PRODUCT REVIEW

NeuroShell Trader 6

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Email: sales@wardsystems.com;
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Product: Neural network trading software
Requirements: Pentium (or equivalent) 2.4 GHz, 3 GB RAM, Windows 7/XP/Vista (32 or 64 bit)
Price: Prices start at $1,495 for NeuroShell Trader Professional, and go to $3,495 for NeuroShell DayTrader Power User. Numerous plugins are available starting at $299 each.

by Dennis D. Peterson

N euroShell Trader (NT) is highly sophisticated software that is much more than just a way to utilize neural nets. NeuroShell Trader also deserves to be recognized for having well-designed interfaces that let the trader explore ideas with ease and speed. You can create trading strategies without doing any programming, or you can ask NeuroShell Trader to optimize over a range of parameters and do it in a minute or so. This newest version adds two new features that current users and traders in general have been looking for: position sizing and pyramiding. Thus, the ability to optimize over a range of parameters in a short amount of time is especially helpful when position and pyramid sizes are added to the list of items to be optimized.

THE WIZARDS

Two interfaces within NT are the Prediction Wizard and the Trading Strategy Wizard. For each you'll go through a series of screens, some of which you'll need to make a choice about before going to the next screen, but there will be others where you'll probably use the defaults. Navigating has a couple of common threads for either wizard, as illustrated in Figure 1. Not only are they the same size, but the button locations at the bottom are the same for both. The only difference in the button labeling is that one button reads "Modify Prediction Parameters," while the other one reads "Modify Strategy Parameters." If you need an indicator(s), you'll deal with the same Indicator Wizard, whether you are building a trading strategy, prediction, or indicator. Thus, there are three wizards: indicator, prediction, and trading strategy, and the wizards sometimes share similar screen formats to ease learning.

To understand how the wizards work together, let's build a trading strategy, and along the way we can see how easy it is to add position sizing and pyramiding.

A trading strategy consists of one or more trading rules. A trading rule is a statement that is either true or false for a trading action. Examples of trading actions are buy (long), sell, short, and buy to cover. A rule we could make that would incorporate a Prediction Wizard result would be: Buy if the predicted open is greater than a threshold five days in the future. This last statement is a result of an output from the Prediction Wizard

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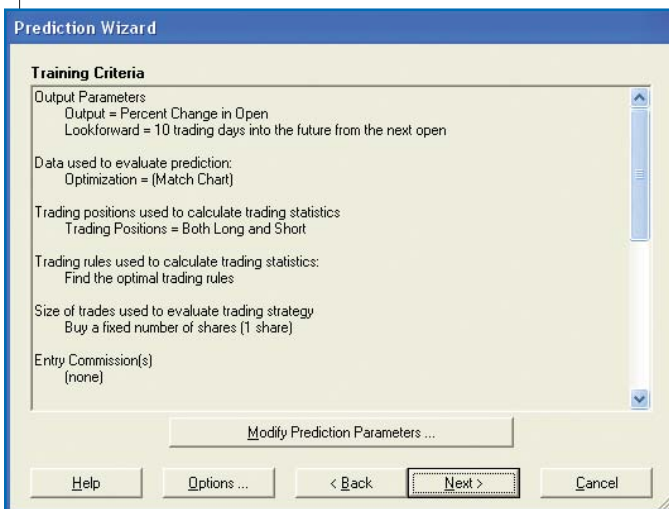

