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Building a hybrid neural network model for gold price forecasting

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Abstract: Currently, many decision makers rely on Artificial Intelligent (AI) methods for forecasting. The Artificial Neural Network (ANN) has been the most powerful tool used for forecasting, especially in finance and economics. Recent research activities in forecasting with ANN have proven that ANN can be used as alternative to the conventional methods.

In this study a hybrid system for the gold price forecasting is proposed. Gold price forecasting, in term of input, will be addressed using time lags of gold price as inputs.

The aim is to build two hybrid systems: one hybrid system consists of neural network and a convenient statistical approach such as AutoRegressive Integrated Moving Average (ARIMA) and Generalized AutoRegressive Conditional Heteroskedasticity (GARCH), and another hybrid system consists of two neural networks- one for forecasting and the other for correction. These two systems will be compared in term of accuracy.

Input selections methods (e.g. Genetic Algorithm (GA) and Principle Component Analysis (PCA)) will be used to find the best time lags to predict the desired output. This will allow us to reduce the number of input variables that feed the model and simplify and improve the efficacy of the network architecture. Furthermore, the research is trying to optimize all aspects related to neural network architecture using Genetic Algorithms (GA). In this study, literature has been examined to find out different methods and models used so far in time series forecasting and how accurate they are. The result of the aimed models will be compared with a benchmark model in term of accuracy and complexity.

Keywords: *Artificial Neural Network (ANN), Autoregressive Integrated moving average (ARIMA), Generalized Autoregressive Conditional Heteroskedasticity (GARCH), Genetic Algorithm (GA), Principle Component Analysis (PCA)*

Abstract only