IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

APPLICATION OF ARTIFICIAL INTELIGENCE (AI) IN FORECASTING SHARE PRICES IN STOCK MARKETS – A CONCEPTUAL STUDY

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Abstract

The stock exchange is where the shares of listed companies can be bought and sold. The great thing about the stock market is that it predicts that the share price will become a successful trader. Today, the online trading platform offers everyone the opportunity to invest and make money if they accurately forecast the market with their financial knowledge over the past year, for a year. A basic D-mat account has been opened, but this share of traders is profitable. Global indices, demand and supply, news about a company cause stock price fluctuations, and this price fluctuation gives traders the opportunity to make a profit, but the risk is to determine the best price to buy and sell shares. Forecasting techniques play an important role here. Investors predict the market with the help of basic analysis, technical analysis and machine learning technology.

Investing in the stock market entails great risks due to nature's uncertainty and instability, which makes it difficult to predict the share price. The internal component of the nonlinear nature and complexity of the measurements makes it difficult to predict. The advantage of an artificial neural network is that non-linear and noisy data can be easily adapted, which improves the input-output ratio for non-linear data. Therefore, share prices can be predicted.

Multilevel perceptron (MLP) and the expected retrospective algorithm developed by Rumelhart. This model consists of multi-level programming with three levels of input, output and hidden. Feed Forward means that amount of data go out in one input direction. The MLP process is converted to three levels, the first data sets are loaded into the input neural layer and the processing of the input neurons is sent to the hidden layer and finally to the output neural layer. Each layer of neurons is related to weights in a specific way, the process of changing the weight is called the learning algorithm. This technique involves two types of forward and reverse processes. Forward the uploaded input to the network notes and converts them to output, but the weights must be specified. When we go back, errors are due to the difference between the actual and desired performance of the network, but the weights must be adjusted accordingly.

Keywords: Share price, Artificial Intelligence, Artificial Neural Networks

Introduction

A stock market is the place of buying and selling shares from listed companies. The beauty of share market is to forecast price of stocks in order become a successful trader. A treasure hunt for ocean traders. Nowadays online trading platform gives an opportunity to everyone on investment and profit earning if they precisely predict market with their financial knowledge, In last one year more than one core D-mat account has been opened but out this only one percent traders are earning profit. Price of shares cannot be predict without proper analysis because the various factors affecting the price changes of share like economic condition, market sentiment, global cues, demand and supply, news about a company these creates volatility in stock price and this volatility price is an opportunityfor traders to make profit but risk is to identify the best price to buy and sell the share. This is where price forecasting techniques plays a vital role. Investors predict the market using fundamental analyses, technical analyses and machine learning techniques.

Aim and Objectives of the study

The main objective of the study is to explore the application of AI in forecasting share prices in stock markets

The following are the key objectives

To explore the various AI tools applied by researchers and stock market specialist in forecasting the prices of shares

To apprehend the role of Neural network in predicting the price movement in stock markets

To analyse the critical value which AI offers in forecasting the share prices

Fundamental analysis

Fundamental analysis is a border level investigation of data analysis about economic, industrial sector and company. Basically it analysis open source of information like GDP, sector growth and companies balance sheet to predict share price whether its a overvalued or undervalued stock. It determines stock price mathematically and statistical value of a company without any bias. It includes ratio analysis, cash flow analysis and peer comparative analysis. Fundamental analysis commonly used for long term investment without considering daily market sentiments.

Technical analysis

Technical analysis forecast the market through price action movement of stocks. Stock market is driven by volatility in nature and volatility gives an opportunity for investors to make profit. Technical analysis times the market by using various indicators. Investors should know to how read the chart pattern and indicator. It ignores the fundamentals of the company and considers market sentiment. Various price actions used to predict the market namely Moving Average, Moving Average Convergence/Divergence (MACD), average directional index (ADX), Relative Strength Index these most commonly used techniques.