FIGURE 1: PREDICTION AND STRATEGY WIZARDS. Some of the screens used by the wizard interfaces are nearly identical, making learning less of a chore. Here, on the left is one of the screens used by the Prediction Wizard, while on the right is a screen used by the Trading Strategy Wizard. The button formatting at the bottom of either screen is similar for most interfaces.
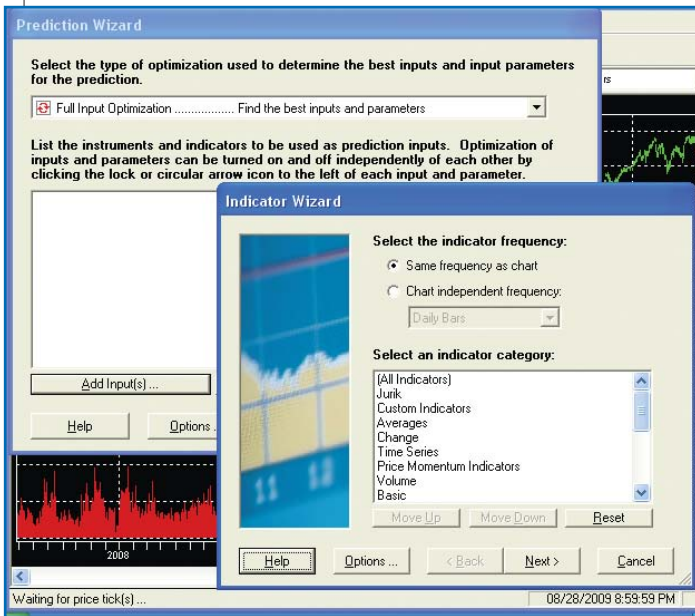
FIGURE 2: PREDICTION AND INDICATOR WIZARD SCREENS. The underlying price chart has been overlaid initially with a Prediction Wizard screen (upper left) and then with the Indicator Wizard screen (lower right). You can access the Indicator Wizard by selecting "Add Inputs" (lower left of Prediction Wizard) or simply by selecting "Insert" on the menu line and then selecting "Indicators." The scroll bar in the Indicator Wizard window is at the top, indicating that you are viewing a portion of the categories. There are 51 categories with more than 800 items.
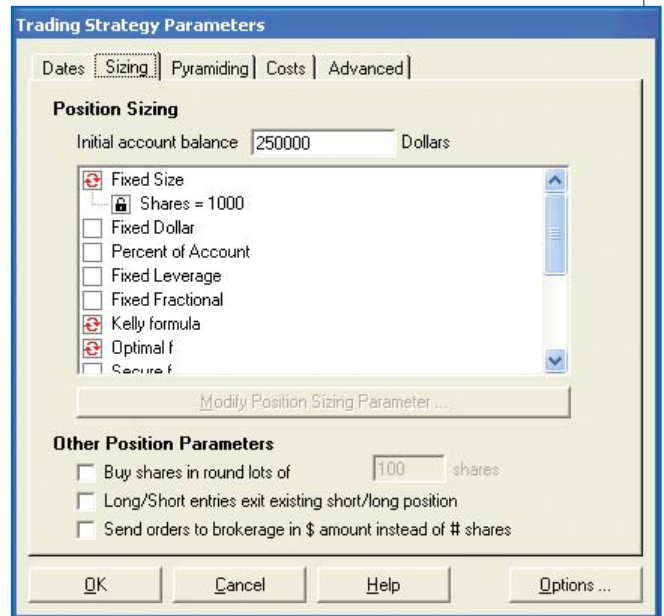

FIGURE 3: POSITION SIZING CHOICES. Over a dozen choices are available and the user can select more than one, since the optimizer will pick the best one. To the left of each choice is a blank square that gets filled in with a red activation icon when you click on the square. For the trading strategy being constructed for this review, "fixed size," "Kelly formula," and "optimal f" have been chosen.

that reads "Pred>Long Entry Threshold: Predicted 5 Bar % Change In Open."

INDICATOR BUILDER

As mentioned earlier, NT is designed for ease of use. In keeping with this, all of the following steps are accomplished by pointing and left-clicking with your mouse button. After you open a chart (multiple datafeeds are supported), choose the insert option from the menu line and insert a New Prediction. After choosing "No Template," you arrive at a screen (Figure 2: upper right-hand screen in background) that wants you to choose an optimization technique and add inputs. Clicking on "Add Inputs" results in an Indicator Wizard screen (Figure 2), where you have 51 categories to choose from, such as custom indicators, averages, change, and price momentum indicators. Within the 51 categories are more than 800 items, many of which are indicators. The custom indicator category is for user-built indicators, while plugins such as Jurik indicators are at the top.

