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A Survey on Stock Price Prediction Using Deep Learning

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Abstract

Stock market price forecasts have been a topic that both analysts and researchers have long been interested in. Stock prices are difficult to analyse because of the excessive volatility nature that rest on many economic factors. Stock price forecasts based on historical data have proven to be inadequate. A study of sentiment analysis found a relationship between stock price movements and the publication of news articles. Many sentiment analyses use a variety of algorithms, such as support vector machines, naïve Bayesian regression, and deep learning, to look at how they are performed at different levels. The accuracy of the algorithm depends on the amount of training data provided. However, the amount of text information collected and analysed in previous studies is not yet sufficient and produces low-precision predictions.

In this paper, collect large amounts of time series data and use deep learning models to analyse related news articles to improve the accuracy of stock price forecasting. Naïve Bayesian classifiers are used to classify news texts with negative or positive emotions. Along with the number of positive and negative emotions in each day's news articles, and past data, close prices and distribution of adjacent days are used for predictive purposes and accuracy of 65.30 to 91.2% achieved in different machine learning technologies.

Keywords*: Stock market, support vector machines, Naïve Bayesian regression, deep learning, RNN*

I Introduction

There are many factors that affect the price of the stock market. One of the aspects is investors' responses to monetary news and daily events. Today, the accessibility of news is increasing dramatically. It is difficult for investors to determine stock price trends built on the basis of large amounts of news. Therefore, automated systems for predicting future stock prices are useful for investors. Automated systems collect pecuniary news allied to interested companies in real time and use historical stock quotes to run machine learning models to predict prices. Over the years, research has been conducted to predict stock prices based solely on historical stock data or using text and historical data.

Some of the previous works were used by Twitter as text data for emotions, financial blogs and news articles. Our job is to avoid fake news that may be widespread on social media with financial news stories from well-known sources. Using previous stock prices and existing financial news, we predicted the closing price of the day. We believe that financial news related to the company will have a significant impact on stock prices.

II Literature Survey

Below Table 1 shows the various papers survey based on the method

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III SYSTEM ARCHITECTURE

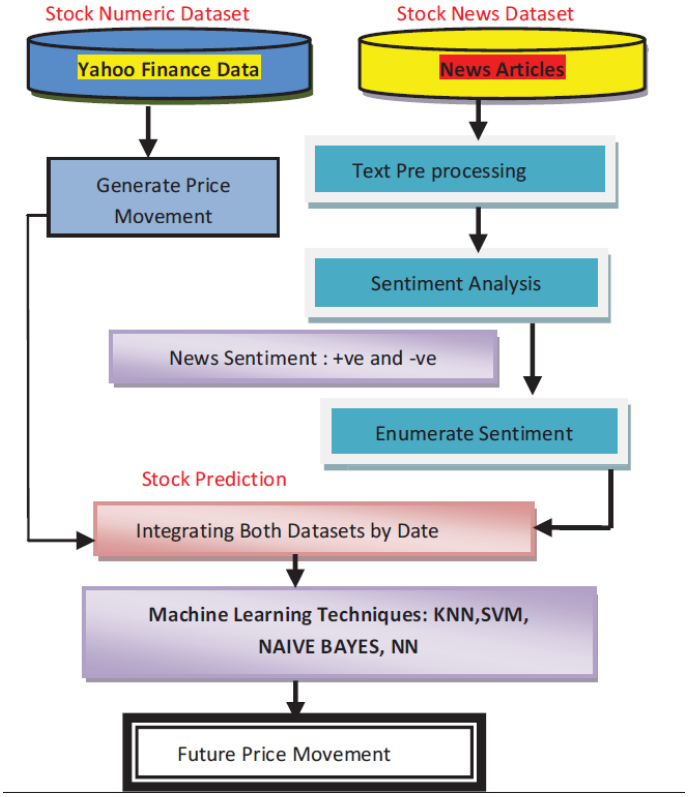

Fig. 1 Prediction Model for Stock Market

Serial	Year	Author	Concept	Method	Advantages	Disadvantages
1	2019	Saloni Mohan, Sahitya et.al	Our paper improves the accuracy of stock price forecasting. Collect large amounts of time series data and use deep learning models to analyse them in relative to news articles.	Deep Learning	We know better results in RNN. There is a correlation between text information and the direction of stock prices.	Model is Good execution in case If the stock price is Low or highly volatile.
2	2019	Sneh Kalra , Jay Shankar Prasad	This study focuses on observing stock price fluctuations in related news articles in companies. Also, it proposes a daily forecasting model using past data and news articles to predict the movement of the Indian stock market. Categorized Child	Deep Learning	The highest predictive accuracy realized by KNN is 91.2%. The results of the proposed method are	Deep learning usually requires much more data than it used to be Machine learning algorithms, as in the case of at