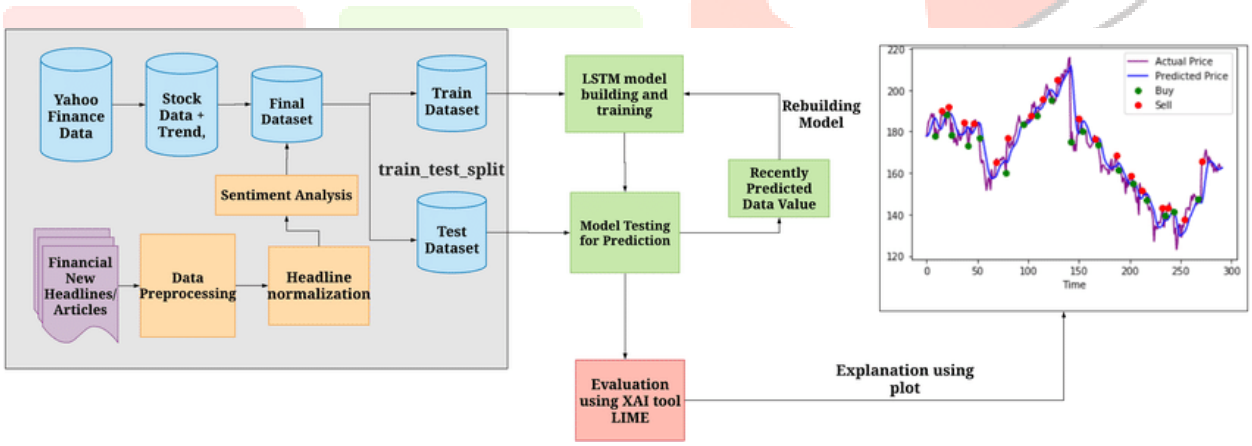
Machine Learning Technique:

Artificial intelligence has become most popular in last decade various industries started implementing this concept to enhance their performance. Investors use to predict stock market by their financial knowledge, experience, reading chart patterns and analytical skills all interlinked with human brain process and the process should have pattern which can be placed by AI. The objective of this study is to find out machine learning techniques can be placed by human brain in stock market and can it out perform compared with other techniques.

Artificial Neural Network (ANN)

The concept Artificial Neural Network (ANN) is computation of algorithms. The biological neurons are inspired from humans' and animal central nervous systems. There are multiple neurons in brain system each connected with another. The connected neurons are compute input value from the system with weighting pattern. ANN connects with multiple layer system which converts input into output.

ANN includes of three input (dendrites), weights (synapse), and output (axon). The neurons receives signal from input(dendrites) and biological neurons called dendrites receive signal from another neurons these are signals artificially changed by weights similar to the copy of human brain. The activated signals are converts as an output called axon. The concept ANN is to act like human brain with artificial functions. The human brain characterise is computation of abstraction, discovery, association, and generalization which complex in nature.ANN is try to copy of human brain with mathematical model.