One of the categories in the Indicator Wizard is "Relational." Within this category you find a large list of items such as "A < B < C (A<B<C)," as well as the two we will use to build our trading system, namely "A < B (A<B)" and "A > B (A>B)." We'll build a custom indicator called the double-weighted moving average, using a linear-weighted moving average and Jurik moving average (JMA) for the A and B parts of our two relations. Again, all of this is done with just pointing and clicking. Along the way, we are going to add into the mix our choice of position sizing, where we have several choices (Figure 3).

You can select just one method for determining the size of your position or several, as is the case with Figure 3. The optimizer will choose the one that works the best. Using the "Pyramiding" tab, you can specify how you want to increase your position.

TRADING STRATEGY BUILDING

When you construct your own trading strategy and you want to increase your position with pyramiding, then you must be conscious of the fact you don't want the cross above or below constructs, but relational constructs A>B and A<B. The reason is that a cross is a single event, and as soon as it happens, it is not true

on the next bar.

To pyramid your position, you want follow-on prices, meaning the next bar, that keep the relationship true, as in the case of either A<B or A>B. Note that there are two trading systems in Figure 4. The first uses the crossover construct, while the second one uses the relational construct. The relational construct, rather than the crossover construct, generated significant profit. You can see the trading system later on.

CHARTING

NeuroShell Trader offers several pre-canned formats for price charts, and the one chosen here is price with volume data (Figure 4). The default black background is easy on the eyes, but like all high-end trading platforms, you can change the color and numerous other attributes of the chart. After you have a price chart, you can insert some trading strategy results in a subchart. If you create more than one trading strategy, you'll have multiple subcharts, as is the case in Figure 4, since we created two trading strategies.

Each subchart shows where trades are entered and exited, as well as the number of shares that are bought or
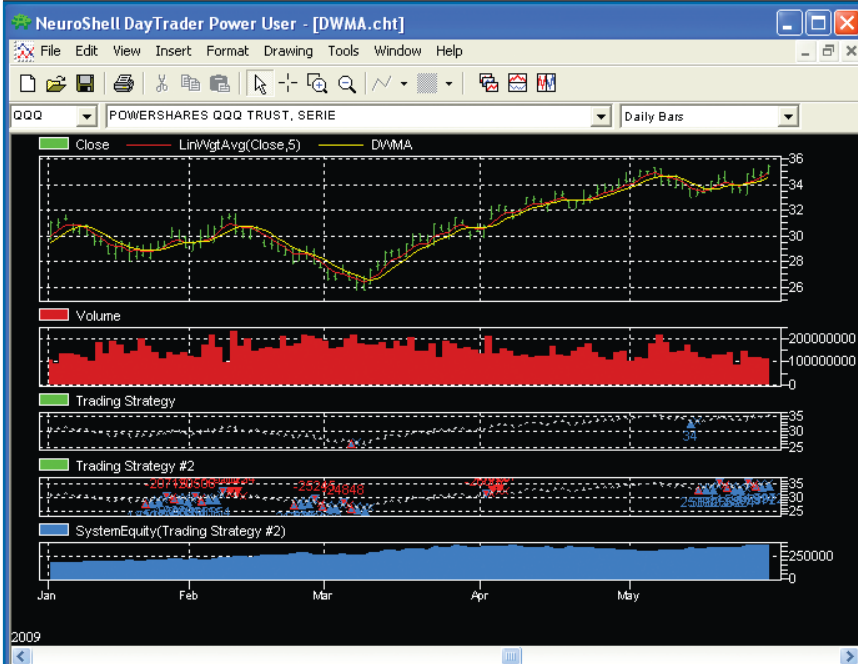
FIGURE 4: PRICE OF DAILY QQQ. The top chart, daily OHLC price bars, has a double-weighted moving average (DWMA) in yellow, overlaid with a Jurik moving average (JMA) in green. The subcharts are volume, a trading strategy using crossover constructs, a trading strategy using relational constructs (labeled as Trading Strategy 2), and at the bottom the equity curve for Trading Strategy 2.

FIGURE 5: DAILY QQQ OVERLAID WITH WEEKLY LINEAR MOVING AVERAGE. Green OHLC bars are overlaid with a red weekly moving average. NeuroShell Trader gives you the option when you enter the Indicator Wizard to choose "Chart Independent Frequency" (Figure 2, upper portion of Indicator Wizard screen).

shorted. Using the Indicator Wizard, you can choose from several types of equity curves (over 30) from the Trading Strategy System Information category, and the bottom subchart "System Equity: All Trades (System Equity)" is one of those choices.

