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Indian Stock Market Predication Using Machine Learning

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ABSTRACT

The stock market is a highly volatile, non-deterministic system with a large number of variables impacting trend direction on numerous sizes and layers. According to the Efficient Market Hypothesis (EMH), the market is efficient unbeatable. This makes predicting whether the market is in an upswing or decline extremely difficult task. The goal of this study is to merge several existing strategies into a new one a more robust prediction model that can handle a variety of circumstances Investing can be advantageous. Techniques such as sentiment analysis and sentiment mining are already in use. Techniques based on neural networks can be excessively narrow in scope, which can lead to problems. erroneous results in a variety of scenarios This is achieved by combining both strategies More accurate and adaptable recommendations can be provided by a prediction model. Embedding The investor will be guided by technical indications to reduce risk. and you will get greater results. In this paper we have predicted the price using LSTM

Key Words: LSTM.

INTRODUCTION

A successful stock forecast can result in large gains for both the seller and the broker. It is frequently brought up. That prediction is chaotic rather than random, which implies it is more likely to be accurate can be predicted by thoroughly examining the past performance of corresponding stock market Machine learning is a useful tool a method of representing such processes It calculates a market value nearer to the tangible value, which improves precision. Machine learning is being used to the stock market for the first time. Because of its usefulness, prediction has piqued the interest of numerous researchers. measurements that are both efficient and precise.

The dataset used in machine learning is crucial Because even minor changes in the data might result in large changes in the results, the dataset should be as precise as possible. On a dataset taken from Yahoo Finance, supervised machine learning is used in this study. The following five variables make up this dataset: open, close, low, high, and volume. Different bid prices for the stock at different times with virtually direct names are known as open, close, low, and high. The number of shares that passed from one owner to another over the time period is the volume. After that, the model is put to the test with the test data.

RELATED WORK

According to the literature review, the use of machine learning techniques to stock market prediction is being done extensively all over the world. In comparison to current prediction methodologies, Machine Learning techniques have proven to be substantially more accurate and faster.

In [2, Mehak Usmani et al proposed an intuitive idea of combining results from historical data, news, and sentiment analysis from Twitter feeds. This two-pronged strategy accurately forecasts the stock market trend. To determine the market trend, it employs technical analysis such as ARIMA and SMA. These models forecast values using mathematical models that have been demonstrated to work. Other factors such as depreciation and currency rates are taken into account in this study. This study uses technical analysis for prediction, which has been shown to be less accurate than machine learning. Machine learning is better at dealing with noise and a lack of information. This method may be inaccurate in market conditions not covered by the training data.

Rodolfo C. Cavalcante et al work's in [3] improves on previously existing trading rules and delivers better results than previous studies. To boost the market, this study employs a variety of tried-and-true market methods a real-time self-driving trader This study concentrates on short-term gains. Excellent for trading without having to touch the computer. Trading generates a lot of revenue for their model. Improvements can be achieved on choosing more in small time frames (minutes) features, as well as making it more adaptable.

Paul D. Yoo et al. study the effectiveness of machine learning models and event-driven models such as sentiment analysis in predicting stock market changes in [4]. It also highlights the fact that macroeconomic factors such as the International Monetary Fund (IMF) and the Federal Reserve (FED) have a significant impact on Political events have an impact on market patterns and must be considered.

According to Alexander Porshnev et al in [5,] adding twitter sentiment analysis to the prediction model adds no useful information and does not improve accuracy. As a result, news feeds are used in this study to lend credibility to sentiment analysis.

Dongning Rao et al research.'s [6] provides excellent insight into how to properly apply sentiment analysis. With each test, they recommend expanding the size of the corpus (training data). This is accomplished by including non-polarizing terms from the test data that aren't contained in the corpus. As a result, with each succeeding test, the training data becomes more efficient.

The data is subjected to Linear Regression [6]as governed by the aforementioned equation, and then relevant predictions are created. Low, open, high, close, and volume were the variables examined in the regression. The confidence score was calculated using the R-square confidence test, and the predictions were plotted to demonstrate the results of stock market prices vs. time.

Deep neural network approaches were utilised by H. Gunduz, Z. Cataltepe, and Y. Yaslan [3] to predict stock values. Similarly, M. Billah, S. Waheed, and A. Hanifa [4] argued that neural networks may be utilized to enhance stock prediction using a training technique they invented. K. V. Sujatha and S. M. Sundaram [6] proposed practical ways for dealing with non-normal events that can occur during system operation and cause disruptions or incorrect predictions. Y. Liu and G. Liao.

METHODOLOGY

The goal of this project is to create an application that generates accurate, quantitative recommendations. Three modules have been implemented to achieve this goal:

- Module for Machine Learning
- Module for Sentiment Analysis
- Fuzzy logic Module

Module for Machine Learning

This module's goal is to generate a Stock Prediction value. The strength of the divergence between the starting and closing prices is the Stock Prediction value. To do so, we must forecast the stock's closing price. This is accomplished by using Machine Learning on historical stock data.

The following are the characteristics that must be present to accurately anticipate a stock's closing price on a given day.

