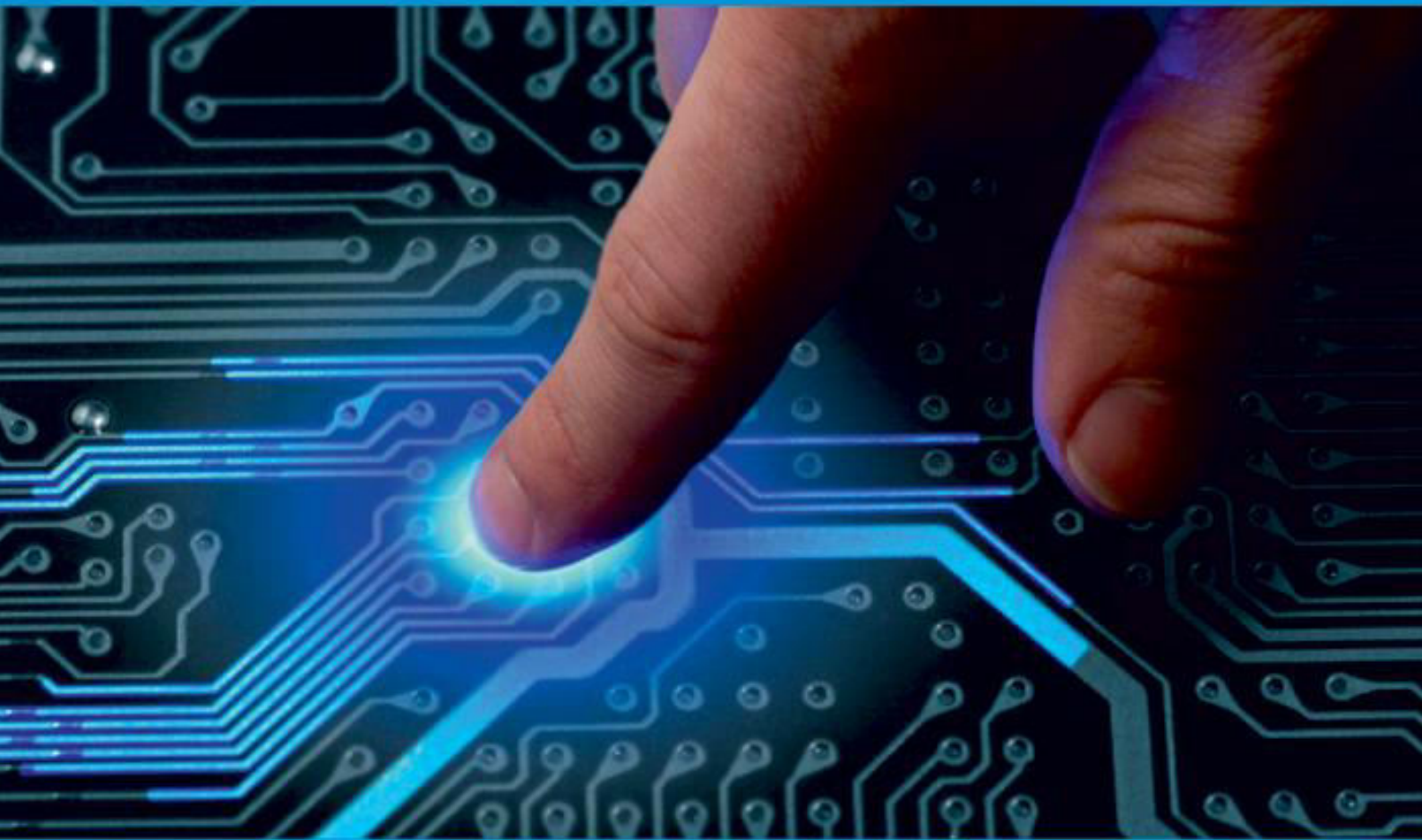




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Stock Market Analysis on Live Data

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ABSTRACT: The stock market is one of the most unpredictable and disturbing places on the planet. There is no fundamental way to predict stock prices. This is why people think that stock market forecasting is gambling. Current stock data values are based on real-time data, and stock data values change over time. Predicting the stock market and analyzing future stock values remains a challenge in research. The motivation of current research work is that the value of stock market data changes from time to time depending on the topic of risk. Therefore, we need to develop a computerized and automated method to predict stock market data values. Detailed information about the presence or absence of stock market volatility is determined by gathering information from past historical data to be used to predict strategic choices. The performance improvement of a newly developed machine learning classification procedure is analyzed through a benchmarking report to ensure accurate prediction of the proposed procedure. Using the machine learning classification algorithm LSTM, ARIMA and Linear regression, this feature can predict the development of stock prices and stock trends, provide recommended jobs and recommend them to users, allowing users to recommend which stocks for a long time.