Examining the two subcharts — Trading Strategy and Trading Strategy 2 — you can see that Trading Strategy 2 has many more trades, as evidenced by a large number of colored triangles, each indicating a trade. If we were to magnify the chart, you would see that the number of trades can also be seen.

An outstanding feature of NT is that you can also create a subchart that has a different time frame — that is, even though the price chart is daily, as well as all the subcharts shown in Figure 4, you could have a weekly subchart of whatever you want. You can drag the subchart up to the price chart and overlay it. This is exactly what was done to create Figure 5. A weekly linear-weighted moving average was inserted and can be seen on the price chart as a separate subchart. It was then dragged up to the daily chart and the result is a series of steps, since the value of a weekly chart will be constant for a week. In fact, your access to modify is slick as well. Double-click on a legend, or legend element, and you can go back (using the back button — see Figure 1) and modify whatever you want — in other words, you can start all over again.

TRADING STRATEGY WITH CUSTOM INDICATOR

In a review of Jurik Tools in the April 2009 STOCKS & COMMODITIES, I used the crossover of a double-weighted moving average (DWMA) with a Jurik moving average to demonstrate a profitable trading strategy. As it turns out, some of the Jurik tools are also available on NT as a plugin. NT has the ability to create custom indicators, so again, just using mouse-clicks, I recreated the DWMA as a custom indicator. A DWMA uses the construct:

$$value1 = waverage(\ series,\ length),$$
$$DWMA = waverage(\ value1,\ length),$$

and for the waverage (weighted moving average), I used the linear-weighted moving average. In other words, a DWMA is the weighted moving average of a weighted moving average. With this kind of ultra-smooth average, it is natural to use a Jurik moving average (JMA), which is a faster-moving, very low lag, moving average. The beauty of all of this? If you are not sure what length you want to pick, don't worry, as NT will optimize that aspect as well as what position sizing system works best, as well as just anything you can think of, *and* do it in just a couple of minutes. The result is somewhat spectacular, as can be seen in Figure 6.

This is a feature that I have never seen on any other product, and that is the ability to give you feedback on what

trading rules worked best. In this case, we only had one rule for long entry: Is JMA>DWMA? Similarly, we had only one rule for short entry: Is JMA<DWMA? Had we had a number of rules for entry, NT would have told us which one(s) worked best.

In this case, we had three different position sizing rules, and as you can see from Figure 7, the Kelly formula was the positioning rule that gives the best result. Had we created a neural net to provide a prediction, we would have been shown the contribution factors for each input to the neural net. Thus, you can find out quickly which inputs really matter — that is, which ones have the greatest weight for prediction. You can then use that neural net as one of the rules for a trading strategy.

SUPPORT
Support is available by phone and everyone is knowledgeable. The company is based in Maryland and they are available from 9:00 am to 5:00 pm Eastern time (ET) Monday through Thursday, and till 4:00 pm ET on Friday. They have made a bunch of videos, and there is help tailored for the mode you might be in. If you are in the Indicator Wizard and you are not sure what a particular indicator does, you have the option of choosing "Indicator Help." In short, support is superb.

A number of datafeeds are supported such as DTN IQ, eSignal, and Interactive Brokers, as well as MetaStock-formatted data, to name just a few.

SUMMARY
I could go on for several more pages, as there is that much to NeuroShell Trader. Setting up a neural net has the same kind of point-click interface that you see for building a trading strategy. It's just a matter of selecting inputs, and you can pick a bunch, since NT has several strategies for finding the optimal solution, including "exhaustive" if you can leave your computer for a while.

