**Mini Project Report on**



**Machine learning model for stock value prediction**



**Submitted in partial fulfillment of the requirement for the award of the degree of**

**BACHELOR OF TECHNOLOGY**

**IN**

**COMPUTER SCIENCE & ENGINEERING**

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**January 2023**



**CANDIDATE’S DECLARATION**

I hereby certify that the work which is being presented in the project report entitled **“Machine learning model for stock value prediction”** in partial fulfillment of the requirements for the award of the Degree of Bachelor of Technology in Computer Science and Engineeringof the Graphic Era (Deemed to be University), Dehradun shall be carried out by the under the mentorship of **Dr. Sharon Christa, professor** , Department of Computer Science and Engineering, Graphic Era (Deemed to be University), Dehradun.

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**Introduction**

* 1. **Introduction**

A machine learning model for stock value prediction using LSTM (Long Short-Term Memory) is a type of recurrent neural network that is trained to analyze and predict time series data, such as stock prices. The LSTM model is trained on historical stock price data and uses this information to make predictions about future stock prices. The model can be trained on a variety of different features, such as historical prices, trading volume, and news articles, to improve its accuracy. Once trained, the model can be used to make predictions about future stock prices, which can be used for investment decisions and risk management.

**Ch-2**

**Literature Survey**

There have been many studies on using machine learning models for stock value prediction. Some popular models include:

Artificial Neural Networks (ANNs) - These are a type of deep learning model that are inspired by the structure and function of the human brain. They have been used to predict stock prices with varying degrees of success.

Support Vector Machines (SVMs) - These are a type of supervised learning model that can be used for classification and regression tasks. They have been used to predict stock prices by identifying patterns and trends in historical stock data.

Random Forest - It is an ensemble learning method for classification, regression and other tasks, that operate by constructing a multitude of decision trees at training time and outputting the class that is the mode of the classes (classification) or mean prediction (regression) of the individual trees.

Gradient Boosting - It is an ensemble method that combines multiple weak models to produce a strong model. It has been used to predict stock prices by learning from historical stock data and identifying patterns and trends.

LSTM (Long Short-Term Memory) - These are a type of Recurrent Neural Network that can capture long-term dependencies in time-series data. They have been used to predict stock prices by analyzing historical stock data and identifying patterns and trends.

These are some of the popular machine learning model used for stock value prediction, but there are many other models and approaches being developed and used in this field.

**CH-3**

**Methodology**

The methodology for using machine learning models to predict stock prices typically involves the following steps:

1.Data collection: The first step is to collect historical stock data, such as the opening and closing prices, trading volume, and other relevant financial indicators.

2.Data preprocessing: The collected data is then preprocessed, which includes cleaning the data, handling missing values, and normalizing the data to ensure that all variables are on the same scale.

3.Feature selection: The next step is to select relevant features that will be used as inputs for the machine learning model. This can be done using techniques such as correlation analysis, mutual information, or feature importance.

4.Model selection: Once the features are selected, the next step is to select an appropriate machine learning model. The model selection should be based on the characteristics of the data, the size of the dataset, and the complexity of the problem.

5.Model training: The selected model is then trained on the preprocessed data using the selected features. The training process involves optimizing the model's parameters to minimize the error between the predicted and actual stock prices.

6.Model evaluation: After the model is trained, it is evaluated on a hold-out dataset to assess its performance. The evaluation should include metrics such as accuracy, precision, recall, and F1-score.

7.Model deployment: If the model performs well on the evaluation dataset, it can then be deployed to make predictions on new, unseen data.

It is important to note that this process is iterative and may require tuning and refining the model, features, and parameters to achieve the best performance. Additionally, it is also important to monitor the model's performance over time, as stock prices are affected by many unpredictable factors that may change over time.

**CH-4**

**Result and Discussion**

The results of using Long Short-Term Memory (LSTM) models for stock value prediction can vary depending on the specific dataset and evaluation metric used. LSTMs have been found to be effective at capturing long-term dependencies in time-series data and have been used to achieve good performance in stock price prediction tasks.

In general, LSTM models have been found to perform well in stock price prediction tasks due to their ability to capture long-term dependencies in time-series data. They can be trained on historical stock data and can identify patterns and trends in the data that are not visible using traditional methods.

However, it is important to note that stock prices are affected by many unpredictable factors such as political and economic events, and as such, it is challenging to make accurate predictions. Additionally, LSTM models may require a large amount of historical data to train and may not be able to accurately predict stock prices for newer companies with less data available.

In conclusion, LSTM models have been found to be effective for stock value prediction and have been shown to outperform other traditional machine learning models in some studies. However, it is important to keep in mind that stock price prediction is a challenging task, and LSTM models, like any other models, may not be able to achieve perfect results. It's also important to validate the model with different evaluation metrics and try to improve the performance by incorporating other external factors and financial indicators.

**CH-5**

**Conclusion and Future Work**

In conclusion, machine learning models, particularly those based on LSTM, have been found to be effective for stock value prediction. These models have been shown to be able to capture complex dependencies in time-series data and make accurate predictions of stock prices. However, it is important to keep in mind that stock price prediction is a challenging task and that the performance of these models can vary depending on the specific dataset and evaluation metric used.

For future work, there are several ways to improve the performance of machine learning models for stock value prediction:

1.Incorporating external factors: Incorporating external factors such as news, economic indicators, and social media sentiment into the model can help improve its performance.

2.Ensemble methods: Combining multiple models, such as LSTM and Random Forest, can help improve the performance of stock price prediction.

3.Hyperparameter tuning: Tuning the model's hyperparameters can help improve its performance and make it more robust.

4.Real-time prediction: Developing models that can make real-time predictions, rather than just predictions based on historical data, can be useful for investors and traders.

5.Incorporating other financial indicators: Incorporating other financial indicators such as moving averages, relative strength index, and Bollinger Bands can help to improve the predictions of stock prices.

Overall, the field of stock value prediction using machine learning is an active area of research, and there is still much to be done to improve the performance of these models and make them more widely accessible and useful for investors and traders.

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(**Published in:**[2015 IEEE International Conference on Big Data (Big Data)](https://ieeexplore.ieee.org/xpl/conhome/7347101/proceeding)

**Date of Conference:**29 October 2015 - 01 November 2015

**Date Added to IEEE *Xplore*:**28 December 2015

**ISBN Information:**

**INSPEC Accession Number:**15679536

**DOI:**[10.1109/BigData.2015.7364089](https://doi.org/10.1109/BigData.2015.7364089)

**Publisher:**IEEE

**Conference Location:**Santa Clara, CA, USA)

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