NeuroShell Trader

With Fuzzy Pattern Recognizer

NeuroShell Trader Series

Ward Systems Group
I N C O R P O R A T E D

NEUROSHELL TRADER'S FUZZY PATTERN RECOGNIZER
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Product: Advanced add-on software application for scanning price data with NeuroShell Trader.
Price: $249

by David Penn

NeuroShell Trader's Fuzzy Pattern Recognizer (FPR), a module of NeuroShell Trader, looks to accomplish two tasks that have vexed traders working with computerized systems. The first is to develop a system that will scan price data series for particular patterns or setups that can be traded. The second, much more complicated task is to tune that system so it is able to catch near-misses and close-enough situations, and not leave too many good trades unexecuted.
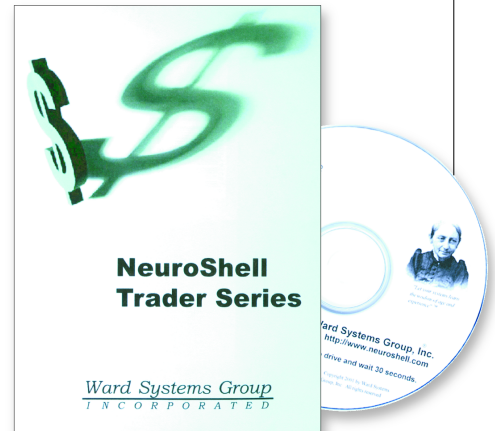
Many aspects of price behavior can be relatively easy for one person to communicate to another. If you read that "price falls sharply, then holds, then resumes steep descent," you could probably picture in your mind's eye some chart that fits this description. But such perfectly good, perfectly clear English is often fuzzy to the coding of a computer program. A program would need to be told the difference between "fall" and "fall sharply," what "hold" means and for how long, whether "steep descent" means the same thing as "falls sharply" and how any of this is going to be quantified and then *re*communicated back to you in the form of an alert or trading signal.

FUZZY MATH MEETS FUZZY LOGIC

NeuroShell Trader's Fuzzy Pattern Recognizer (FPR) is essentially an array of indicators. The software uses two sets of eight "fuzzy (verb) rule" indicators (called, helpfully enough, "Fuzzy1," "Fuzzy2," and so on), each of which deals with a particular area of fuzziness. For example, Fuzzy1 handles what are called "1 segment" rules (a segment is a group of trading bars; the software default segment size is five bars, with a minimum of two). A "1 segment" rule would be "open rises," in contrast to a "2 segment" rule, which might be "open rises, then rises sharply" (Figure 1). The specific parameters for these indicators are not provided, but are default values from NeuroShell Trader.

The second set of eight "fuzzy (verb) rule" indicators comes with genetic algorithm (GA) optimization. The FPR's internal logic engine parameters for these indicators (which also cover "segment rules") are exposed to the user and can be optimized.

The point of providing both indicators with GA optimization and indicators without GA is that while the former can provide results that are possibly superior to those derived from indicators without GA, changing the internal fuzzy logic engine parameters, which allow for various ranges of variation, can be complicated — especially if the results are not optimized. In fact, NeuroShell instructs users frankly that the company knows of "no way to set [the parameters] manually" and strongly urges the use of the genetic optimizer to fine-tune

the parameters.

One major tuning function for the fuzzy (verb) rule indicators is the Max Change function, which allows the user to specify how many points an advance needs to be to qualify as, for example, "rises sharply." Similarly, the number of points required for a decline to be considered a "sharp fall" can also be programmed into the application. Because various price series (relative strength index, moving average convergence/divergence, and a number of other technical analysis indicators) can be used with the fuzzy rules, Max Change can also be used to respond to extremes or sharp movements in technical values as well as price values.
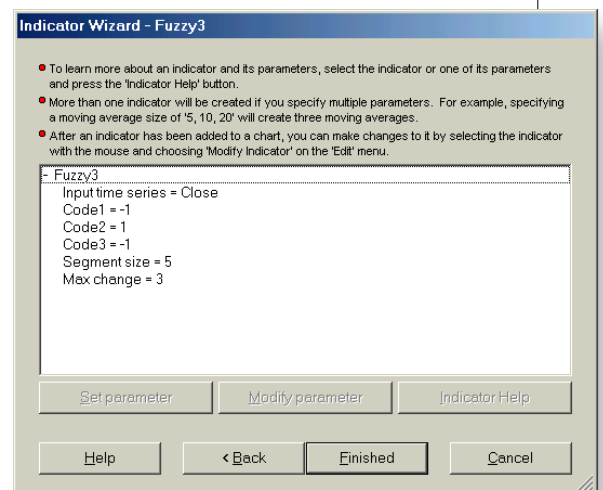
In addition to the fuzzy (verb) rule

Fuzzy Pattern Recognizer scans price data series for patterns or setups that can be traded, including near-miss and close-enough situations.

