



Stock Analysis Using Neural Models

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My Experience

I am new to the trading world and, normally, perform stock analysis on chart using traditional indicators and methods before making any trading decision. Stock analysis is getting more and more complicated with many fundamental factors influencing the price movement of a stock. With so many markets interacting at the same time, it is difficult to analyze the technical indicators and fundamental factors separately. The solution is Neural Models that can be used to forecast price movements. I would like to share some of my experience of using Neural Models in the Tradecision Professional software.

Genetic Algorithm and Exhaustive Search Optimization Methods

TradeDecision Professional software comes with Genetic Algorithm (GA) and Exhaustive Search (ES) optimization methods. I performed a comparison between these methods using 13 inputs (6 internal inputs, 7 external inputs) and the price data range of 1500 bars.

Time Comparison

The GA method took as little as 12.16 minutes as compared to 20.03 hours for the ES method.

Figure 1: GA Method

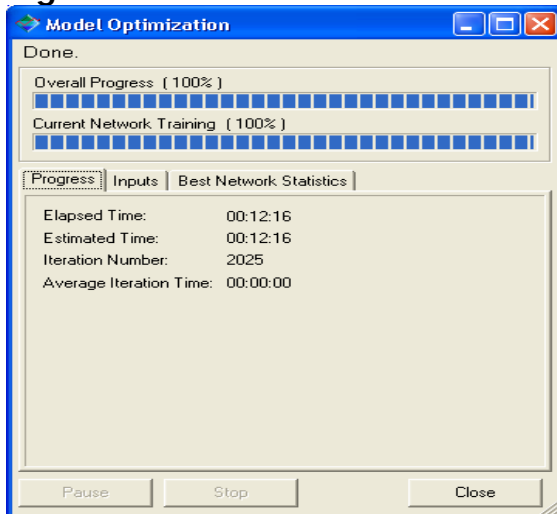
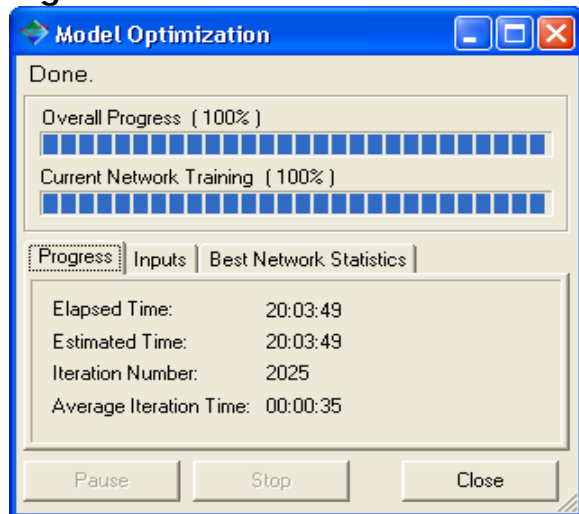


Figure 2: ES Method



Model Performance Comparison

Using the GA method, same input has high importance whereas they are opposite in the ES method. The ES method takes 20 hours longer! Therefore, GA is a good optimization method for fast neural model analysis.

