

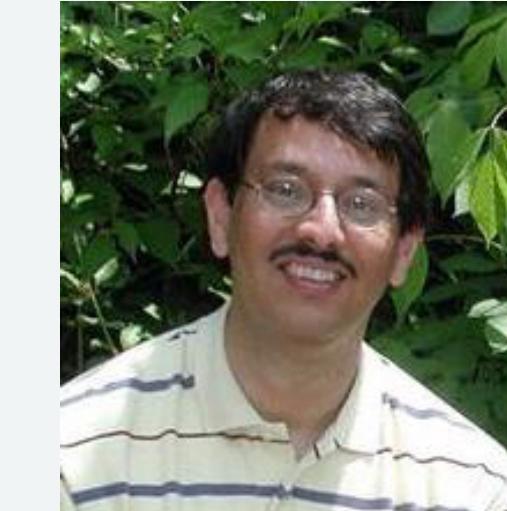
# STOCK PRICE PREDICTOR



TEAM



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## PROBLEM STATEMENT

Predicting the stock market price has always been one of the most difficult tasks and risky businesses.

For a while, financial companies, hedge funds and professionals who are invested in stock trading have been using statistics models to learn about the market behavior and make profitable investments and trades. Trying to predict the stock market by using different forecasting techniques to predict future stock values based on past returns is an interesting challenge which has gained much traction from data scientists lately.

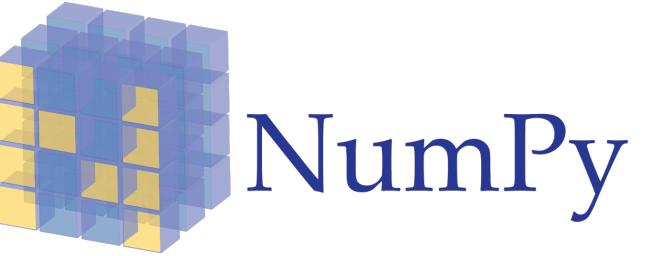
One particular question arise: can we use machine learning techniques to build models that can make accurate stock predictions?

## PROJECT GOALS

- Stock Price Predictor is the project on technical analysis, visualization and prediction using stock datasets from multiple sources provided by Yahoo! Finance and Google Finance APIs. This project aims to build a recurrent neural network with long short-term memory (LSTM) cell using Tensorflow to predict stock market prices.

- The model will then be deployed as a REST API and become available to users by accessing the web application through the browser. Users will then be required to enter the stock name to get the predicted stock value from the trained model.

