

STOCK MARKET PREDICTION SYSTEM USING MACHINE LEARNING APPROACH

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Abstract: The main objective of this proposed system is to find the best model to predict the value of the stock market. Paper proposes a gradient-based back propagation neural network approach to improve optimization in stock price predictions. Back propagation neural network method aims to determine the parameter of learning rate, training cycle adaptively so as to get the best value in process of stock data training in order to obtain accuracy in prediction. In, this paper we are going to present and review a more feasible method to predict the stock movement with higher accuracy. The first thing we have taken into account is the data-set of the stock market prices as like input of stock price history. Hence, our admin can upload stock price history i.e. open price, highest price, lowest price and close price of the day. It also focuses on data preprocessing. Secondly, after preprocessing the data, System reads stock price history and gives input to the Back propagation algorithm. In addition, the proposed paper examines the use of the prediction system in real-world settings and issues associated with the accuracy of the overall values given. The back propagation gives output as final predicted rate comes. The proposed system can get the output of prediction list of stock price and graph of prediction table like that user can view the final predicted result. The successful prediction of the stock will be a great asset for the stock market institutions and will provide real-life solutions to the problems that stock investors face.

Index Terms: Neural Network Back Propagation; Gradient Descent; Prediction; Stock.

I. INTRODUCTION

One of the boon of capital markets creates an event for people to participate in economic activities, especially in investing. One of the assets for investment is stock. Stock is securities issued by a company. Revenues earned from stockholders, depends on the company that issued the stocks. If the issuer is able to generate huge profits then the profits earned by stockholders will also be huge. The higher the benefits offered, the more advanced the risk that will be faced in investing. So it is required to predict the current stock price based on yesterday's stock price.

Stock price movements generally depend on economic conditions such as monetary policy indicated by the amount of money in circulation, interest rates, fiscal policy or taxes. While affecting the variation of stock prices is the performance of stocks, which became one of the factors of consideration to determine the preferred stock investors. A few decades ago, approaches in predicting stock prices have been applied such as linear regression, time-series analysis, and chaos theory. From some of these approaches there are still some errors in the prediction. The use of machine learning such as neural networks then the fuzzy system has been applied to make predictions as the solution of the problem.

The Adaptive Network Inference System based fuzzy approach has been used to predict stock price.

II. LITERATURE SURVEY

1. FPGA Realization of Backpropagation for Stock Market Prediction Author: Mamun Bin Ibne Rea, Member, IEEE

In this paper, we present the realization of back-propagation on Altera FLEX10K FPGA device for stock market prediction utilizing the parallelism that exists in the neural network architecture. This approach provides an increased speed of convergence of the network and efficiency for the stock market forecast. The stock market prediction neural network architecture comprises of three layers, input layer, hidden layer and output layer. There are three neurons in the input layer, two neurons in the hidden layer and one neuron in the output layer. Sigmoid transfer function is used for hidden layer and output layer neuron. Neuron for each of the back-propagation layer is modeled individually using behavioral VHDL. The layers are then connected using structural VHDL. This is followed by the timing analysis and circuit synthesis for the authorization, functionality and performance of the designated circuit which supports the practicality, advantages and effectiveness of the proposed hardware realization for the applications.

2. STOCKS MARKET PREDICTION USING SUPPORT VECTOR MACHINE AUTHOR: ZHEN HU ; JIE ZHU ; KEN TSE

Recent studies suggest particular strategies that overcome these problems. Support Vector Machine (SVM) is a relatively advanced learning algorithm that has the desirable characteristics of the control of the decision function, the use of the kernel method, and the sparsity of the solution. In this paper, we present a theoretical and experimental framework to apply the Support Vector Machines method to predict the stock market. Firstly, four company-specific and six macroeconomic factors that may influence the stock trend are selected for further stock multivariate analysis. Secondly, Support Vector Machine is used to evaluate the relationship of these factors and predicting the stock performance. Our results suggest that SVM is a powerful predictive tool for stock predictions in the financial market.

3. PREDICTION OF STOCK MARKET PERFORMANCE BY USING MACHINE LEARNING TECHNIQUES AUTHOR: KAMRAN RAZA

The stock market is a complex system and often covered in secrecy, it is therefore, very difficult to analyze all the impacting factors before making a decision. In this research, we have tried to design a stock market prediction model which is based on different aspects. The prediction model predicts market as positive or negative with the help of distinct attributes. The techniques used for prediction comprise of four different versions of Artificial Neural Network (ANN) including Single Layer Perceptron (SLP), Multi-layer Perceptron (MLP), Radial Basis Function (RBF) and Deep Belief Network (DBN). Other techniques include Support Vector Machine (SVM), Decision Tree and Naïve Bayes. All these techniques were compared to find the best predicting model. The results revealed that MLP performed best and predicted the market with accuracy of 77%. Each factor was studied independently to find out its union with market performance. The results proposed that behavior of market can be predicted using machine learning techniques

4. SURVEY OF STOCK MARKET PREDICTION USING MACHINE LEARNING APPROACH AUTHOR:ASHISH SHARMA ; DINESH BHURIYA ; UPENDRA SINGH

Stock market is basically nonlinear in nature and the research on stock market is one of the most important issues in recent years. People invest in stock market based on a few prediction. For predict, the stock market prices people search such approach and tools which will increase their profits, while minimize their risks. Prediction plays a very crucial role in stock market business which is very complicated and challenging process. Employing universal methods like fundamental and technical analysis may not ensure the reliability of the prediction. To make predictions regression analysis is used mostly. In this paper we survey of well-known efficient regression approach to predict the stock market price from stock market data based. In future the results of multiple regression approach could be enhanced using more number of variables.