KEYWORDS: Stock Price Prediction, Long Short-Term Memory, Stock Market

I. INTRODUCTION

The stock market is known for its volatility, randomness, and unpredictability. It's a chaotic place, with massive and ever-changing streams of data that make it very difficult to predict and profitably act on those predictions. This is one of the most difficult tasks in time series forecasting. The main objective of this study is to study deep learning techniques and apply them to the stock market to predict the behaviour of stocks, thereby reacting to these predictions to avoid investment risks and generate profits. The goal is to take advantage of pre-built neural network models using transfer learning. The predictions are then tested against actual historical stock price data. This research will be a useful tool aimed at helping novice traders make better decisions.

The stock market is one of the most unpredictable and disturbing places on the planet. There is no fundamental way to predict stock prices. The motivation for our project is that the value of stock market data changes from time to time based on risk themes. Therefore, we need to develop a computerized automatic method to predict stock market data values. Comparative analysis of different neural network forecasting methods and algorithms, LSTM (Long Short Term Memory) algorithm or ARIMA (Autoregressive Integral Moving Average) algorithm. We study and analyze the improved performance and prediction accuracy of the proposed method. With the help of these users, stocks to buy can be recommended for the long term.

II. LITERATURE SURVEY

The author[] analyzes historical stock market data and applies various machine learning algorithms such as regression analysis and neural networks to predict stock market trends. They also evaluated the performance of these algorithms by comparing their predictions to actual stock market trends. The authors report that their machine learning approach is effective in predicting stock market trends, with high accuracy rates for the algorithms tested. The article concludes that machine learning can be an invaluable tool for predicting stock market trends and helping investors make informed investment decisions.

The authors[] apply LSTMs to historical data for a specific stock and train the model to predict future prices based on past data. The article reports that LSTM models performed well in predicting stock prices, with high accuracy rates for the models tested. The authors also compared the performance of the LSTM model to other machine learning algorithms such as Support Vector Regression (SVR) and Random Forest (RF), and reported that the LSTM model outperformed these models. The authors conclude that LSTM models can be an effective tool for predicting stock prices and can help investors make informed investment decisions. The article also suggests that future research could investigate the application of LSTMs to other financial forecasting problems.

The authors[] uses a hybrid model which combines 2ML algorithms: ARIMA i.e (Autoregressive Integrated Moving Average) and LightGBM (Light Gradient Boosting Machine) to predict stock trends. ARIMA is used to model stock price time series data, and LightGBM is used for trend prediction based on the modeled data. The authors test the proposed hybrid model on real stock data and report that it outperforms traditional machine learning models such as ARIMA and LightGBM alone in predicting stock trends. This article also discusses the importance of feature selection in machine learning-based inventory trend forecasting and proposes a feature selection method based on correlation analysis. The authors conclude that the proposed hybrid ARIMA-LightGBM model is an effective tool for forecasting stock trends and can help investors make informed investment decisions. The author suggests that future research could investigate the application of the proposed hybrid model to other financial forecasting problems.

III. SYSTEM ARCHITECTURE

“The rich architecture of our solution could be separated into 3 parts. First is the selection of feature part, to guarantee the selected features are highly effective. Second, we look into the data and perform the dimensionality reduction. And the last part, which is the main contribution of our work is to build a prediction model of target stocks. Figure 1 depicts a high-level architecture of the proposed solution.”[6]

