

Prediction of Stock Prices Using Machine Learning Techniques

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ABSTRACT: Stock Market Prediction is a platform where an enormous amount of data exists and constantly needs to be scrutinized. Traditional stock market prediction models is based on analysis of historical market data. Stock Market Prediction on basis of public sentiments based on social media. Positive tweets and news in social media encourage people to invest in the stocks of the company, thereby increasing the stock price of the company. Data sets are so large that it is difficult to analyze them using traditional data processing applications. Here we are going to determine the financial value of a company or other financial instrument traded on an exchange. Successful prediction of a stock's future price could yield significant profit.

KEYWORDS: Stock Market, Datasets, Data Preprocessing, Stock, Machine Learning.

I. INTRODUCTION

Stock market prediction is the act of trying to determine the financial value of a company or other financial instrument traded on an exchange. Successful prediction of a stock's future price could yield significant profit. Prediction methodologies fall into three broad categories which can overlap such as Fundamental analysis, Technical analysis and Technological methods. Traditional short term stock market prediction models are usually based on analysis of historical market data. Later studies have debunked the approach of predicting stock market movements using historical prices. The efficient market hypothesis (EMH) states that financial market movements depend on news, current events and product releases. Twitter is a micro-blogging application that allows users to follow and comment other users' thoughts or share their opinion in real time. More than a million users post over 140 million tweets per day. The most prominent technique involves the use of artificial neural networks (ANNs), Genetic Algorithms (GAs) and Sentimental Analysis.

II. RELATED WORK

Yaojun Wang, Yaoqing Wang Using Social Media Mining Technology to Assist in Price Prediction of Stock Market (2016) Sentimental analysis of Twitter data has been implemented using the methods of natural language processing (NLP) using Text Blob to get the sentiment of public on stock of particular company. We came to reference that we can predict the price of a particular stock for a given date using Long-Short-Term-Memory (LSTM) and neural network, and we will visualize using High-Charts.

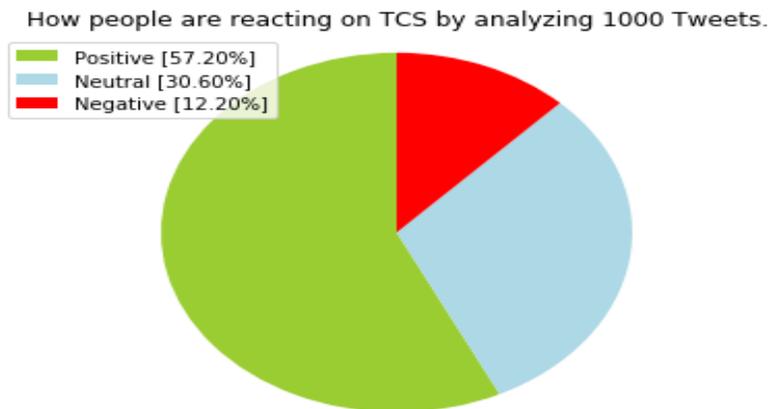
Takashi Kimoto and Kazuo Asakawa Computer based Systems Laboratory FUJITSU Laboratories Ltd., Japan proposed buying and selling timing prediction system for stocks on the Tokyo Stock Exchange and analysis of intenal representation. The prediction system achieved accurate predictions and the simulation on stocks trading showed an excellent profit.

Ramon Lawrence, Department of Computer Science University of Manitoba ,his paper is a survey on the application of neural networks in forecasting stock market prices. With their ability to discover patterns in nonlinear and chaotic systems, neural networks offer the ability to predict market directions more accurately than current techniques. Common market analysis techniques such as technical analysis, fundamental analysis, and regression are discussed and compared with neural network performance. Also, the Efficient Market Hypothesis (EMH) is presented and contrasted with chaos theory and neural networks. This paper refutes the EMH based on previous neural network work.Finally, future directions for applying neural networks to the financial markets are discussed.

III. METHODOLOGY

The price can be predicted by following ways:

- **Moving Average:** In moving average method, the predicted value will be the mean of the previous N values. This means we set the current adjusted closing price as the mean of the adjusted closing price of the previous N days. The hyper parameter N needs to be turned.
- **Linear Regression:** Linear regression is a linear approach to modeling the relationship between a dependent variable and one or more independent variables. By using linear regression we can fit a linear regression model to the previous N values, and use this model to predict the value on the current day.
- **Long Short Term Memory (LSTM):** LSTM is a deep learning technique and was developed to combat the vanishing gradients problem encountered in the long sequences. LSTM has three gates they are the update gate, the forget gates and the output gates. The update and forget gates determine whether each element of the memory cell is updated. The output gate determines the amount of information to output as activations to the next layer.
- **Sentimental analysis:** Here is an example of sentiment analysis of TCS company stock. This is a real time plot and does not collide with historic data ,the sentiments are used to understand the company’s moral in the society.



IV. EXPERIMENTAL RESULTS

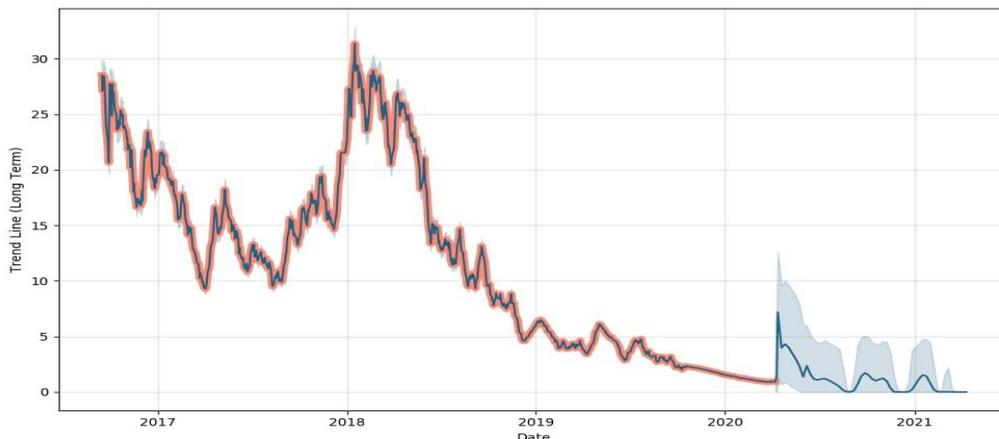


Fig.1 : Prediction for the year of 2020-Airtel

In the above graphs the blue line is plotted from actual values and red line is the line plotted from the predicted values. This is done only using the predicted values.

V. CONCLUSION

In our project, we are able to predict the price and sentiment of an individual towards a particular company stock. By this, we are able to bring profit to the investment made on a stock. Stock market is unpredictable, many factors affect the price of the stock so our project is able to predict with only definite number of accuracy.

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