Forcasting and Pattern Analysis of Dhaka Stock Market using LSTM and Phrophet Algorithm

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Abstract— forecasting or predicting stock market price and the trend has been regarded as a challenging task because of its chaotic nature. The stock market is essentially a non-linear, non-parametric, noisy, and deterministically chaotic system because of liquid money, stock adequacy, human behavior, news related to the stock market, gambling, international money rate, and so on. In a country like Bangladesh, it is very difficult to find any prediction of the stock market especially the Dhaka stock market. Because its trends and forecasting depend on various factors. Understanding the pattern of the stock market and predicting their development and changes are research hotspots in academic and financial circles. Because financial data contain complex, incomplete, and fuzzy information, predicting their development trends is an extremely difficult challenge. Fluctuations in financial data depend on a myriad of correlated constantly changing factors. In this paper, financial product price data are treated as a one-dimensional series generated by the projection of a chaotic system composed of multiple factors into the time dimension, and the price series is reconstructed using the time series phase-space reconstruction (PSR) method. An RNN-based prediction model is designed based on the PSR method and long and short-term memory networks (LSTMs) for DL and used to predict stock prices and for predicting stock market data trend we use Facebook open-source model prophet The proposed and some other prediction models are used to predict multiple stock indices for different periods. A comparison of the results shows that the proposed prediction model has a higher prediction accuracy

Keywords—DSA, LSTM, RNN, Phrophet,Prediction,Trend analysis

I. INTRODUCTION

Stock matket is an area of various changes.and avoid the risk of the potential loss if very dengerous.especially when you work with time series data which will get affected by many factor especially in the case of dhaka stock market.Different machine learning method had come accross with different model to find out in this paper we use LSTM a neural net and Facebook opensource trend analysis program to find the trend and predict the data of the future, and trend analysis od Dhaka stock market data For this two model Deep neural net is used especially RNN which a type of neural net that can take the continious data learn for it and appy it to the future multiple model have been introduced w are going to use the LSTM model for future prediction and phrophet model for trend analysis.The target of sales forecasting is to help the organization to determine the demands of products and improve their strategy for the future. Our purpose is to create a stock price prediction model for especially Dhaka Stock Market. The resulting model is intended to be used as a decision support tool or as autonomous tools that predict the future value of the stock prices by analyzing the previous stock price data and the its trend

This study seeks the goal is to take time-series data, Feed the data to the Neural network model especially LSTM model, and be able to forecast out a specific value. Time series data is a continuous data statistical observations recorded over a specific period of time. This model will try to understand the pattern of continuous data by combining different methods and produce the best fit with the forcasting we also make weekly and yearly trend of the dhaka stock market. Regression models are the most known models used in the machine learning community and recently many researchers have examined their sufficiency in Neural network proposed method was better in most cases. we expect to obtain better results because both theory and experiments show that LSTM helps most if the errors in the individual regression models are not positively correlated

II. LITERATURE REVIEW

Many algorithms of data mining have been proposed to predict stock price. Neural Network, Genetic Algorithm, Decision Tree and Fuzzy systems are widely used. Pattern discovery is beneficial for stock market prediction and public sentiment is also related to predicting stock price. There is a certain correlation between them. Previous studies on stock price forecasting show the use of technical indicators with artificial neural networks (ANN) for stock market prediction One of the well-researched and most important algorithm in the field of Data mining is Association Rule Mining (ARM), Decision trees are excellent for making financial decisions

In [3]. Y. Yoon and G. Swales predict the stock market data based on Neural network Approach. They take both the quantitative and qualitative variables for decision making. They use a four-layer deep neural network. Their Neural network shows a higher performance 77.5% than the traditional MDA model but it has

some limitation in explaining the importance of the input parameter. The hidden unit is useful to extract the feature but it makes difficult to separate the contribution of the input parameter to the output value

In [4]. Ping-Feng Pai, Chih-Sheng Lin, used the autoregressive integrated moving average (ARIMA) model for time series forecasting. ARIMA model can't easily capture the nonlinear patterns so they Support vector machine (SVM) and neural net to capture the non-linear pattern of the time series data

In [5]. K. Mohan use Deep neural network approach for multivariate time series analysis. They obtain a very close fit during training and the model outperformed than othr model

III. METHODOLOGY

For dhaka stock market Prediction we use the LSTM model and The fbprophet model to predict and the trend analysisThe prediction has two different part first one is the prediction and second part is the trend analysis.

Time series data are taken by a variable over time (such as daily sales revenue, weekly orders, monthly overheads, yearly income, daily stock prices and tabulated or plotted as chronologically ordered numbers or data points. there are two fundamental ways, how time-series data are recorded. The first way, values are measured just for the specific time stamps, what may occur periodically, or occasionally according to concrete conditions, but anyway, the result will be a discrete set of values, formally called discrete time series. This is a very common case and frequently observed in practice.

Timeseries consist of four components:
 • Seasonal variations that repeat over a specific period such as a day, week, month, season, etc.
 • Trend variations that move up or down in a reasonably predictable pattern,
• Cyclical variations that correspond with business or economic 'boom-bust cycles or follow their peculiar cycles
• Random variations that do not fall under any of the above three classifications.