1. Prediction day's opening price
2. Prediction day's lowest and highest prices
3. Simple Moving Average
4. Exponential moving average of the prediction day's opening and closing prices
5. Exponential moving average of the prediction day's lowest and highest prices
6. Bollinger Bands of the prediction day's beginning and closing prices
7. Bollinger Bands of the prediction day's lowest and highest prices

Module for Sentiment Analysis

The goal of this module is to get the sentiment value of the most recent news items about each stock and provide it to the fuzzy module as an average sentiment value.
The following are the steps utilized in this module:

1. Data collection:
   The information was gathered by crawling the website www.moneycontrol.com, which covers Indian financial news. A minimum of four news items are required. For each stock, headlines are scraped and saved against the company symbol.

2. Tokenization
   Each headline is broken down into sentences, which are then broken down further.

Module for Fuzzy Logic

This module's aim is to generate Stock Faith, which is the strength of Recommendation.
The following are the activation rules for this module:
If the news sensitivity was good or the stock predication was good, then the stock faith would be high.
If the value of the stock predication was medium, then the stock faith would be medium.
If the news sentiment was bad and the stock predication was bad, then the stock fidelity would be bad.

RESULT ANALYSIS

In this project, we were able to predict the data of stocks with the highest accuracy of 87% using LSTM algo. We have learned that market is very difficult to predict even with multiple algorithms executed simultaneously. As price is the collective action of all the events, emotions and news which cannot feed into any algorithm. This is the drawback of this study.

CONCLUSION

Using machine learning techniques, this article attempted to predict the future prices of a company's stocks with improved accuracy and reliability. The implementation of the innovative LSTM Model as a technique of determining stock prices is the researchers' key contribution.
Both strategies showed an increase in prediction accuracy, resulting in good results, with the LSTM model showing to be more efficient. The findings are encouraging, leading to the conclusion that machine learning techniques can be used to predict stock market movements with greater accuracy and efficiency.
The accuracy of the stock market prediction system can be increased in the future by using a much larger dataset than the one now in use. In addition, other developing Machine Learning models might be investigated to see what accuracy rate they produce. Sentiment analysis using Machine Learning to determine how news influences a company's stock prices is also a promising subject. Predictions can also be made using other deep learning-based models.

REFERENCES

K. Raza, "Prediction of Stock Market performance by using machine learning techniques," 2017 International Conference on Innovations in Electrical Engineering and Computational Technologies (ICIEECT), Karachi, 2017, pp. 1-1.

K. V. Sujatha and S. M. Sundaram, "Stock index prediction using regression and neural network models under non normal conditions," INTERACT-2010, Chennai, 2010, pp. 59-63.

M. Usmani, S. H. Adil, K. Raza and S. S. A. Ali, "Stock market prediction using machine learning techniques," 2016 3rd International Conference on Computer and Information Sciences (ICCOINS), Kuala Lumpur, 2016, pp. 322-327.

Hussain, A. J., Knowles, A., Lisboa, P. J., & El-Deredy, W. (2008). Financial time series prediction using polynomial pipelined neural networks. Expert Systems with Applications, 35(3), 1186–1199.

Kazem, A., Sharifi, E., Hussain, F. K., Saberi, M., & Hussain, O. K. (2013). Support vector regression with chaos-based firefly algorithm for stock market price forecasting. Applied soft computing, 13(2), 947–958.

Schumacher, R.P., Chen, H.: Textual analysis of stock market prediction using breaking financial news: the AZFin text system. ACM Trans. Inf. Syst. 27, 1–19 (2009)

R. C. Cavalcante and A. L. I. Oliveira, "An autonomous trader agent for the stock market based on online sequential extreme learning machine ensemble," 2014 International Joint Conference on Neural Networks (IJCNN), Beijing, 2014, pp. 1424-1431.
M. Tirea and V. Negru, "Text Mining News System - Quantifying Certain Phenomena Effect on the Stock Market Behavior," 2015 17th International Symposium on Symbolic and Numeric Algorithms for Scientific Computing (SYNASC), Timisoara, 2015, pp. 391-398.

S. Liu, G. Liao and Y. Ding, "Stock transaction prediction modelling and analysis based on LSTM," 2018 13th IEEE Conference on Industrial Electronics and Applications (ICIEA), Wuhan, 2018, pp. 2787-2790.

Guresen E., Kayakutlu G., and Daim T. U. (2011). ”Using artificial neural network models in stock market index prediction.” Expert Systems with Applications 38 (8): 10389-10397.

P. D. Yoo, M. H. Kim and T. Jan, "Financial Forecasting: Advanced Machine Learning Techniques in Stock Market Analysis," 2005 Pakistan Section Multitopic Conference, Karachi, 2005, pp. 1-7.

M. Tirea and V. Negru, "Text Mining News System - Quantifying Certain Phenomena Effect on the Stock Market Behavior," 2015 17th International Symposium on Symbolic and Numeric Algorithms for Scientific Computing (SYNASC), Timisoara, 2015, pp. 391-398.