FIGURE 1: INDICATOR WIZARD AT WORK. Inserting Fuzzy Indicators couldn't be much simpler, thanks to NeuroShell Trader's helpful, step-by-step menus.

indicators, the FPR includes three FuzzyOR rules (again, FuzzyOR1, FuzzyOR2, FuzzyOR3) and three FuzzyAND rules (FuzzyAND1, FuzzyAND2, FuzzyAND3). These indicators can help a trader triangulate a particular position that may arise as a result of different or a combination of price moves. For example, a trader may be waiting for a particular security to either rise, hold, then rise again or to rise, drop sharply, and then rise sharply. The FuzzyOR and FuzzyAND rules would make it easy for a trader to set up the FPR to alert to both situations.

FUZZY LOGIC AT WORK

The first, and most basic, way of using the FPR's Fuzzy Indicators is to find patterns and setups. To do so, use the Indicator Wizard to load the Fuzzy Indicators. The output — the degree to which the chart pattern being studied matches the qualifications set up in the Fuzzy Indicators — will be represented as a value between zero and 1. By comparing the actual chart to the output bars, traders can determine how significant a match they require, as well as get clues for further optimization to the initial indicators (such as adjusting the Max Change).

But perhaps the most common way that FPR is deployed once users become more accustomed to the software is in actual trading strategies. It is fairly easy to spot buy and sell signals using the output bars at the bottom of the output chart (Figure 2) as confirmation of buy and sell signals that appear on the actual price chart or data series in the case of RSI or MACD, for example. The Fuzzy Pattern Recognizer also features a relational A>B indicator that can be used to oppose the output value with a specific numerical.

I tested the FPR on the Nasdaq 100, or QQQs. I wanted to see what the Fuzzy Pattern Recognizer would make of a simple "buy the dips" trading setup during one of the most spectacular bull markets in recent memory. First, I entered a Fuzzy3 indicator, "rise, fall, rise sharply," and kept the defaults for number of bars or periods at five and the maximum change (what triggers the
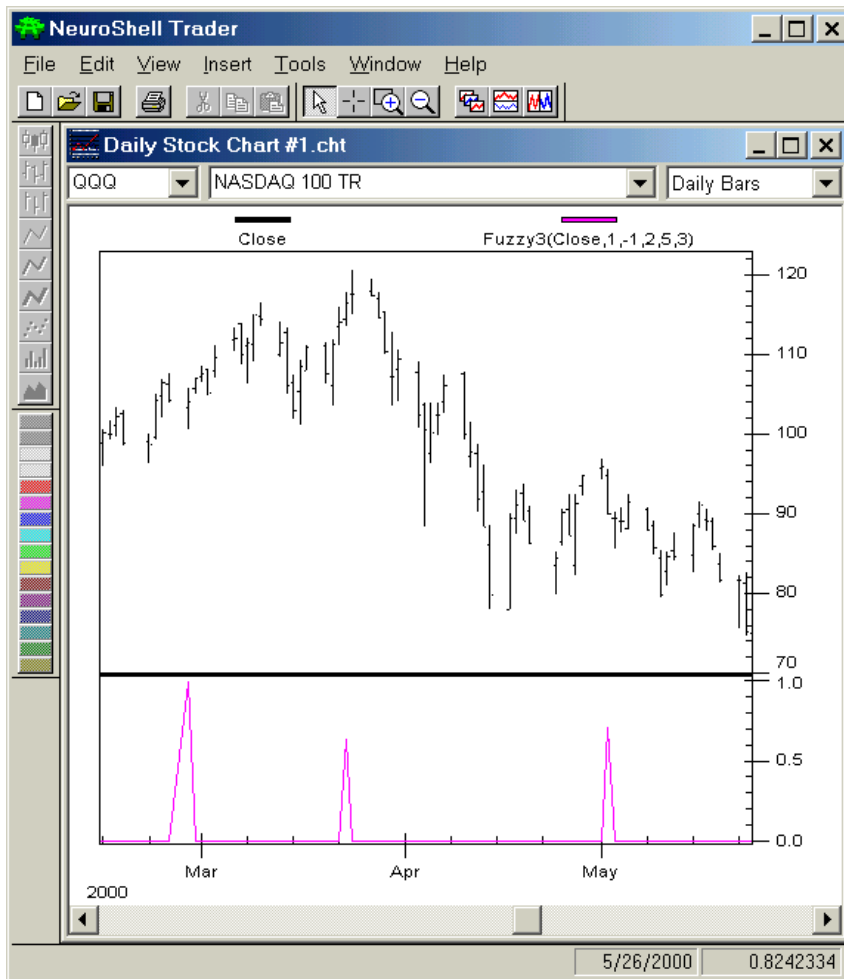