Figure 3: GA Method

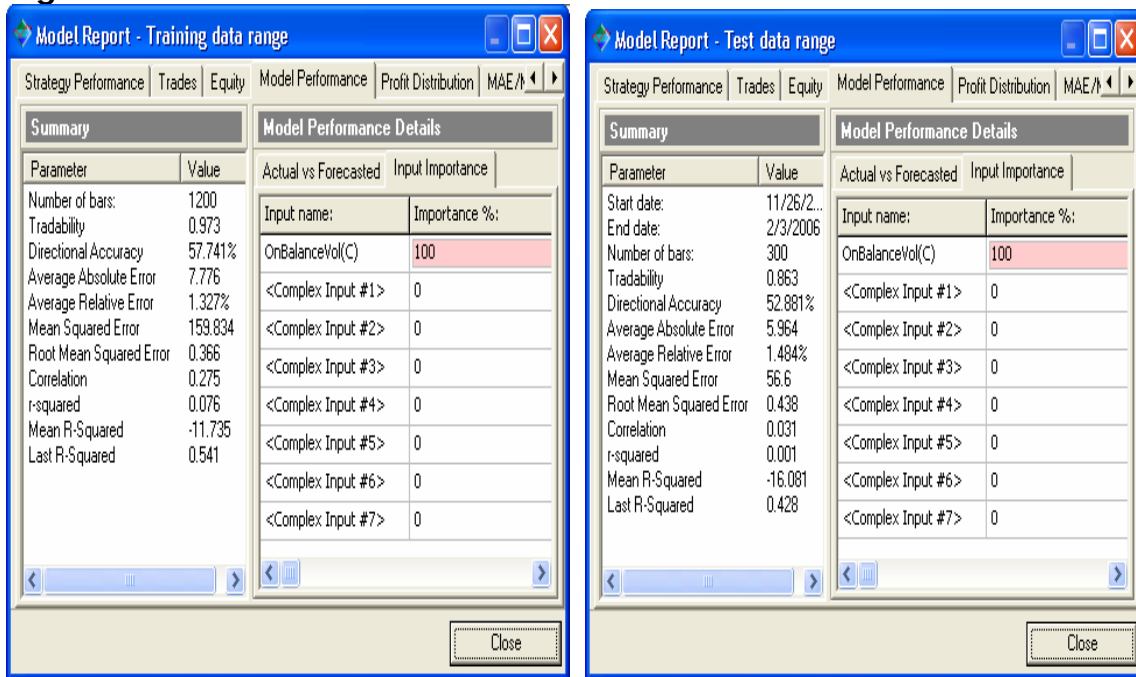
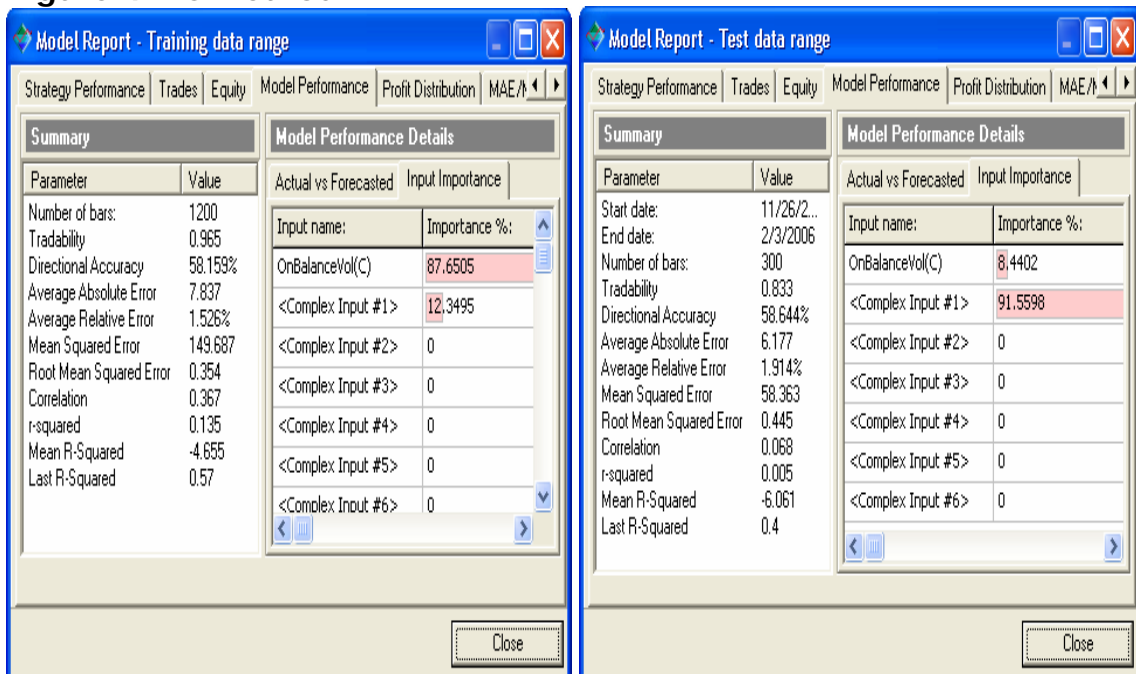


Figure 4: ES Method



Improving Price Forecasting Using External Input

Tradecision Professional software comes with an external input capability. I performed a comparison using GA without any external input (Model 1) and with external input (Model 2).

Figures 5 and 6 illustrate the comparison between the model performance results of the two models. One external input into Model 1 has significantly improved the tradability of the test data range in the Model 2.

I have included the forecasted price for both models in the price chart as shown in Figure 7. It clearly shows that Model 2 has a better price forecasting capability, especially on March 3. The forecasted price by Model 2 is \$25.07, which is close to the High of \$24.99 as compared to forecasted price by Model 1 being \$27.17.

