Opportunity and Significance

This software will enable General Motors to accurately predict commodity trends. Commodity futures are a large part of the global economy and accurate prediction software would be a massively useful tool.

Technical Objectives

We attempted to use machine learning technologies in order to predict seasonal and nonseasonal time series. These time series are inherently difficult to predict due to their pseudo-random nature.

Signal processing techniques and multiple neural networks were employed to improve the overall accuracy of the predictions. The classic ARIMA algorithm was used as a baseline metric for the machine learning approach.

In addition, these predictions were used to estimate future financial indicators in order to find buy and sell signals for the specified commodities.

Related Work and State of Practice

Other approaches utilize different levels of sentiment analysis to make predictions as well as many different neural network configurations to make the financial prediction. The previous semesters team utilized a single neural network combined with sentiment analysis to make their predictions.

Technical Approach, Accomplishments and Results

Signal processing algorithms were employed to preprocess the data used as input into our array of neural networks. By employing this preprocessing technique and using multiple neural networks, we were able to increase the prediction accuracy by over 20% for all metrics. Additionally, all metrics and trend lines were added to a simple dashboard style interface to allow for visualization of the data.

Next Steps for Development and Test

The current product is a proof of concept of merging machine learning concepts with a typical backtesting suite. Further development is required to open up the application to new data sources, adding more complete data visualization tools, and improved machine learning techniques. In particular, neural networks could be used to find trading signals within a commodity time series instead of the more classic financial indicators. The weight vectors of this neural network could help shed light on which variables are most important.

Commercialization Plan & Partners

This project was a collaboration between General Motors and Wayne State University.

This project is intended for academic research purposes and will not be commercialized at this time.

References