FIGURE 2: FUZZY CHARTS. A close-up of three fuzzy "matches." The Fuzzy Indicator was set up as "close rises, falls, then rises sharply." The best match occurred in late February.
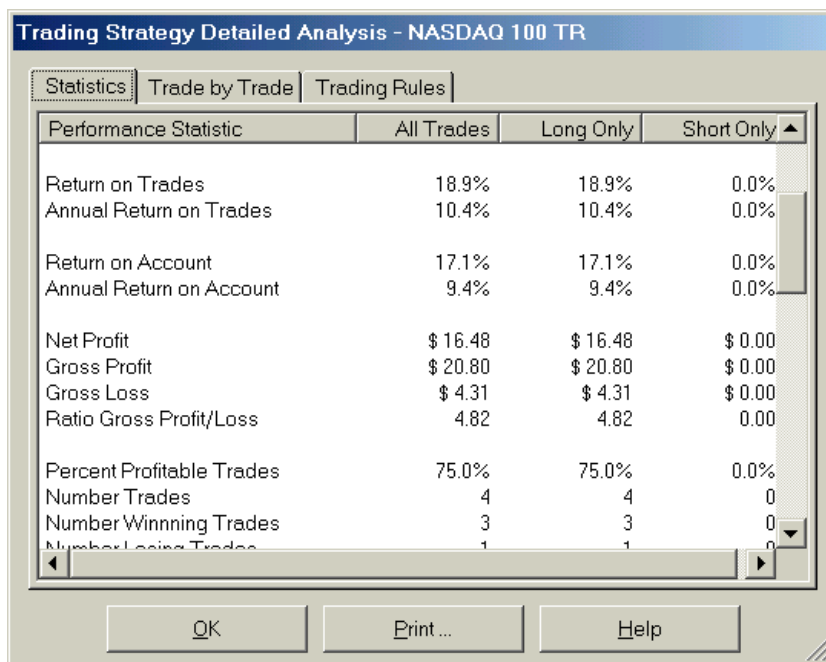

FIGURE 3: FUZZY STRATEGY. How fuzzy was it? NeuroShell Trader provides a detailed review of the trading system's performance.

difference between "rise" and "rise sharply"?) at three. From there, my buy long condition was a simple relational formula (A>B), in which "A" stood for the Fuzzy3 indicator and "B" represented the degree to which the price action of the QQQ matched the Fuzzy3 indicator on a scale of 0.0 to 1.0. I wanted to catch as many trades as possible, so I entered 0.55. As for selling, I chose a similarly simple variable, requesting that the system sell 20 bars after the trade was entered.

From June 21, 1999, to May 31, 2000, this small, simple system produced four total trades, three winners and one loser. The largest winning trade profit was $11.23 on the dollar and the largest trading loss was $4.31 on the dollar. This information is readily available from NeuroShell Trader's Trading Strategy page (Figure 3), which documents a variety of data about the trading strategy employed, from profit/loss ratios and return on account information to maximum drawdown and trade span.

Like the other indicators and trading strategies in NeuroShell Trader, the Fuzzy Pattern Recognizer can be optimized for maximum efficacy. Beyond the Strategy page, the program provides a compilation chart including the data series, the Fuzzy Indicator "matches," and a chart of the actual buy and sell signals in the trading strategy itself (Figure 4).