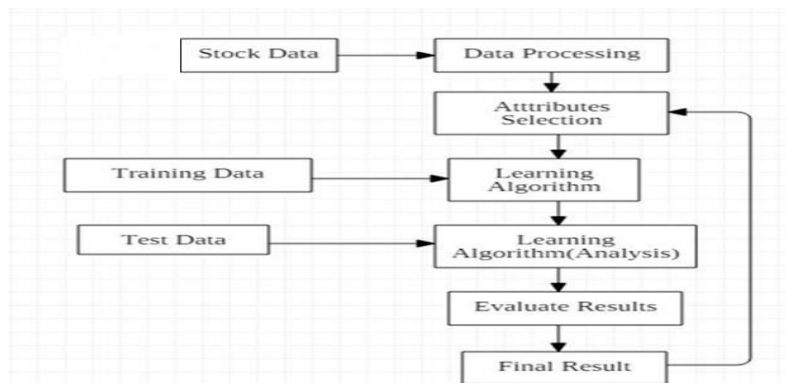


Fig 1: System Architecture

Prediction of the price correlation of assets for future is important in portfolio optimization. We use LSTM (RNN) to predict the price correlation coefficient of individual stocks. RNN’s are extremely competent in understanding temporal dependencies. The use of LSTM further enhances its long-term prediction properties. To use both linearity and nonlinearity in the model, we adopt the ARIMA model also. The ARIMA model filters tendency in the data and passes on the useful value to the ARIMA model. The ARIMA-LSTM model is tested against various predictive financial models like historical model, constant correlation, single-index and the multi-group. In our study, the predictive aspect of model turned out superior as compared to other models by a significant scale. Our work is worth considering the ARIMALSTM to forecast stock prices for portfolio optimization

In price forecasting, the ARIMA is one of the mostly used (Pai & Lin, 2005; Merh et al., 2010). ARIMA have proven their ability to give short-term predictions. In short-term prediction, it has consistently outperformed. The ARIMA model consists of steps like identification, estimation and diagnostic. ARIMA is based on AR and MA models. AR model is used to present that the current data is dependent on previous observations, the MA model shows that current and previous data compose a linear function. General statement for this model is ARIMA (p,d,q) where p is the degree of AR model, d is the degree of different order and q is the degree of MA model. The ARIMA (p, d, q) model takes the following order: (1) $\Delta d Y_t$ denoted a differenced dependent variable in time t, $\Delta d Y_{t-1}$, $\Delta d Y_{t-p}$ shows differenced dependent variables, c is constant, $\phi_1, \theta_1, \theta_q$ shows model parameters, ϵ_t is the useful term and ϵ_{t-1} , ϵ_{t-q} are the values of the residual.

Our very system first collects the stock data from yahoo finance using yfinance(a python package). Yfinance helps in gathering the live stock data and the data is then stored in excel sheet. After that data is pre processed which all the noise or missing values inn data is removed and then the appropriate data for prediction is taken and various prediction models are applied to obtain a prediction. The models that are applied are Linear Regression and ARIMA. Our system gives prediction of next 7 days based on the todays closing price.

IV. RESULT AND ANALYSIS

Some of the procedures impact the overall efficiency but they do not affect the overall accuracy or precision, while other processes may affect both, the efficiency and predicted result. To complete evaluate our algorithm, we have structured the evaluating part by main processes and evaluate how each of the procedure affects algorithm performance. We evaluated our very solution on a machine with 2.2 GHz i5 processor, with 8 GB of RAM.

The system captures the live data using yfinance and stores it an excel sheet. And the data stored is fetched my our algorithmic models in order to make the predictions. We have different models in order to balance our predictions and best fit predicted stock price. We show the actual price of stock and predicted price ove the period of time using a graph and also we give predictions for next 7 days. We also the the current trend in a particular stock so that user can easily get the track of the stock.

e.g we have taken an example of State Bank Of India(SBI) data and predicted its future price.



Fig 2: Trend in SBI stock price

In the fig 2 we can see the latest trends in the State Bank Of India(SBI) companies stock. SBI is a Goernment owned bank and it is the country's biggest bank with a market capitalization of more than 4 lakh crore. So, SBI is the stock that we have used to analyse our system's accuracy and working. There are numerous stock market prediction system's but there is not much system which makes prediction's using live data. Predicting stock price using live data turned out to be a differentiating factor for us. It was a tough job but after lots of research and hard work we were able to crack the way of designing a system which can make predictions using predictions using live data.

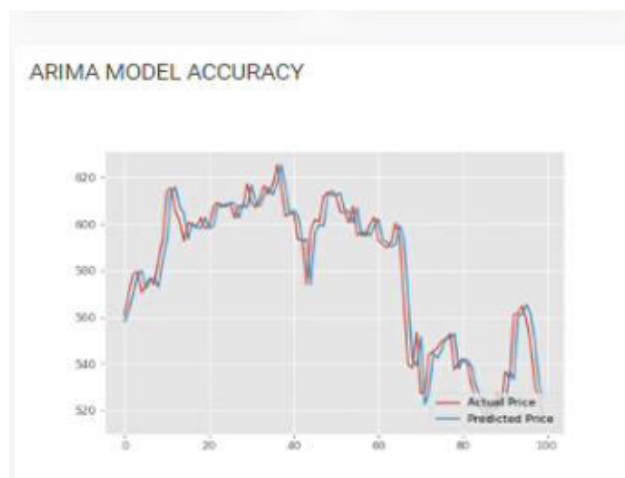


Fig 3: ARIMA Model Prediction

In the Fig 3 as you can see the actual price is plotted using red colour and predicted price is plotted using blue colour. It is our most accurate model which predicts the prices more accurately as compared to the remaining models that we have used.