There are two main requirements of time series analysis:
 • Identification of the important parameters and characteristics, which adequately describe the time series behavior.
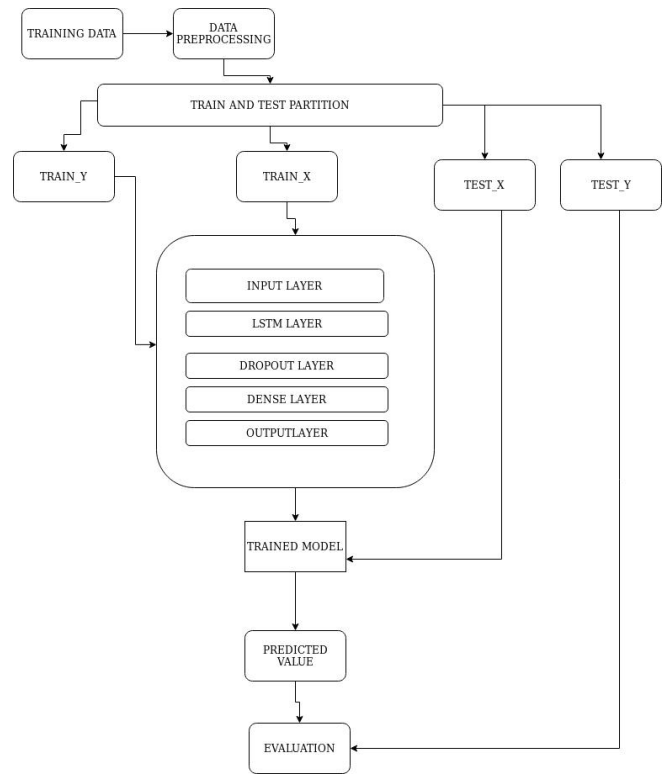• Identification of the best time series model.

Fig. 1 Proposed.Recurrent Neural Network

IV. LSTM

Long short-term memory (**LSTM) is** an artificial recurrent neural network (RNN) architecture used in the field of deep learning. Unlike standard feedforward neural networks, **LSTM** has feedback connections. LSTM is RNN that is used for analysis and prediction of time series data
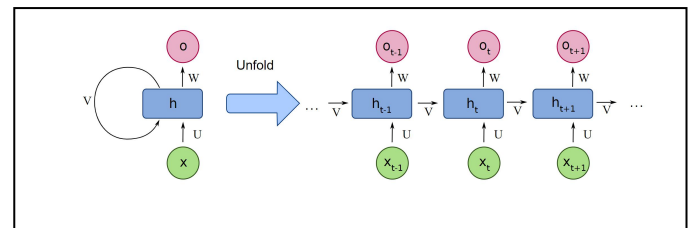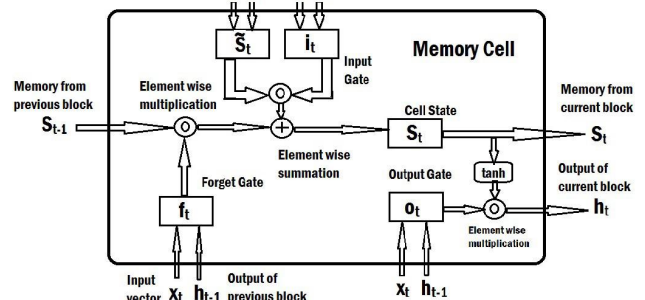

Fig. 2.Recurrent Neural Network

Fig. 3 LSTM network

V. EVALUATION

All the algorithm worked perfectly and This is the Result picture of the RNN and the Prophet trend analysis model
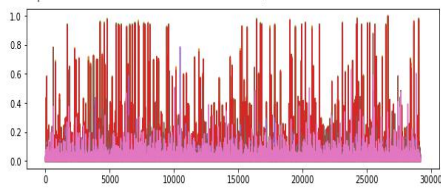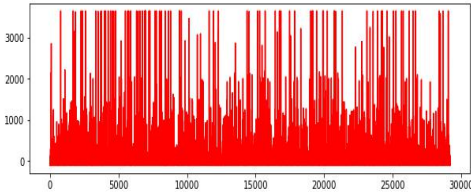

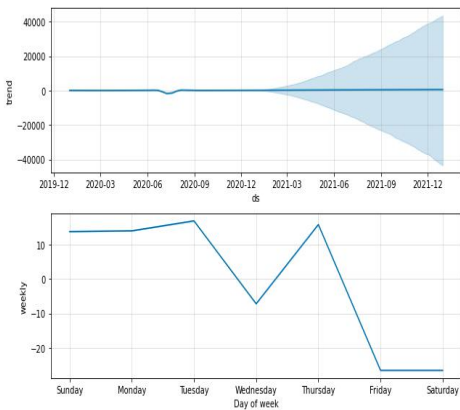Fig. 4 Tsted value

Fig. 5 predicted value

Fig. 6 weekly and yearly trend

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