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			Naïve Bayes. Categorize news texts with negative or positive emotions.		consistent with previous studies that said there is a strong correlation between stock-related news and stock price changes.	least a few thousand people millions of labelled samples. This is not an easy problem. Many machines to deal With other algorithms, learning problems can be solved with less data.
3	2018	Ishita Parmar, Navanshu Agarwal, Sheirsh Saxena, Ridam Arora, Shikhin Gupta, Himanshu Dhiman	This paper Regression the Use of LSTM-Based Machine Learning Predict stock prices. Factors to be considered are open, closed, low, High and volume.	Machine Learning	Primary Contributing researchers to make their applications New LSTM model as a means of determining stocks Price.	The accuracy of Stock Market Forecasts System more possible improved by taking advantage of Much larger dataset more than there is It is currently in use.
4	2018	Jeevan B, Naresh E, Vijaya kumar B P, Prashanth Kambli	This paper is mainly based on a method to predict stock prices using long-term short-term Memory (LSTM) and Recurrent Neural Network (RNN) Use a variety of data to predict the stock price of NSE data Factors such as current market price and price rate of return Includes basic values and other events.	Machine Learning	As a result, you can predict the stock price to a very close value. At the actual price, this model captures the hidden model Use different strategies to work and make predictions.	The first drawback RNN slope is Gone. Problems exploding. That Do the training for RNN is difficult Two ways: (1) It can't Very long processing Sequence if used

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						tan as its activation function, (2) it's very Unstable when using As activation Function.
5	2017	Ashish Sharma, Dinesh Bhuriya, Upendra Singh	Make predictions Regression analysis is primarily used. In this paper, a study of a well-known and efficient regression approach to Predicting stock market prices from stock market data Base. Results of multiple regression in the future Approach can be improved using more and more Variable.	Machine Learning	As a result, stock prices can be very close to forecasting. At the actual price, this model captures the hidden model Use different strategies to work and make predictions.	First drawback RNN slope is Gone. Problems exploding. That Do the training for RNN is hard, in two How: (1) Cannot be processed Very long sequence use a tan as that Activation function, (2) Very unstable If you want to use relu as that Activation function.
6	2019	Dou Wei	This survey is based on the demand for stock prices. predictions and practical problems it faces, comparisons and We analyse various methods of neural network prediction, Finally, selected LSTM (long-term short-term memory, LSTM) Neural Network.	LSTM Neural Network	Primary Contributing researchers to make their applications New LSTM model as a means of determining stocks Price.	Predicted time The delay is have a certain effect on The validity of the model.
7	2019	Sayavong Lounnapha ,Wu	This paper proposes stocks	Convolutional Neural Network	The main advantage of convolutional	they lose completely

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		Zhongdong ,Chalita Sookasame	Price prediction model based on convolutional neural network, It has obvious self-adaptability and self-learning ability.		neural networks is that that we're using convolution and low sampling layer Learning function extractor, which allows to supply nerves This is useful because it is a network that does not perform advanced pre-processing. Features are learned during training. has high accuracy and high application values.	All internal data About poses The orientation of objects and they routed All information Same neurons You may not be able to do this. Of this kind of Information.
8	2017	Shashank Tiwari, Akshay Bharadwaj, Dr. Sudha Gupta	In this paper, proposes the use of data analysis. Help investors make the right financial forecasts The right decisions about investing can be taken by investors. 2 The platform is used for operation: Python and R.	Data Analytics	Feed forward neural The network provides the highest accuracy of the opening price Stock. We also observed that different methods are efficient	Cost of data Analysis tools vary Based on application and features Support. In addition Part of the data Analysis tools are Complex to use Training is required. This

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					for different types of stocks and prices.	increase the cost to company willing Adopt data Analysis tools or Software.

Table 1 Literature Survey

To improve the predictive accuracy of stock market movements, the proposed system cartels the difference in news sentiment values, historical data, and the closing price of adjacent days. The proposed model helps investors invest in the stock market and take various decisions to avoid financial losses and risks. This model predicts price fluctuations per day, taking into account fully available news and historical data[7 8]. Supervised machine learning technology is used to train existing data. News sentiment is mined and combined with the past price of the number to build the forecast model. In this study, we analyse the text of the news data and the polarity search of the text.

IV Conclusion

In this study, we used a time series to predict stock prices. Grouping models, neural networks, and financial news articles. The result is a strong relationship between stock prices and financial news articles. In this study, you can build a prediction model built on a time series. For example, RNN and Facebook prediction model prophets[9]. The way to build a stock forecast model is still different when the RNN achieves better results and consequently the stock price is low or very unstable, in the next stock direction model, there is a correlation between text information that the stock direction model did not work well. Some of these include building domain-specific models by grouping companies that they believe will adversely affect stock prices, and show general market stability, taking into account the company's more general industry and global news. News about other affiliates.

V FUTURE SCOPE

Future price fluctuation accuracy is improved by numeric sentiment values and historical numeric event data. KNN can achieve the highest predicted accuracy of 91.2%. The results of the research paper are finely consistent through previous studies that stated that there is a strong correlation between stock-related news and stock price changes. KNN datasets are considered to be the most commonly executed compared to other application algorithms. Future work can be taken into account by considering numerous cases of social media data, reviews, long-term blogs that affect the stock market, and news data.

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