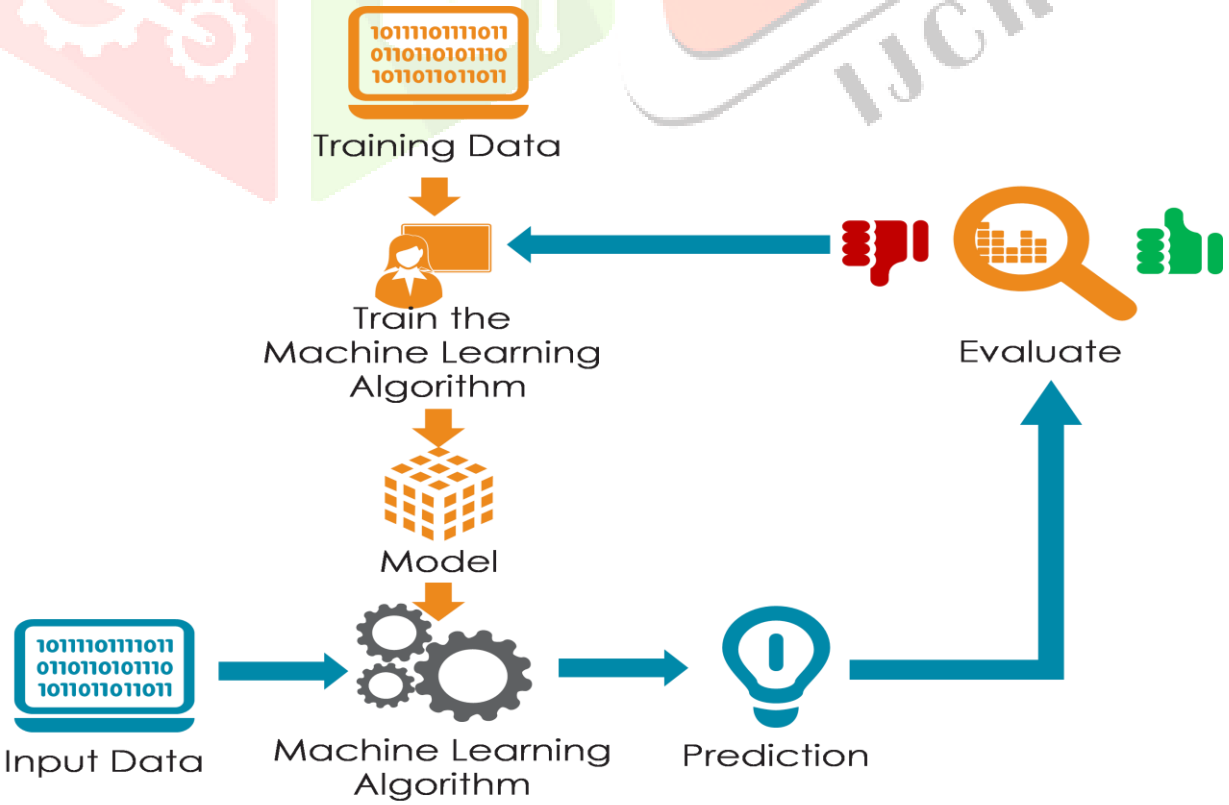
Many researchers contributed towards development of ANN model and publicised more than more than 100 articles. In stock market researcher has done by combination of ANN and neuro-fuzzy model. The fuzzy theory deals with uncertainty, information processing and language. Every human needs to communicate with other it require inter link process called communication in a same way fuzzy theory inter link between human and computer. The fuzzy number converts uncertain processing into output with all possible answers, human need to make decision from an output of the subjectivity. You can further communicate with computer to make a better answer through modified membership language. Nature of share market is full of uncertainty about future price of stock. The fuzzy theory will be a good partner in stock market to predict the future price with using optimum structure of ANN and genetic algorithm with reference of share market inputs. Benefits of using neural network in stock market it deals with large set of numerical

data and will provide useful information from past data which most important in share market because most of the time history repeats itself.

Review of Literature

Ze Zhang, et.al (2017) recommended using the Elman network to predict the opening price of a stock exchange. Normally, the Elman neural network is a local repetitive neural network with an environmental layer that is similar to previous conditions and is very suitable for solving time series problems. Because the Elman network is limited, this article uses a self-customizable alternative tool algorithm to optimize network weights and boundaries. Finally, this article checks this model at certain stock prices and compares it with the BP network and the Elman network to get the result that shows that both the precision and stability of this forecast model is better than the traditional one. .

Nonita Sharma et al (2017) focused on predicting future stock market indexes based on historical data. The experimental valuation is based on 10-year historical data from two indices, namely CNX Nifty and S&P Bombay Stock Exchange (BSE) Sensex from Indian stock exchanges. The predictive performance of the proposed model is compared with the known support vector regression. Technical indicators are selected as inputs to forecast models. The share price's closing price is the forecast variable. The results show that the proposed system overcomes vector regression support and can be successfully applied to create stock price forecast models. Yaojun Wang, et.al (2016) used social media discovery technology to quantify market shares and, among other things, to predict short-term stock prices. In this article, using the effective market hypothesis, the authors obtain information from comments shared on social media and then process data into emotional vectors. When we tested the tracking algorithm for social media, we also found that the SVM model with segment index has greater prediction accuracy than the SVM model without the combined segment index. The results of the experiment show that by using tracking on social media along with other information, the prediction model for stock prices can predict more accurately.