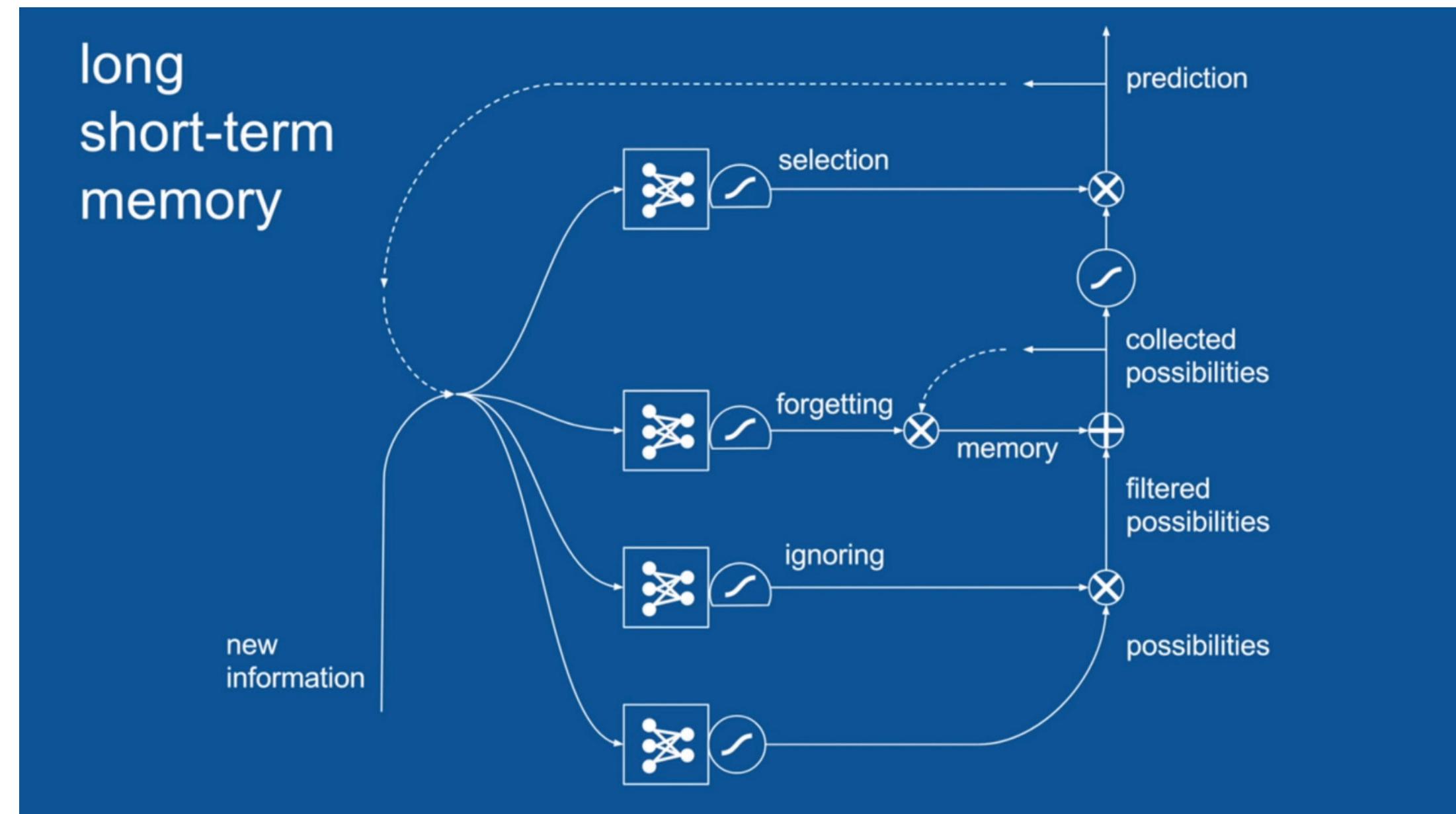
## TECHNOLOGIES



pandas  
 $y_{it} = \beta' x_{it} + \mu_i + \epsilon_{it}$



## DESIGN SPECIFICATIONS



*Fig. 1. Long Short Term Memory (LSTM) neutral network model.*

### Data Retrieval:

- Download full dataset on Yahoo! Finance ^GSPC from 01/01/2001 - 03/31/2019.
- Utilize Google Finance API to retrieve individual stock prices in the S&P 500 index.

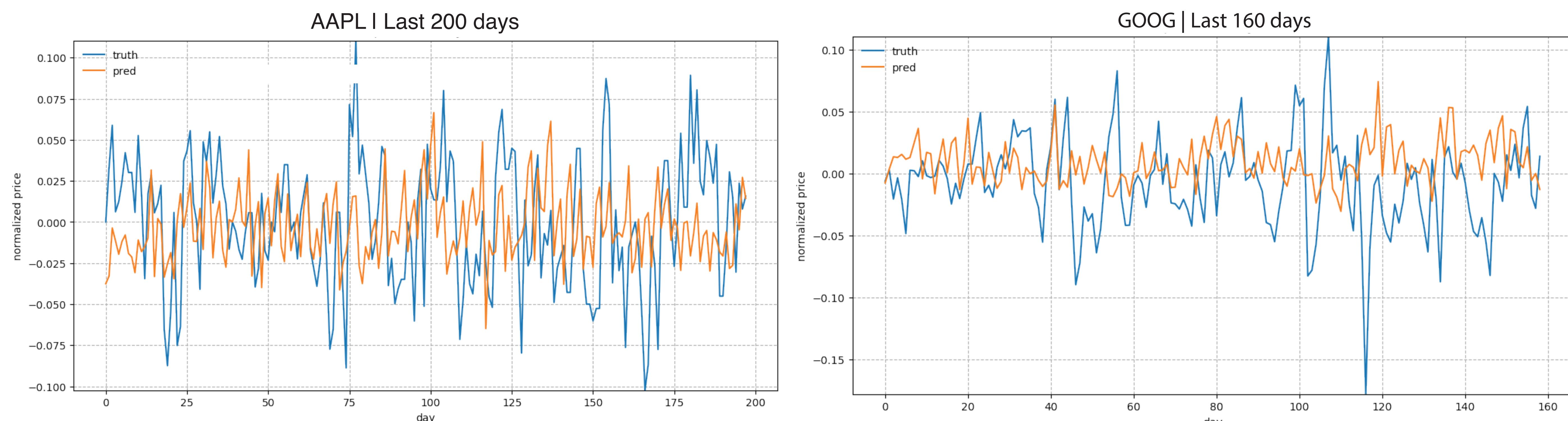
### Data Processing:

- Users first enter the stock symbol they want to run training sessions or get predictions through the web input.
- The data is then fed to the LSTM neural network model to be trained to become better at predicting stock prices in the future.
- After the training sessions, Tensorboard is used to provide visualization of the data and to help users understand the results and learning process.

## CHALLENGES

- The biggest challenges encountered during this project was the data inconsistency, inaccuracy and how to improve the model's predicted outcomes.
- This project's main focus is on building and training the Recurrent Neural Network to perform complex calculations rather than trying to improve its performance.
- Furthermore, in real life, stock prices are also affected by major events, company announcements and other external factors that is almost impossible to capture in the model or even predict beforehand.
- Nevertheless, there are still rooms for further improvements to be made for this project in the future such as adding more hidden layers to the neural network, changing the method used to fit the model data, or even using a completely different advanced machine learning algorithms to achieve a better result.

## RESULTS



*Fig. 2. Actual vs Predicted latest stock prices of AAPL, GOOG in the data set.*