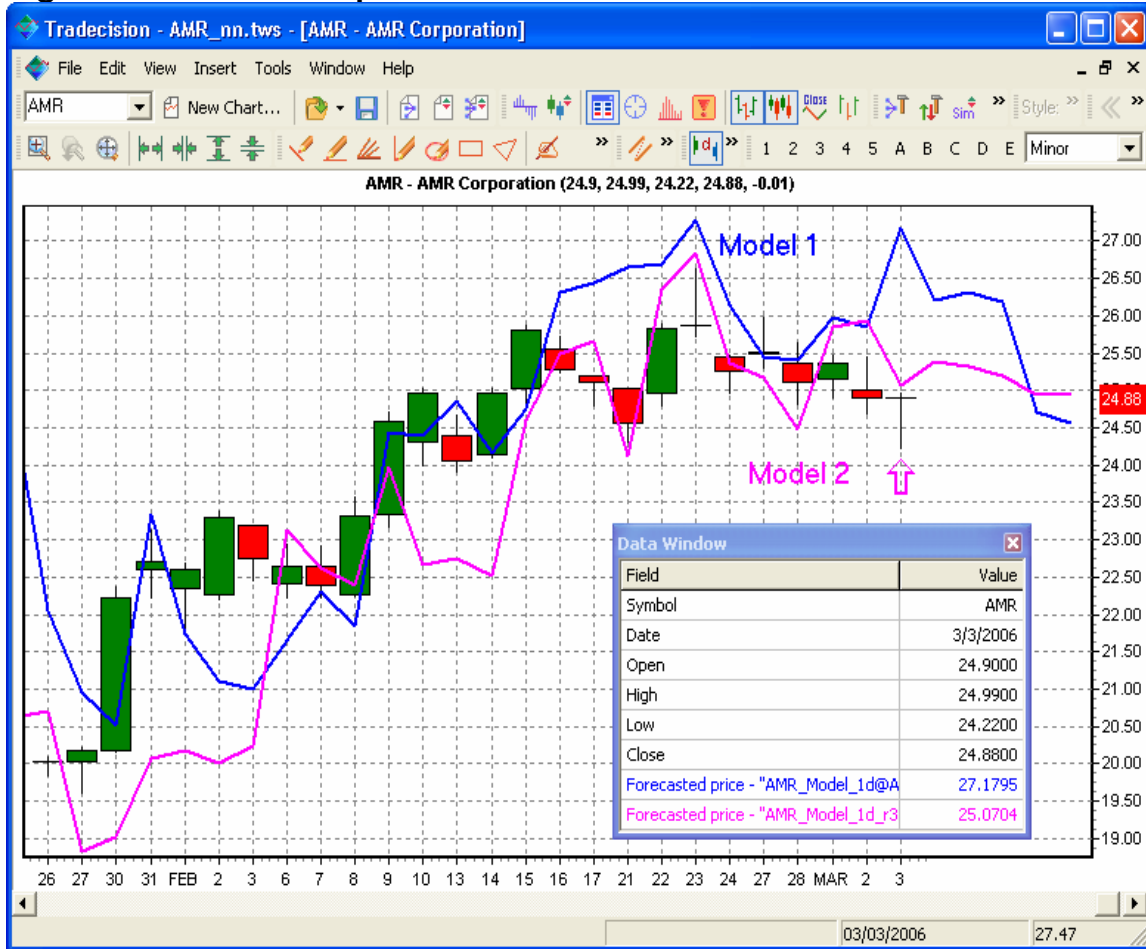
Figure 5: Model 1

Summary		Model Performance Details	
Parameter	Value	Actual vs Forecasted	Input Importance
Start date:	5/10/2005		
End date:	2/23/2006		
Number of bars:	200		
Tradability	0.522		
Directional Accuracy	60.513%		
Average Absolute Error	10.042		
Average Relative Error	5.617%		
Mean Squared Error	158.878		
Root Mean Squared Error	0.903		
Correlation	0.144		
r-squared	0.021		
Mean R-Squared	-0.203		
Last R-Squared	-0.754		
		Input name:	Importance %:
		AccDist(Volume)	18.235
		Correlation(C,0,25)	22.7657
		DMI(14)	24.6116
		OnBalanceVol(C)	5.5034
		PercentR(10)	15.411
		Volatility(10)	13.4732

Figure 6: Model 2

Summary		Model Performance Details	
Parameter	Value	Actual vs Forecasted	Input Importance
Start date:	5/10/2005		
End date:	2/23/2006		
Number of bars:	200		
Tradability	0.817		
Directional Accuracy	62.051%		
Average Absolute Error	6.419		
Average Relative Error	1.943%		
Mean Squared Error	64.024		
Root Mean Squared Error	0.573		
Correlation	0.147		
r-squared	0.022		
Mean R-Squared	-1.598		
Last R-Squared	0.264		
		Input name:	Importance %:
		PercentR(10)	38.7154
		<Complex Input #1>	61.2846

Figure 7: Forecasted price included in the chart



Summary

Tradecision Professional is a tool offering Genetic Algorithm and Exhaustion Search optimization methods. It can incorporate many fundamental or external inputs into Neural Models to improve forecasting. My journey continues and I'm working on further improving the model performance by including various fundamental inputs.

Thanks to Alyuda Research for giving me a very useful Neural Model analysis tool!