Mustain Billah, et.al (2016) proposed an improved algorithm for training artificial neural network from Levenberg Marquardt (LM)]. Levenberg Marquardt's advanced neural network algorithm can predict the potential closing price at the end of the day, with less memory and time required, from previous stock data from the Dhaka Stock Exchange, such as opening price, high, low, total stock sales. This improved LM training algorithm proves that the neural network is a better computer tool for predicting the closing price of stocks from the Bangladesh Stock Exchange perspective. It can also be used for forecasting purposes. In the future, we will use this concept to predict the purpose of predicting network traffic.

Yamini Nivetha, et.al (2017) created a prediction model by analyzing different prediction algorithms. The forecast model is based on a monthly forecast and a daily forecast to predict the market price the next day. This model calculates the open market value for the next day. A comparative study of these three algorithms is performed, which are multiple linear regressions, the support vector machine and the artificial neural network. The stock price is predicted using emotion analysis, the best prediction algorithm. The results show that the deep learning algorithm works better than MLR and SVM. In the deep learning algorithm, the hidden level learns from each prediction. Therefore, neurons in the output layer give the best results. The artificial neural network is the best prediction algorithm.

Harun Ercan (2017) presented this in the Baltic countries. Artificial neural networks are not usually used to predict financial failures. This study aims to predict the value of the OMX Baltic Benchmark GI Market Index (OMXBBGI) using artificial neural networks. Baltic stock market research uses the index price and the EUR / USD exchange rate to predict the index. The results showed that Baltic market prices were successfully predicted using the NARX method with the following variables: exchange rates and previous day indicators. The uniqueness of the article stems in particular from variables that ANN has never tested to predict Baltic stock prices.

Discussion

Stock market investments lead to high risky because of uncertainty and volatility in nature therefore difficult to forecast price of share. Inbound component of nonlinear and complexity nature of shares makes it more difficult to forecast. An advantage of artificial neural network finds easy to adapt nonlinear and noisy data so it can improve an input output relationship from nonlinear data. Therefore price prediction of stock market is possible.

Multilevel perceptron (MLP) and feed forward backpropagation algorithm developed by Rumelhart. This model consists of multilevel layer programming which has three levels of layer input, output, and hidden layer. Feed forward means data sets going in one direction input to output. MLP process coverts into three layers, first data sets are loaded in input neuron layer and processing of input neurons send to the hidden layer and finally to the output neurons layer. Each layer of neurons connects between weights in a particular manner the weight change procedure is called as learning algorithm. This technique has a two type of process forward pass and backward pass. Forward pass input data loaded in the notes of network and its convert into result as output but weights should be fixed. In backward pass occurring errors find out by the different between actual and desired network performance but weights are should be adjusted accordingly.

Backpropagation model shows good result in simple problem but it difficult to calculate problems which have complexity. It will face two problems while calculating slow convergence and traps in local minima. To solve this problem backpropagation should undergone training called gradient decent algorithms and learning rate should be specified. The change of weights is the key for performance, learning rate defines change in weight. The weights are creates impact on error, to rectify change in weight requires more training. There are several researcher improved methods to solve this problem with using gradient decent algorithms. Few modifying techniques with weight adjustments are Momentum, adaptive learning rate, both momentum and adaptive learning and resilient backprogation. We limit our study into one specific model momentum learning. Neural network software programs have an inbuilt value for learning rate and momentum which will give better result. Momentum term indicates how past weight changes create an impact on current weight changes. The learning rate provides varying spread rage from 0.1 to 0.9 in literature view. Usually training starts with maximum learning rate of 0.7 and it decrease as per training. Most of the neural network programs have an inbuilt capacity to change the learning rate automatically to reduce weights and increase the momentum value.

