changed since May. Also, please read carefully - it is a SPY model that

made almost 30% but whose signals happen to have general ability on the overall market. The signals aren't supposed to do great on every sector or every stock.

But I don't claim to be the best, and yes trading is risky. This model could fail. I am hoping you indeed have a better model, and are not just suffering from unrealistic expectations for 2005. I posted my model in the first place to fight the tendency people

have to think this is still the nineties.

**Re: One of my models**

Date :1/16/2006 8:48:10 AM Poster : chris wong

sunny didn't understand the powerpoint. is there any possibility you can train your net for nasdaq, dax, ftse and other major world indexes? switching money between them with these signals could be a great strategy

**Re: One of my models**

Date :1/15/2006 3:59:33 PM Poster : Maxwell Craven

I've long believed that applying litmus tests to statistics is bad practice. Having said that, it doesn't look like you loaded the chart and applied to SPY, Sunny. It shows a return of 30.3%, with a gross profit/loss ratio of 2.86, and 62.8% profitable trades. Max drawdown is only \$522,

and open trade drawdown of only \$233. I don't know about you, but I have no chart that good, unless I train or optimize on 2005, which Steve says he didn't do.

### **Writing an NN**

Date :1/7/2006 11:25:40 AM Poster : John Takacs I have an idea for an NN that has nothing to do with a trading system or an indicator. It is an exit strategy type of idea. It could be more than that but here goes the description: 1) Pick your most important period moving average. The one that seems to best indicate the overall trend of your market of choice on a 5 minute bar. So, for example, let's say you like the 47 period MA. 2) If prices are beneath the 47 period MA (having tanked earlier) and are coming back to approach the 47 period MA from the bottom, perhaps over 3 - 6 bars, then you want to predict the likelihood of prices stopping at the 47 period MA and being a percentage below the 47 period MA in the next X number of bars vs continuing on through the 47 period MA, and being a percentage above the 47 period MA. Bottom line, in the above example, knowing that prices for the current situation are going to stop at the 47 period MA would give you a edge to continue or initiate an additional short trade. John

### **Re: Writing an NN**

Date :1/8/2006 8:31:42 AM Poster : Matt Jarvis Thats not a bad idea. I'd suggest using the spread between the price and the moving average, or the rate of change of the spread, maybe feeding those both into recur2 or recur2c.

### **Targets question**

Date :1/25/2006 1:42:21 PM Poster : Manny L.

I almost always find that my best out of sample returns using the Prediction Wizard in NST come from using a short lookahead (1 day usually) on percent change in open. It has always seemed to me that such a noisy target function makes the NN's job of getting good correlation with it near impossible. Yet, when I try smoother targets that inherently have better correlation with the inputs, the returns are not as good even though the out of sample signal correlates much better with the target. Is there an explanation for this behavior and is there an optimal way to develop target functions based on a given input set? Anybody else notice this? Any thoughts on the subject would be much appreciated.

### **Re: Targets question**

Date :1/27/2006 3:08:46 PM Poster : Steve Eberbach Manny:

When you smooth your target, you will be adding a delay unless you compensate for it. A smooth moving average pushed ahead one bar is mostly made up of the past data. You would, for example, need to set the delay of a 3-bar moving average from 1 bar past (natural delay lagging) to one (or more) bar future (leading) in order to get an apples/apples comparison with your one bar future (leading) percent change target. That would be using at least 2 bar lookahead for a three bar moving average to get a "real" one bar lookahead.