



ENHANCED STOCK MARKET FORECASTING THROUGH MACHINE LEARNING TECHNIQUES

¹B.Subba Reddy,²V.Poojitha,³Sk.Annu,⁴S.Lalinya,⁵Y.Karthik

¹Professor,^{2,3,4,5}UG Scholar, Department Of ECE

^{1,2,3,4,5}N.B.K.R Institute of Science and Technology, Vidyanagar, Tirupati District, Andhra Pradesh, India

Abstract: The stock market is a subject of great interest to experts and the general public. Many laymen consider stock investing a risky activity, like trying to catch a falling knife, because they believe that price movements cannot be predicted. Experts say that the stock market works based on factors such as profits, losses, opening and closing prices, and the number of shares traded. They also show that stock markets show cyclical cycles, with periods of growth (bull market) and periods of decline (bear market). If people can predict these changes using today's technology, they will make a lot of money or lose it all. This is why there is an increasing interest in using machine learning to predict stock prices. By using machine learning algorithms to analyze historical data, we hope to more accurately predict future stock prices. This can help us make better investment decisions and increase profits while reducing risk. Machine learning models can analyze various factors that influence stock prices, such as company earnings, market trends, and economic indicators. By understanding these trends, we can better predict when stock prices will rise or fall. Data quality, interpretation of results, and legal issues are important considerations. However, with careful observation and continuous improvement, machine learning can change the way we invest in the stock market.

I. INTRODUCTION

Stock exchange rate fluctuations, in part, reflect the global economic environment—whether it's growing or declining. Some veteran stock traders question the reliability and accuracy of new machine learning methods for predicting stock prices, saying that the complexity of the stock market negates the possibility of reliable predictions. . In fact, previous studies have proven the effectiveness of these machine learning models. In order to predict the chances of an early sell or sell action, researchers have developed a variety of hybrid models that attempt to predict candle chart trends for individual stocks. Previous successful applications of machine learning methods to other time-series forecasting problems show their great promise for stock market analysis. Previous researchers have used support vector machines (SVM) and neural networks to predict price trends not only in the stock market. These characteristics determine the overall effectiveness of the forecasting model, so previous studies on the use of machine learning strategies for stock price forecasting have mostly focused on the characteristics of historical stock data. To collect and analyze the impact of public and private information, researchers have tried to use textual information from social media, news, and official company announcements. Information from various resources is fed into a machine learning system. On the other hand, the models involved in implementing deep learning may differ from this structure, and all these components may be included in an end-to-end training model. In recent years, the

success of deep learning has not only achieved remarkable results in many computer vision tasks, but also achieved remarkable achievements in natural language processing. Also, in recent years, researchers have applied deep learning to various tasks. Basic machine learning techniques in the early years manually created features that were then used for classification and regression. However, the performance of these methods depends on the quality of the features created. If the quality of the feature creation is poor, it will have a negative effect on the classification or the reduction process. Fortunately, deep learning can solve this problem. Through deep neural networks and nonlinear transformations, models can automatically learn behavior based on multiple parameters. The fact that deep learning is so good at providing accurate predictions has drawn the world attention to the potential of this technology. Overall, if conducted properly, deep learning can be very useful in various academic and industrial researches, thus adding value to the human world. Although researchers have successfully used deep learning techniques such as GNN, GRU, and LSTM to complete forecasting tasks, a comprehensive review of stock price forecasting activities is still lacking. Therefore, in this paper, the background related to this work is presented first, including its sub-tasks, as well as the datasets and variables it uses. We will introduce some new neural network models used in each work, as well as the principles of those models. In addition, we review some recent studies and indicate the issues and approaches that this work focuses on. Finally, based on the analysis of previous work, we propose some challenges that may be encountered in the work. Our review can provide a good guide for beginners.

II.LITERATURE SURVEY:

1.Stock Price Forecasting Using Data From Yahoo Finance and Analysing Seasonal and Non seasonal Trend

Determining the relationship between various current time-series variables (ie ARIMA and Holt Winter) and stock prices is the main focus of the work presented in this paper. For an investment, the

optimal range of risk-free returns is analyzed, so the value is better when the accuracy of the model is proven. In order to find the best returns for shares on the stock market, a combination of two different time series analysis models was chosen to generate stock prices. The main advantage of these models is that they are not complicated and determine the value based only on the prices of non-seasonal or seasonal stocks. In this test, some of the limitations are that the study did not take into account other factors, such as news about new market strategies and press releases for a company that can affect stock prices.

2.Multi-Category Events Driven Stock Price Trends Prediction

In this paper, [2] multi-category news events are used as features to develop stock price trend prediction, model. The multi-category events are based on already defined feature word dictionary. And we have employed both neural networks and SVM models to analyse the relationship between stock price movements and specific multi-category news. Experimental results showed that the predefined multi-category news events are more improved than the baseline bag-of-words feature to predict stock price trend. As compared to long term prediction, short term prediction is better based on this study.

3. Share Price Prediction using Machine Learning Technique

Most of this article [3] is based on a stock price forecasting method using long short-term memory (LSTM) and recurrent neural network (RNN), using various features such as current market price and price to predict stock value based on NSE data. Analyze the performance of your model by comparing actual data with predicted data using RNN graphs. Machine learning predicts stock prices because the model is able to predict stock prices close to the actual price, the model captures detailed trends and uses predictive strategies different. Conduct sample training for all NSE resources from the Internet, identifying entries and grouping them, and providing entries based on user configuration. The data is collected and classified by a random method to avoid merging data.