A NOT-SO-FUZZY FINALE

One of the things that makes the Fuzzy Pattern Recognizer relatively easy to use is that it requires little in the way of programming or coding talent in order to study a number of different trading setups and strategies. Compared even to simple languages such as MetaStock's or even the one used by Excel, the Fuzzy Pattern Recognizer is largely point and click. Users are prompted, step-by-step, through both the process for establishing a new fuzzy indicator as well as in using the Trading Strategy Wizard to deploy the fuzzy indicator in whichever data series (price, indicators and oscillators, and so forth) is being examined. If that isn't enough, the
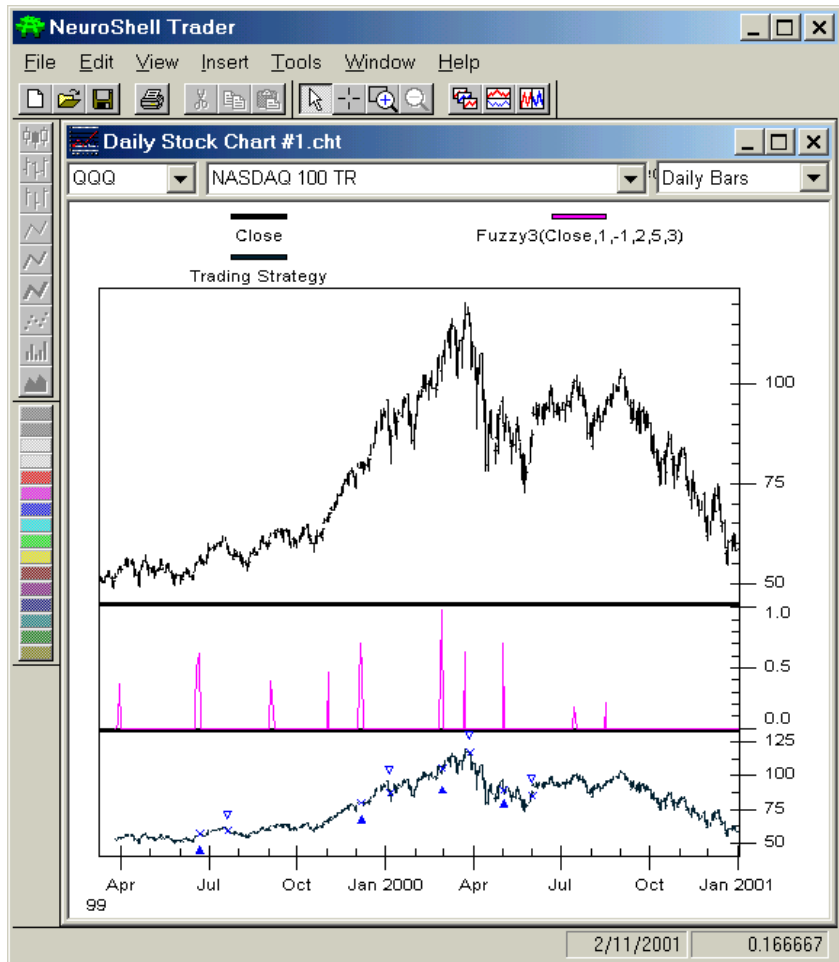

FIGURE 4: FUZZY FINALE. A final chart is provided with the data series, Fuzzy Indicator "matches," and a chart with entry and exit positions for a trading strategy built around these Fuzzy Indicators.

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NeuroShell Trader Tutor is formatted so that whenever a new item is opened in the NeuroShell Trader program, the Tutor automatically jumps to the corresponding section of the tutorial. This feature is a helpful way to bridge the gap between NeuroShell's training videos (which are highly recommended before starting to work with NeuroShell) and working with the program without any assistance whatsoever.

Users I spoke to underscored this last point in particular. One user who said he was "blown away by the product" noted

the learning curve for NeuroShell Trader's Fuzzy Pattern Recognizer was such that both novices and experienced traders could benefit. As someone who had considerable experience writing trading strategy programs, another user pointed out that it would take an exceptional amount of work to write programs the way that NeuroShell Trader's FPR does readily and quickly. Calling it "bulk force optimization," he appreciated the way the program did most of the work, leaving him with time to analyze the results and consider new

strategies to test.

Another plus in some users' minds was NeuroShell Trader's walk-forward testing, which one user called "unbelievable." Although this particular user was familiar with a number of other neural net–based products such as BioComp's NeuroGenetic Optimizer and BrainMaker, he felt the walk-forward testing available through NeuroShell Trader was easier to use and involved less generalization than others of its type. NeuroShell Trader's walk-forward testing is available through the Prediction Wizard and can, of course, be used with the Fuzzy Pattern Recognizer in the same way the Indicator Wizard can be used with the FPR. Here again, the software's propensity for bringing users along one step at a time through menus is especially helpful.

ALL IN ALL

NeuroShell Trader has managed to combine what one user called "ease of use and efficacy" to produce in the Fuzzy Pattern Recognizer an add-on that is more flexible and provides more variables to help fine-tune trading strategies. And given the increasing number of people getting interested in technical analysis, trading software, and trading strategies, the moderate learning curve of both the base software and the add-on is a benefit. Whether NeuroShell Trader's Fuzzy Pattern Recognizer is used as a trigger to enhance signals given by another trading system or as the main component in the development in a trading system, the add-on is a must-have item for those looking to get just a little more out of a NeuroShell Trading system that already has a lot to offer.

David Penn is a Staff Writer for STOCKS & COMMODITIES.

†See Traders' Glossary for definition   **S&C**