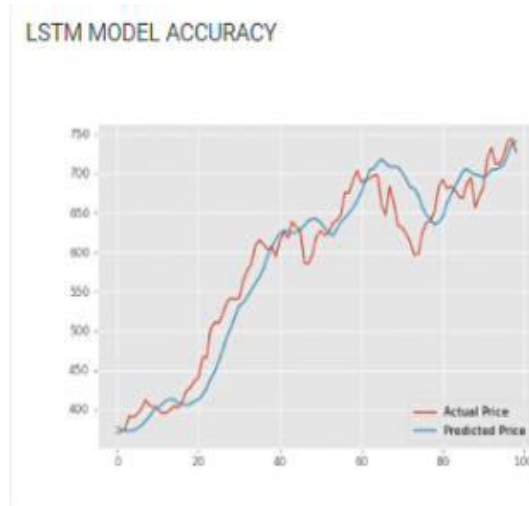


Fig 4: LSTM Model Prediction

In the Fig 4 as we can see the actual price and predicted prices are plotted and the accuracy is not as good as the ARIMA model.

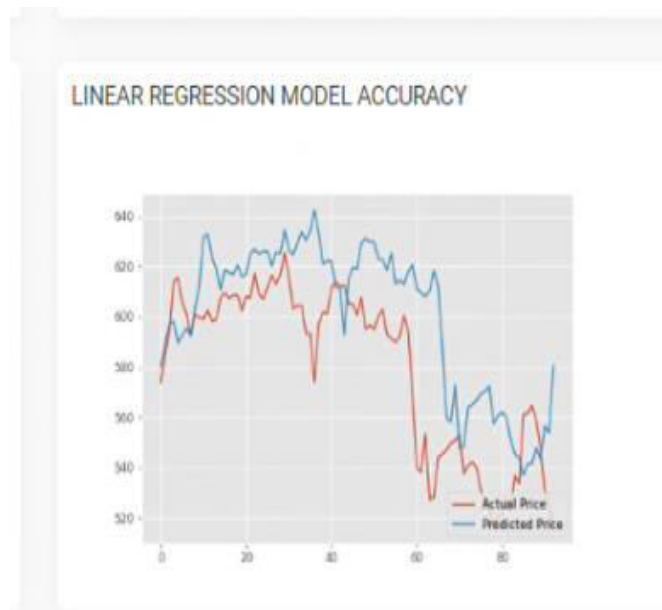


Fig 5: Linear Regression Prediction

In the Fig 5 as we can see it is least accurate model as compared to our other models.

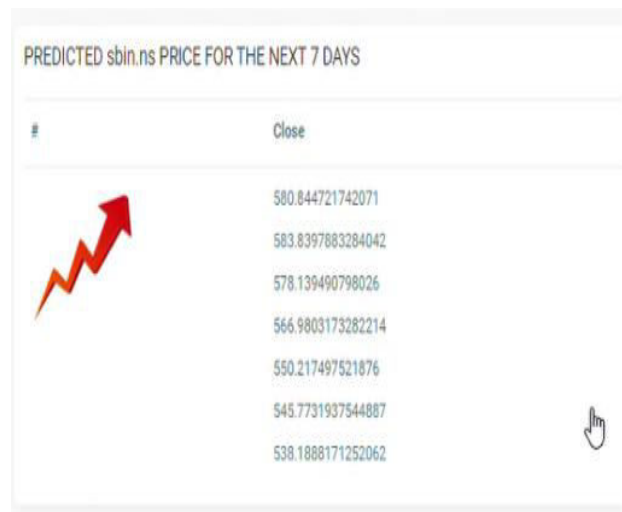


Fig 6: 7 days Prediction

In the Fig 6 we can see that the prediction of next 7 days is shown.

V. CONCLUSION

Three models have been used in this particular paper:

ARIMA, LSTM and LINEAR Regression, on the Yahoo finance dataset. All the three models have shown an improvement in actual accuracy of making predictions, thereby giving positive results. Using machine learning techniques in the prediction of stocks prices have given handsome results, hence marked them profitable. Which has led to conclusion that it is possible to predict stock market with more accuracy and efficiency using machine learning techniques. The stock market can be predicted using various models.

Stock Market Prediction can be improved by using much bigger of a dataset in near future.

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