4. Share Price Trend Prediction Using CRNN with LSTM Structure

The [4] entire financial market majorly runs One of the most interesting research problems in the stock market is predicting stock price fluctuations. Use historical stock data to predict future stock prices and deep learning techniques to find the approximate values of the stock price trends mentioned in this article. This article not only stores historical stock data and time scale, but also estimates future stock prices through a built-in neural network, because the meaning of the Stock trends are linked to historical stock price information. The neural network design proposed in this article uses convolutional recurrent neural networks (CRNN) and long-term memory and short-term memory (LSTM) to improve the long-term reliability of the traditional RNN as the main component. Tests were performed with an average error rate of 3.449 RMSE. [3]

III.EXISTING SYSTEM:

Stock price forecasting using machine learning can now estimate future stock values, and current performance can be done using machine learning techniques such as LSTM. These machine learning algorithms are designed to make good predictions about future stock prices. LSTM can capture changes in stock price behavior over a period of time in this system of reasoning. proposed [3] comparison of stock price forecasting based on machine learning. The dataset used for the analysis was selected from Yahoo Finance. It contains approximately 900,000 stock price records and other related data. The data shows stock prices at certain times for each day of the year. There are many data such as date, indicator, opening price, closing price, lowest price, highest price and trading volume. Data from any company is considered here. All data was sent as a CSV format file, which was first read and converted into a database using the Pandas library in Python. The data was processed using the sklearn library in Python and divided into a training set and a test set.

IV.PROPOSED METHODOLOGY:

The aims of this project are as to identify factors affecting share market, To generatethe pattern from large set of data of stock market for prediction of NEPSE and to predict an approximate value of share

price to provide analysis for users through web application.The objective of the system is to give a approximate idea of where the stock market might be headed. It does not give a long term forecasting of a stock value. There are way too many reasons to acknowledge for the long term output of a current stock. Many things and parameters may affect it on the way due to which long term forecasting is just not feasible.Attribute such as: price of open, high, low, close, adjusted close price taken from huge dataset are fed as input to the models for training to pre-process the data techniques like normalization & one hot encoding in applied on dataset. After this data is divided in two sets namely training & testing which are ratio of 80:20 respectively. Then, this set are used to train a model using 3 different approaches: LSTM, CNN and Hybrid approach of LSTM+CNNs. Finally, all these modules are evaluated using Root mean square error.

MODULE DESRRIPTION:

Data Preprocessing:

The entries are present in the dataset. The null values are removed using `df = df.dropna()` where `df` is the data frame. The categorical attributes (Date,High,Low,Close,Adj value) are converted into numeric using Label Encoder. The date attribute is splitted into new attributes like total which can be used as feature for the model.

Feature selection:

Features selection is done which can be used to build the model. The attributes used for feature selection are Date,Price,Adj close,Forecast X coordinate , Y coordinate, Latitude , Longitude, Hour and month,

Building and Training Model:

After feature selection location and month attribute are used for training. The dataset is divided into pair of `xtrain` ,`ytrain` and `xtest` , `y test`. The algorithms model is imported from sklearn. Building model is

done using model. Fit (xtrain, ytrain). This phase would involve supervised classification methods like linear regression, Ensemble classifiers (like Adaboost, Random Forest Classifiers), etc.

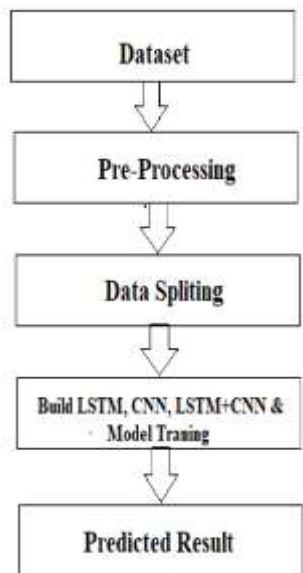
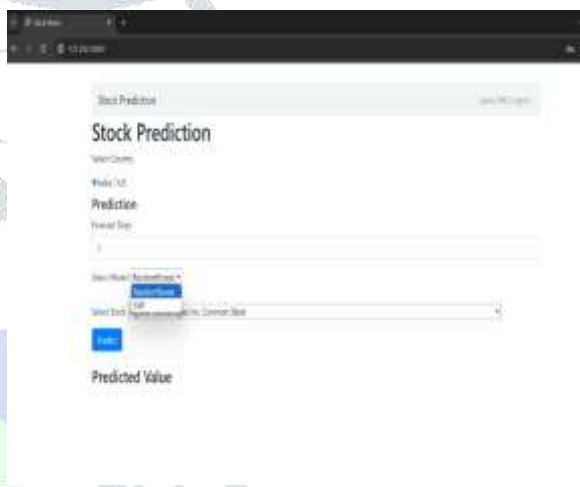
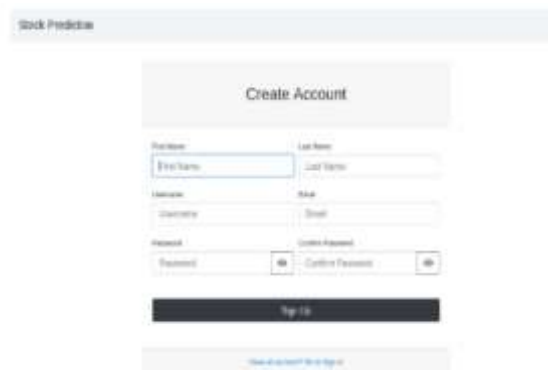


Fig 1:Block diagram

V.RESULTS:



VI.CONCLUSION:

By measuring the accuracy of regression algorithms, we find the best algorithms to predict stock market prices based on various data points in historical data. These algorithms can be a great asset for traders and investors who invest in the stock market as they are trained on a large amount of historical data and choose after testing the sample data. This project demonstrates that machine learning models can predict stock values more accurately than previously implemented machine learning models.

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