III. PROPOSED SYSTEM

As per prediction system, developed in the stock price prediction to help investors in making financial decisions. In most researches it focuses on "lowest price buy", "highest selling price". On the "lowest buy" and "highest selling" strategy of stocks occurs when stocks are at the lowest price and sell shares when prices are highest.

For stock price predictions ANN technique is used with back propagation the dataset was pre-processed and tuned up for real analysis. Hence, our admin can upload stock price history i.e. open price, highest price, lowest price and close price of the day. Paper will also focus on data preprocessing. Secondly, after preprocessing the data, System reads stock price history and gives input to the Back propagation algorithm. In addition, the proposed paper examines the use of the prediction system in real-world settings and issues associated with the accuracy of the overall values given. The back propagation gives output as final predicted rate comes. The proposed system can get the output of prediction list of stock price and graph of prediction table like that user can view the final predicted result. The successful prediction of the stock will be a great asset for the stock market institutions and will provide real-life solutions to the problems that stock investors face. To test BPNN method, mean square error is used to predict result and data reality. The backward propagation of errors, of back propagation, is a common method of training artificial neural networks and used in conjunction with an optimization method such as gradient descent. The method repeats in two phase cycle, propagation and weight update. During back-propagation phase the output after forward pass is compared with the expected output which is then used to adjust link weights. The output of the proposed system is to predict the list of stock price. At the end of system the user can view the final result of predicted value of stock market.

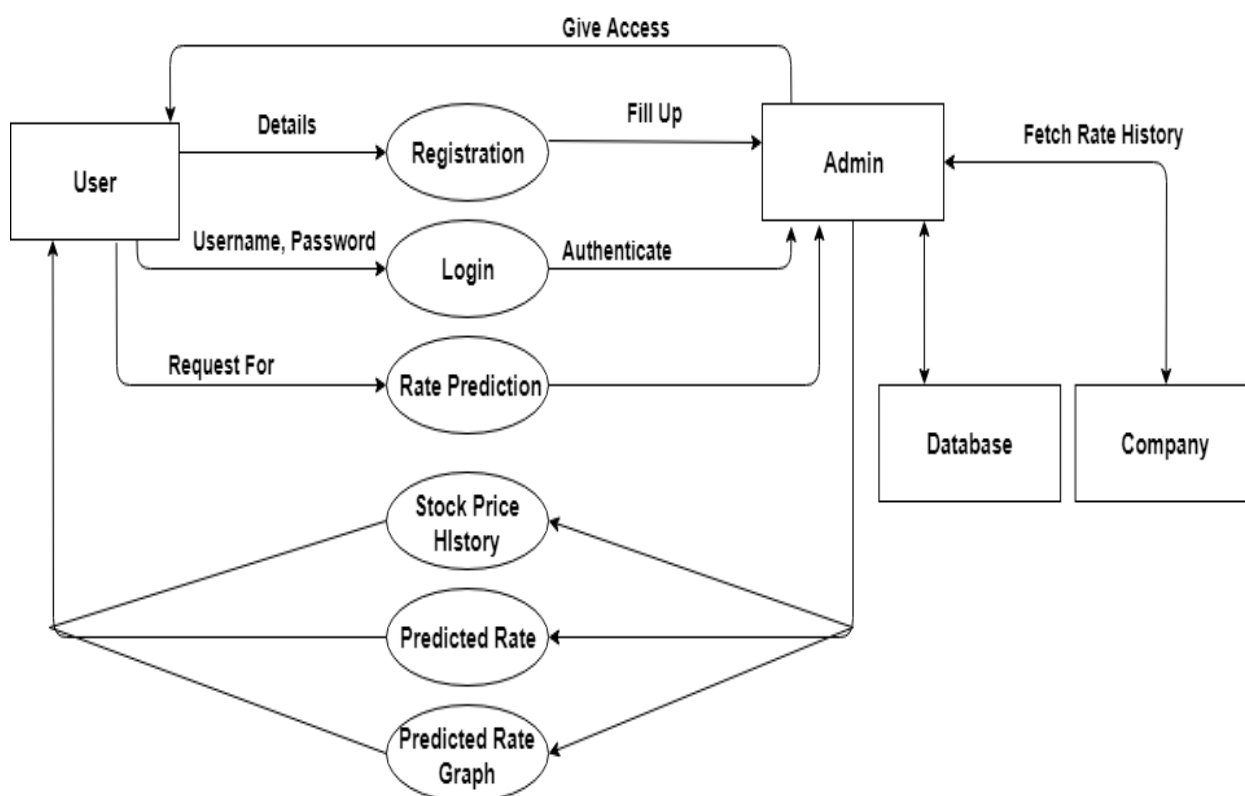


Figure: SYSTEM ARCHITECTURE.

IV. FUTURE SCOPE

Future scope of this project will involve adding more parameters and factors like the financial ratios, multiple instances, etc. The more the parameters are taken into account more will be the accuracy. The algorithms can also be applied for analyzing the contents of public comments and thus determine patterns/relationships between the customer and the corporate employee. The use of traditional algorithms and data mining techniques can also help predict the corporation performance structure as a whole.

In the future, we plan to integrate neural network with some other techniques such as genetic algorithm or fuzzy logic. Genetic algorithm can be used to identify optimal network architecture and training parameters. Fuzzy logic provides the ability to account for some uncertainty produced by the neural network predictions. Their uses in conjunction with neural network could provide an improvement for stock market prediction.

V. CONCLUSION

In this paper we have tested using back propagation neural network algorithm with optimization using gradient descent on stock price data.

From the results of model-based neural network algorithm analysis, that the use of gradient descent method can find the value of training cycle, learning rate adaptively, so to get the best result in prediction the value can be determined automatically and the impact can be more efficient in computing. The best results from predictions are obtained from the smallest values of the computational results of each prediction.

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