



Stock Market Prediction Using Machine Learning Approaches - Detailed Survey

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Abstract: Stock market prediction and analysis are some of the most difficult jobs to complete. There are numerous causes for this, including market volatility and a variety of other dependent and independent variables that influence the value of a certain stock in the market. These variables make it extremely difficult for any stock market expert to anticipate the rise and fall of the market with great precision. However, with the introduction of Machine Learning and its strong algorithms, the most recent market research and Stock Market Prediction advancements have begun to include such approaches in analysing stock market data. The Opening Value of the stock, the Highest and Lowest values of that stock on the same days, as well as the Closing Value at the end of the day, are all indicated for each date. Furthermore, the total volume of the stocks in the market is provided, with this information, it is up to the job of a Machine Learning Data Scientist to look at the data and develop different algorithms that may help in finding appropriate stocks values.

Keywords- Stock market, machine learning, Prediction

1. Introduction

A stock, also known as an equity is a security that represents the ownership of a fraction of a corporation. This entitles the owner of the stock to a proportion of the corporation's assets and profits equal to how much stock they own. Units of stock are called "shares." Corporations issue (sell) stock to raise funds to operate their businesses. The holder of stock (a shareholder) buys a piece of the corporation and, depending on the type of shares held, may have a claim to part of its assets and earnings. In other words, a shareholder is now an owner of the issuing company. Ownership is determined by the number of shares a person owns relative to the number of outstanding shares. For example, if a company has 1,000 shares of stock outstanding and one person owns 100 shares, that person would own and have a claim to 10% of the company's assets and earnings. Indian Stock Market (i) Bombay Stock Exchange. It is the largest stock exchange in India. SENSEX is the index of BSE. Sensex or S&P BSE Sensex index, is the benchmark index of the Bombay Stock Exchange (BSE). (ii) National Stock Exchange NIFTY is the index of NSE. The NIFTY 50 index is National Stock Exchange of India's benchmark broad based stock market index for the Indian equity market. It represents the weighted average of 50 Indian company stocks in 12 sectors and is one of the two main stock indices used in India. The NIFTY 50 index is a free float market capitalization weighted index. More than 7000 companies are listed on BSE and NSE.

2. LITERATURE SURVEY

Title	Objective	Algorithm	Remark
Analysing the Trend of Stock Market and Evaluate the performance of Market Prediction using Machine Learning Approach	Analysing the Trend of Stock Market using real time data and Evaluate the performance of Market Prediction using various Machine Learning algorithms	Random Forest, SVM, Neural Network	The prediction accuracy of the stock exchange has been analysed and improved to 94.17% using machine learning algorithms. Neural networks yield the best accuracy.
Machine Learning Algorithms in Stock Market Prediction	Compare various ML algorithms for stock market prediction	SVM, Improved Levenbergmarquardt Algorithm, Self-adapting Variant PSO-Elman Neural Network, Linear Regression.	It was concluded that Improved Levenberg Marquardt is one of the best tools as it has the highest level of accuracy and efficiency with less memory consumption in the short term but in the long run but along with more complexities, the PSO-Elman model is better suited.
Improving traditional Stock Market Prediction Algorithms using Covid-19 Analysis	Enhance the stock market prediction ability of various common prediction models by taking into account the factors related to COVID-19	Decision Tree Regressor, Random Forest Regressor and Support Vector Regressor (SVR).	SVR provides better results compared to other algorithms and inclusion of number of cases and the number of deaths in a country due to COVID-19 improves the prediction ability of the models.
Study of Machine learning Algorithms for Stock Market Prediction	Compare various ML algorithms for stock market prediction	Random Forest Classifier, Support Vector Machine, K-nearest neighbour and Logistic Regression	Random forest classifier is the best algorithm with an accuracy of 80.7%.
Stock Closing Price Prediction using Machine Learning Techniques	Compare various ML models to predict stock closing prices	Artificial Neural Network and Random Forest Classifier	Artificial Neural Network is the best algorithm to predict stock closing prices.
The study making performance of various machine learning algorithms favouring investors in generating profits.	Compare several machine learning algorithms to predict stock price trends and compare the	Random forest classifier, SVM,MLP,machine, deep and reinforcement learning algorithm	Machine learning deep and reinforcement learning algorithms for predicting stock movement for making an investment decision

	outcomes.		is instrumental and reliable for traders.
Study of machine learning algorithms focusing on making investment decisions	Compare various ML algorithms for stock market prediction.	Adaptive stock technical indicators, computational efficient functional link artificial neural network, (ANN) on technical indicators	Adaptive stock technique is the best and prediction accuracy becomes more accurate and reliable.
Decision support framework for the stock market using deep reinforcement learning	Framework recognizes patterns, maximizes the profit obtained and provides recommendations to the investors.	The proposed decision support framework aims to build an AI-based on deep reinforcement learning techniques.	decision support framework for the stock market based on deep reinforcement learning to support stock market investors.
Stock Price Prognosticator using Machine Learning Techniques	Aims to predict the prices of shares more precisely, accurately using special algorithms using RNN by improvising back propagation.	LSTM, a higher accurate algorithm in giving out a future stock price forecasting is proposed.	The study attempted to predict accurately the next day price of the listed share. Hence, our active day trading strategy outperforms when compared to other papers in the Present domain of study.
Research on Stock Price Prediction Method Based on Convolutional Neural Network	This paper proposes a stock price prediction model based on convolution neural network, which has obvious self-adaptability and self-learning ability.	Convolutional Neural Network(CNN) which is a type of feed forward artificial neural network.	The CNN stock price forecasting method in this paper has high accuracy and high application value. Can be used for any other stock exchange where a sufficient amount of daily historical prices is available.

3. TOOLS

- Python programming higher installed in windows 10 or any distribution of Linux.
- Arduino IDE software
- Training of an ANN model using Coding Source in MATLAB.
- Python open source library called TensorFlow1 is used in order to train the neural network.

4. RESEARCH GAP

Taking in more parameters allows a model to make more complex computations and hence give better results at the price of memory and time consumption. The local datasets used had limitations in the parameters that could have been used. In future, more complex datasets with more training and testing

parameters for input could be used making the methods even better by reducing memory wastage, computation time and while giving an even more real precision with the prediction.

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