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Abstract—The ability to forecast the stock market with a high degree of precision and accuracy is important. When making forecasts, most stockbrokers use technical, fundamental, or time series analysis. A comparative study of selective applications concluded that ANNs are widely used in stock price forecasting and have a higher degree of control and relative similarity in predicted results.

Keywords—Stock Market, Artificial neural networks, Bombay Stock Exchange, Support vector machine.

1. INTRODUCTION

The theory of Automation is used to forecast future stock prices by parsing records, calculating expected value, sending users, and conducting operations such as buying and selling shares automatically. While the trend in stock market prediction is not recent, it continues to be addressed by numerous organizations. Being able to correctly forecast potential financial results is the equivalent to making a lot of money.

The dataset used in machine learning is extremely important. Since even minor adjustments in the data can have a large impact on the outcome, the dataset should be as precise as possible. This dataset contains five variables: open, near, low, large, and length.

The stock's open, close, low, and high bid prices are different at different times with nearly direct names. The model is then put to the test with the test results.

Since the relationships between past and future observations are not always deterministic, this amounts to expressing the conditional probability distribution as a function of past observations, as shown by the formula below [1]

\[ p(X_{t+d}|X_t,X_{t-1},...)=f(X_t,X_{t-1},...) \]

Traders can assess features that co-relate to changing the price of a given security, for example, by experimenting with various indicators to see if some seem to co-relate with major market terms. The parameters are predicted using a variety of functions. Binary threshold, linear threshold, sigmoid and tanh/hyperbolic are the most common ones [2].

To predict future stock prices, a hybridized approach is used to extend existing approaches by incorporating fundamental and technical analysis variables of the stock market. With the assistance of a feature reduction algorithm based on stock market prediction parameters. The Data Flow Diagram of general stock estimation is depicted in the figure below, Fig. 1.

Fig. 1: Data flow diagram of Stock Price Prediction
The three main steps are outlined in the following General Framework. To further explain the Framework, each process is listed below:

(i) Acquire experimental datasets/stock data
(ii) Data transformation and the selection of key technical indicators
(iii) Stock Market Classification and Forecasting

Stock data is gathered from blogs, and the dataset is compiled from well-known corporations. The following figure, Fig. 2 represents the general framework for Stock Price Prediction.

![General framework](image)

This survey paper compares previous work on stock price prediction, as well as the various data sets and algorithms/technology used. This paper aims to undertake an academic study of the issue in order to provide a new way of predicting market patterns. This study intends to perform a comparison of deep learning classifiers and extreme learning classifiers.

2. TECHNIQUES USED FOR STOCK PRICE PREDICTION

The various machine learning techniques used for the price prediction are explained below:

i. Artificial Neural Network (ANN):

One of the intelligent data mining techniques for detecting and generalising a fundamental trend from data is ANN [3]. ANN is capable of simulating and analysing complex patterns in unstructured data, unlike most other methods. The model is based on the basic structure of a Neural Network, which is made up of neurons that are organized in layers [4]. Each input load's weights are multiplied and applied before being sent to the neurons. These neurons make up the secret layer, also known as the activation layer. The cumulative weight is computed and transferred to the third layer, the output layer. The output layer consists of only one neuron, which will have the expected value in terms of the stock's closing price. [5]

ii. Neural Network:

The concept is based on biological neural networks. It is made up of interconnected neurons that use a connectionist approach to process information. The network adapts to the information that flows into it and attempts to anticipate the data that is needed. [4]

iii. Sequential Minimal Optimization (SMO):

The sequential minimal optimization [6] resolves the QP problem with no extra matrix storage or numerical QP improvement steps required. The SMO further divides the larger QP problem into smaller QP problems. It's a linear classifier that finds the greatest margin, or the shortest distance between the classifier and the data points nearest to it.

iv. Commodity Channel Index (CCI):

An oscillator is used in technical analysis to assess whether an investment vehicle has been overbought or oversold. Donald Lambert invented the Commodity Channel Index [7], which quantifies the relationship between an asset's price, a moving average (MA), and normal deviations (D) from that average. It's calculated using the following formula:

\[
CCI = \frac{price - MA}{0.015 \times D}
\]

v. Relative Strength Index (RSI):

The Relative Strength Index [8] is a technical momentum indicator that assesses whether an asset is overbought or oversold by comparing the magnitude of recent gains to recent losses. The following formula is used to measure it:

\[
RSI = \frac{100}{1 + \left| \frac{RS}{RS^*} \right|}
\]

Where, \( RS \) = Average of X days up closes / down closes.

3. MOTIVATION

Many people struggle with knowing when and how to invest their money. Despite the large sums of money and interest involved, there is still no clear response as to when and where money should be spent. While there are many algorithms available in the market for stock market prediction, ANN and SVM provide the stock value effectively and in a shorter period of time. There has been a lot of work put into predicting the potential movements of the stock market index or its return. Financial trading techniques have also been developed in order to convert predictions into gains. The primary goal of this research is to provide a brief overview of how to forecast the current state of the stock market using historical stock market values.
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5. FUTURE SCOPES OF STOCK PRICE PREDICTION

A successful prediction of a stock's future price may result in a large profit. Deep learning may be developed in the future to improve performance by taking into account financial news articles as well as financial news parameters such as closing price, traded duration, profit and loss statement, and so on.

The use of an unsupervised preposition in conjunction with supervise classifier may be included in the future scope of work. Also, by using a much larger dataset than the one currently used, the stock prediction method can be enhanced. When it comes to improving the precision of prediction tables, this can be very useful.

6. CONCLUSION

Based on the findings and experiments, it is clear that input data, as well as machine learning techniques, plays a vital role in prediction. When the data divided into train and evaluate, the number decreases dramatically, which is nothing but noise that can be completely eliminated from the dataset using filtering techniques, allowing the model to predict the outcome much more accurately. Furthermore, Most significantly, the above experiment not only assisted us in predicting the result, but it also provided us with useful insights into the nature of data, which we can use in the future to enhance the training of our classifiers. The project can be improved by adding more features and using different classifiers. Future work include the use of unsupervised preprocessor along with the supervised classifier.

7. REFERENCES