Study of multilayer feedforward network (MLP) with backpropagation learning methods used to find various stock market index and individual stock to predict the future share price. The data of particular stocks uploaded in neuron network consist of input layer, hidden layer and output layer. The past of stock are under input layer according to the accuracy weights will change in hidden layer to get desired out come. Hidden layer converts the input with weight adjustment called learning rate and hidden layer consist of more than sixteen neurons due to accuracy. Through this method will find out the value of particular stock compared with actual value and predicted value.

One idea would be to use a cross-functional approach to make predictions for the market index using a developed artificial neural network (EANN) and the algorithm evaluates the quality of the decision based on the return on investment (ROI). decisions, but transaction costs are not taken into account and can and will adversely affect reported returns depending on the situation. Using in-depth learning techniques in news headlines can help solve more complex physical language functions that can help models gain greater predictability. In addition, a longer title can help build such a complex model. But the performance of the various algorithms was not very surprising given the nature of the underlying data.

According to the Bayesian artificial portfolio selection intelligence system, performance is better than that of the human portfolio manager and the market, but the neural network cannot converge due to the wide variety of educational data. The performance classification of vector machines, neurofusive systems, multilevel perception of neural networks depends on the degree of precision applied, and SVM got its best performance in three inputs. The classification of these techniques depends on the degree of precision used, but does not allow the focus on the use of macroeconomic variables.

The optimized neural power supply application surpassed other types of machine learning techniques with relatively high efficiency and accuracy. However, this accuracy is limited to changes in stock prices and not to predict closing stock prices, but Twitter's sentiment analysis was used because the stock predictor is not reliable enough to be used as the sole forecaster. It is necessary to create an effective model for low-error forecasts for future stock market trends and improve forecast accuracy. the impact of news on social media is not taken into account. Data mining can automatically extract important information from large amounts of data that affect stock prices, but it is necessary to analyze the consequences of emotions and various analyzes of the financial markets. The training regression algorithm and the Feedforward multilevel network

as a price network model, but the problem with the analysis is that the removal of trading rules from a chart study is very subjective, resulting in analysts drawing different trading rules studying the same graphs.

Conclusion

In this article, we conclude that stock market forecasts are a major problem in forecast analysis due to the high complexity of the data set. The stock market forecast method involves several steps, such as exports and ranking services. The stock market forecasts planned so far are based on the ranking method. In the future, a hybrid ranking method is planned to provide high accuracy in stock market forecasts.

An artificial intelligent is an architecture of neural brain system of human. An artificial neural network computes the large number of data with help of artificial neurons. The network computes set of input data with weight adjustment determines the output. Human brain has a combination of several neurons system connection between them it is not easy to get the human brain with large set of input data, in traditional method it requires expert system for computing highly complex problem and forecast stocks need more cost and maintenance. It also extracting human brain to system will be difficult process. But artificial neurons automated the neural network process. The similarity of ANN and stock is both are into the nonlinear process. ANN can extract the relationship between the input and output data without any prior knowledge about it.

Various researchers shows the result of Neural network system can determine the stock market price from the given input value and it can predict the market more than 0.5 wide rage.

To improve the performance efficiency of ANN it require more input to get better and accurate result to forecast the market

To predict the stock market with accuracy artificial neural network should be trained properly it can increase the accuracy rate.

The performance of an ANN which is affected by various factors researcher cannot determine single factor the study to compare with other published findings.

An observation of various researches shows the better accuracy rate of stock prediction in neural network is more than fundamental and technical analysis.

However stock market cannot be predicted with 100% accuracy to improve the efficacy of an ANN method it need various updated version with genetic algorithm for future betterment of investors and stock market cannot depended only on past data it also consider the present economical and political situation which affects the accuracy the study of ANN should improve it efficiency to analysis all the factors affecting the stock market in should consider micro and macro level of economic factors.

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