

## Stock Market Prediction Using Machine Learning

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### ABSTRACT

Financial exchange or Share market is maybe the foremost convoluted and complicated approach to figure together. Little possessions, financier enterprises, banking area, all depend upon this very body to create income and gap chances, a very confounded model. available Market Prediction, the purpose is to anticipate the longer term estimation of the monetary a lot of a corporation. The new pattern in securities exchange expectation advancements is that the utilization of Machine learning which makes expectations smitten by the qualities of current securities exchange lists via preparing on their past values. Machine Learning itself utilizes various models to create forecast simpler and genuine. Securities exchange expectation could be a significant effort within the field of money and putting in place organizations. Financial exchange is totally questionable because the costs of stocks continue fluctuating consistently thanks to various components that impact it. one in every of the customary methods of anticipating stock costs was by utilizing because it were recorded information. Yet, with time it absolutely was seen that different components as an example, people groups conclusions and other news occasions happening in also, round the nation influence the securities exchange, for instance public races, regular cataclysm then forth Speculators within the securities exchange seek for to amplify their benefits that they expect devices to dissect the prices and pattern of various stocks. AI calculations are utilized to plot new strategies to fabricate expectation models that may gauge the prices of stock and speak about the market pattern with great exactness. Numerous expectation models are proposed to fuse all the most considerations influencing the value of stocks. The paper centers round the utilization of LSTM based Machine deciding a way to foresee stock qualities. Variables considered are open, close, low, high and volume.

**Keywords** - LSTM, Regression

## I. INTRODUCTION

A right expectation of stocks can prompt tremendous benefits for the dealer and the merchant. Every now and again, it is brought out that forecast is turbulent instead of arbitrary, which would not joke about this can be anticipated via cautiously dissecting the historical backdrop of separate financial exchange. Machine learning is a proficient approach to show these cycles. It predicts a market esteem near the substantial worth, in this manner expanding the precision. Establishment of Machine learning in the region of stock prediction has spoken to numerous investigates as a result of its proficient and precise estimations.

Data collection is very important in this aspect as we rely on the data very much as we know predicting the stock market data. So, data must capture based on the model if we are predicting for intraday trading then we have to capture the data every minute or so that we can train the model in real time. If we are trying to predict swing, positional and options strategies then we have to collect the data based on that. The essential piece of Machine learning is the dataset utilized. The dataset should be as concrete as conceivable in light of the fact that a little change in the information can propagate gigantic changes in the result. In this task, the dataset is taken from the starting of 2003 to 2019 of the following stocks. This dataset involves following five factors: open, close, low, high and volume. Open, close, low and high are distinctive offer costs for the stock at discrete occasions with almost immediate names. The volume is the quantity of shares that are passed starting with one proprietor then onto the next during the time.

This paper discusses the LSTM model for prediction of stock market prediction. Long Short-Term Memory (LSTM) is an artificial recurrent neural network architecture (RNN)

## II. LITERATURE SURVEY

- Ishita Parmar, Navanshu Agarwal, Sherish Saxena, Ridam Arora, Shikhin Gupta, Himanshu Dhiman and Lokesh Chouhan have proposed an idea with the usage of Regression and LSTM based Machine learning to predict the stock values. The authors of this paper have given their views how fast the Regression and LSTM model can give accuracy for the stock market prediction.
- Sondo Kim, Seungmo Ku, Woojin Chang and Jae Wook Song have proposed an idea that predicts the US stock prices by integrating time-varying effective transfer entropy and various machine learning algorithms. The authors of this paper have used 3 to 6 months to analyze the stocks of a given company and then predict the performance of the stock. They have used logistic regression, multilayer perceptron, random forest, XGBoost and long short term memory network. Finally in conclusion they have given that the multilayer perceptron and long short term memory network are best for stock market prediction.
- Vyom Unadkat, Parth Sayani, Prachi Doshi, Pratik Kanani have proposed an idea that using Recurrent Neural Network and LSTM model can be used to get an approximate estimation of the future stocks. This will help in choosing the right stock for investment and thus improve the return of investment in that stock. The data taken from the stock market was from a span of 20 days to 60 days to get the correct accuracy of the future stock market prediction.
- Jia Wang, Tong Sun, Benyuan Liu, Yu Cao and Degang Wang have proposed an idea that Convolution Neural Networks (CNN) model can be used to predict the financial market movement. The authors of this paper have used the trading data from January 2010 to October 2017. They have showed that CNN model can effectively extract more generalized and informative features than traditional technical

indicators and can achieve more robust and profitable financial performance than previous machine learning algorithms.