The output questions are how far into the future do you want to go and what you want to predict. The versatility of NeuroShell Trader can be seen in the developer's ability to use a neural net as one of the rules for a trading strategy.
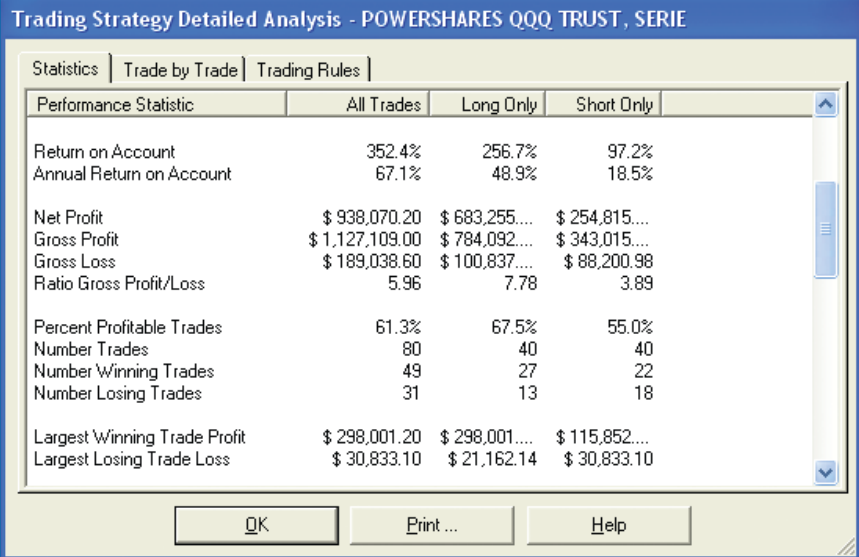

FIGURE 6: TRADING RESULTS. For any trading strategy, you can see the results of your trades in a summary form as shown here, or you can use the "Trade by Trade" tab to see individual trades. Especially helpful are the results shown under the "Trading Rules" tab as seen in Figure 7.
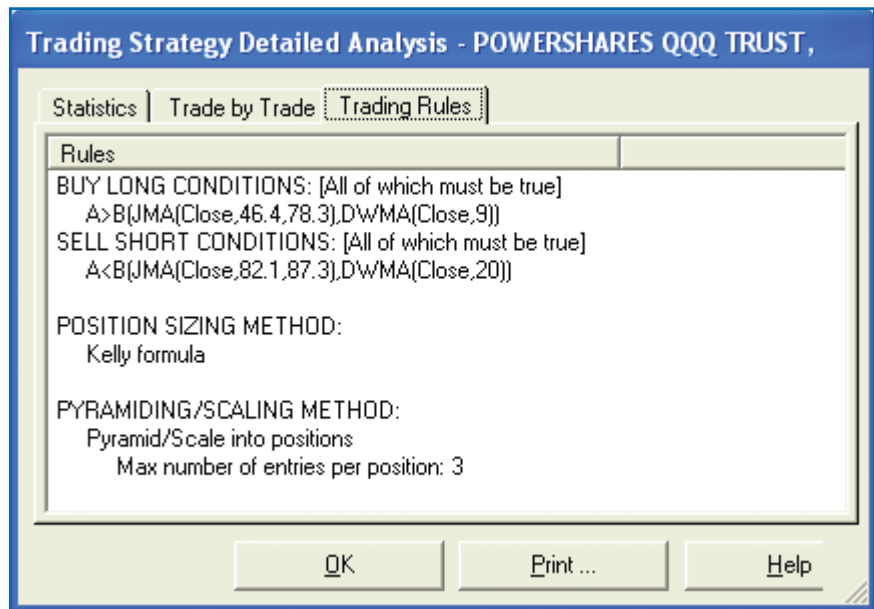

FIGURE 7: TRADING RULES. The long entry rule used is shown, but note the optimized parameters for each of JMA and DWMA. Had there been several trading rules for short and/or long entry, you would see the one that worked best for short and long entries. For position sizing, there were three rules and the one that the optimization liked best was the Kelly formula.

Even if you just use the trading strategy side of NT, you can optimize around a range of parameters, such as trading rules, position sizing techniques, and pyramiding, and do it all in just a few minutes using the genetic algorithm.

Almost all other packages of this kind only offer exhaustive optimization, which can limit how much you want to try simply because, forgive the pun, it's exhausting.

This is good stuff. Try it! You will like it.

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RELATED READING
Peterson, Dennis D. [2009]. "Jurik Tools," product review, *Technical Analysis of* STOCKS & COMMODITIES, Volume 27: April.

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