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Predicting Stock Using Research and Value

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Abstract: *Investment firms, hedge funds and even individuals have been using financial models to understand market behavior better and make profitable investments and trades. Can we predict stock prices with machine learning? Investors make educated guesses by analyzing data. They will read the news, study the company history, industry trends, and other data points that go into making a prediction. The prevailing theories are that stock prices are totally random and unpredictable, raising the question of why top firms like Morgan Stanley and Citigroup hire quantitative analysts to build predictive models. We have this idea of the trading floor being filled with adrenaline infuse men with loose ties running around yelling something into a phone. However, these days we are more likely to see rows of machine learning experts quietly sitting in front of computer screens. About 70% of all orders on Wall Street are now placed by software. We are now living in the age of algorithms.*

Keywords: Algorithm, Deep learning, Finance, LSTM, Price action, python, Stock

I. INTRODUCTION

Demand of Stock have become huge with increase in popularity of Stock in Digital world. Prediction and Analyzing stock can benefit People to think before buying or selling stocks. So,

A new stock price prediction through deep learning algorithms will be analyzed and visualized fisrt. Through this system we can predict any Company stock in the world.

These days we are more likely to see rows of machine learning experts quietly sitting in front of computer screens. About 70% of all orders on Wall Street are now placed by software. We are now living in the age of algorithms. Our goal is to develop a most efficient and accurate system.

Deep-learning-based techniques, particularly CNNs, are the most promising approach for automatically learning decisive and discriminative features. Deep learning (DL) consists of different convolutional layers that represent learning features from the data. In this project, we have described the technique for the prediting stock price based on price action.

Stock markets are conduit of financial resources connecting entrepreneurs and investors. Market Intermediaries are short term traders who carry out high frequency trades and provide liquidity to Stock Markets. We advocate increasing usage of machine learning by intermediaries to maximize short term gains. We design a range of LSTM architectures and loss functions, and supply its predictions to a trading bot that performs portfolio optimization daily to maximize the net worth.

II. PROPOSED SYSTEM

Technical analysis includes reading the charts and using statistical figures to identify the trends in the stock market. Our focus will be on the technical analysis and visualization part. We'll be using a dataset from Google stock Price test and yahoo finance. This project will utilizes the ARIMA model for base predictions and then we will build a Deep Learning model to improve it further. System predicts data and then compares it to real time data and then again considers data if the predicted data is similar. If not the system trains for flaws and predicts data again. This is done on a time series.

Analyst calls are expert predictions for Earning Per Share (EPS) of a company and show weak correlation with the company's stock price. They are reported every few days, however, and we needed to smoothen this data to denoise its

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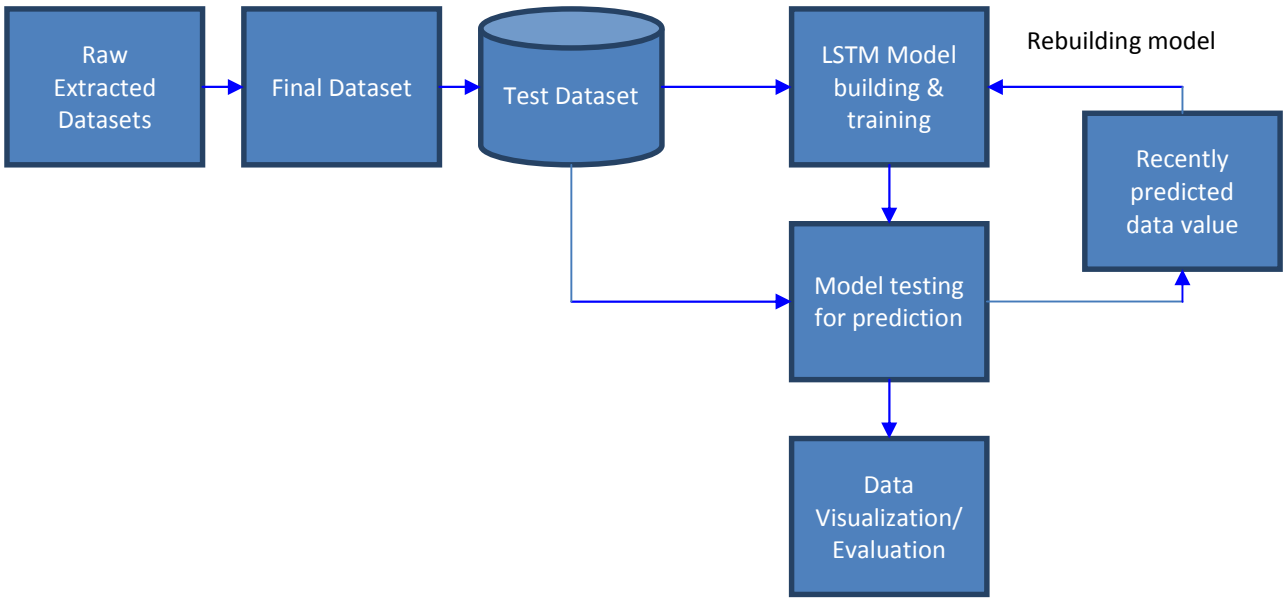
predictions as shown on the right. We decided to augment our stock price data with the analyst call data to see if it could improve the MSE in multi-step LSTM prediction.

2.1 Proposed Methodology



2.2 LSTM Module

It is special kind of recurrent neural network that is capable of learning long term dependencies in data. This is achieved because the recurring module of the model has a combination of four layers interacting with each other.
It will be trained continuously to predict data and acquire accuracy.
We have implemented sequential algorithm for better data processing and acquiring accuracy.
Stock Price data for 4 companies : Ford(1983 to 2020), GM (1985 to 2020), Toyota (1980 - 2020) and Tesla (2010 - 2020): from Capital IQ Database by CompStat
Used the Mid price computed as a daily average of the High and Low price.
The training data is scaled using Standard Scaler.

2.3 ARIMA

Autoregressive Integrated Moving Average
Used for modelling time-series data. It was made to be “stationary” by differencing
Order of differencing is estimated using auto-correlation
It is a regression based on predictors consisting of the lags of dependent variables

2.4 LSTM

We train a Multi-Stack LSTM with 4 LSTM layers and 4 Dropout layers followed by a Dense layer. It takes as input the stock price for the past 50 days and outputs the stock price prediction.
We train the LSTM using mean squared error (MSE) as our loss function and also use that for reporting our performance

III. CONCLUSION

There are many techniques for stock trading, we have used 3 types of analysis. Sentimental, fundamental and price action analysis. Our goal was to acquire accuracy for stock trading using different ‘P algorithms. We have predicted a price action chart. The stock picking and trading points are been predicted. ARIMA and LSTM have comparable

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accuracy for stock price predictions on majority of the data. LSTM fares poorly on highly volatile stocks, and ARIMA outperforms it. However LSTMs have a more flexible training procedure that can be modified to indirectly maximize the profit. Augmenting Weakly correlated data, along with hyper parameter tuning, can be used to optimize LSTM performance. As a future direction, we can utilize sparse auto encoders with 1-D residual convolutional networks to denoise the data. The analyst calls are passed through a separate LSTM as shown on the right. Bi-directional LSTMs enable us to fit the data better by incorporating past and future dependencies during training, while attention selectively chooses from all past inputs which one to weight more. We hoped this would capture hidden trends in the data

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