- Sheikh Mohammad Idrees, M. Afshar Alam, Parul Agarwal have proposed an idea that Auto Regressive Integrated Moving Average (ARIMA) can be used for prediction of stock market movement. In this paper the authors have explained how the time series data can be helpful to understand the concept of the stock market prediction. They have suggested that ARIMA approach can be good enough for handling the time series data, and can be very constructive in real world problems.
- Dou Wei has proposed an idea on a variety of neural network prediction and Long Short-Term Memory (LSTM) neural network for the prediction of stock market. The result of this paper shows that LSTM neural network has some limitations like time lag of prediction, but with an attention layer it can predict stock market prices. In this paper the author has used a large batch of data to get the correct result of the stock market. For small batch of data, a descent algorithm can be used for prediction.
- Jeevan B, Naresh E, Vijaya Kumar B P and Prashanth have proposed an idea that using Long Short-Term Memory (LSTM) and Recurrent Neural Network (RNN) we can predict the Stock Market. In this paper they have recommended to use machine learning algorithms for prediction of stock market as it can predict the price close to the actual price. They have also said that the changing prices in stock market might be a variable that will not follow the same cycle for all the companies.
- Sumeet Sarode, Harsha G. Tolani, Prateek Kak, Lifna C S have proposed an idea that using the price prediction based on historical and real-time data along with news analysis, Long Short-Term Memory can be used to predict the stock market prediction using this data. The result will be

more accurate and it analyses the future prediction also.

### III. METHODOLOGY

Stock Market prediction is a complex problem as there are many issues that have to be taken care of statistically. But by proper use of machine learning algorithms, one can relate previous data to the current data and train the machine to learn from it and make appropriate assumptions.

The paper is mainly focusing on the following objectives.

- a) To predict the Stock Market, we will be using the data of the stocks from 2003 to 2019 of several companies. Then we will be checking the change in the prices of the stocks from time to time so we can get to know about how many percent the share has been gone low or high. After checking all the prices, we will check the daily returns of the stock so that we can get to know how much profit that company is getting from a product. This will help us gain the information about the changes in the stock of that company. We will find the moving average of the various stocks, as a single company doesn't have a single product, we will check which product is giving more profit. After these steps we will check the interrelation and correlation of the stocks. It means that if a product fails what will happen and what will happen if the product gives more profit. Using all the data of the given steps we will check the risk factor. Risk factor will tell us how much percent of risk is there. Finally, we will plot a graph that shows the current stock and the future stock.
- b) To do all these steps we will be using the Python programming language to code the above steps and we will be using the Machine learning algorithms to process all these steps. LSTM algorithm will be used to give the correct prediction of the Stock Market.

- c) To read all the data of the stocks from the span of 2003 to 2019 we will be using pandas which will be easy for the machine to access the data easily. We will also be using NumPy for the numerical calculation of the stocks so that we can know how many percent of profit or loss has happened. Finally, MATLAB to plot the graph of the current stock market and the predicted stock market.

#### IV. RESULT AND DISCUSSIONS

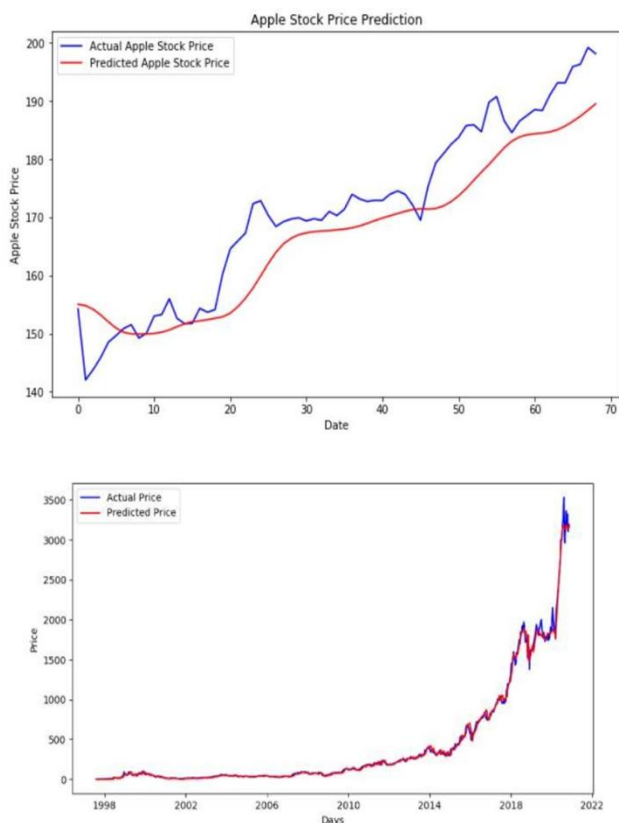


Fig. Stock Price Prediction

#### V. CONCLUSION

This paper talks about the prediction of stock market prediction using the LSTM model. Based on the various analysis and comparisons of algorithms some of them were intended for small data and some of the algorithms were for a cluster of data. The key factor of selecting this algorithm is because it can be used for both small data and big cluster of data and the accuracy rate of using the LSTM algorithm is high.

According to all the studies in the literature survey we decided to go with the LSTM model and take a big cluster of data for the prediction of stock market. The LSTM model can give correct accuracy and there will be no loss in any investment of the investor.

Later on, the exactness of the securities exchange forecast framework can be additionally improved by using a lot greater dataset than the one being used at present. Besides, other arising models of Machine Learning could likewise be read to check for the exactness rate came about by them. Supposition examination however Machine Learning on how news influences the stock costs of an organization is likewise an extremely encouraging zone. Other profound learning- based models can likewise be utilized for expectation purposes.

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