STEVENS
Institute of Technology

CPE 695 Group Project Team 11

# Weather Forecasting using LSTM

# Introduction

- The need for this project.. real world applications
- Dataset description
- Algorithms used
- Web application development using Django and deployment to AWS

# The need for Weather Forecasting

- Agriculture Industry

# The need for Weather Forecasting

- Aviation industry

# The need for Weather Forecasting

Weather forecasting is quite literally a part of the economy now, for example, in the last decade, the US has spent approximately $5.1 billion on weather forecasting, producing benefits estimated at six times as much.

# Dataset description

- From where? => www.wunderground.com
- How? => using selenium
- How much? => 3 years worth of data for three cities (Mumbai, NYC and Dallas).. for every hour.. which amounts to around 81k datapoints (27k for each city)

# Algorithms used

- ARIMA
- Univariate LSTM
- Multivariate LSTM
- Prophet by Facebook

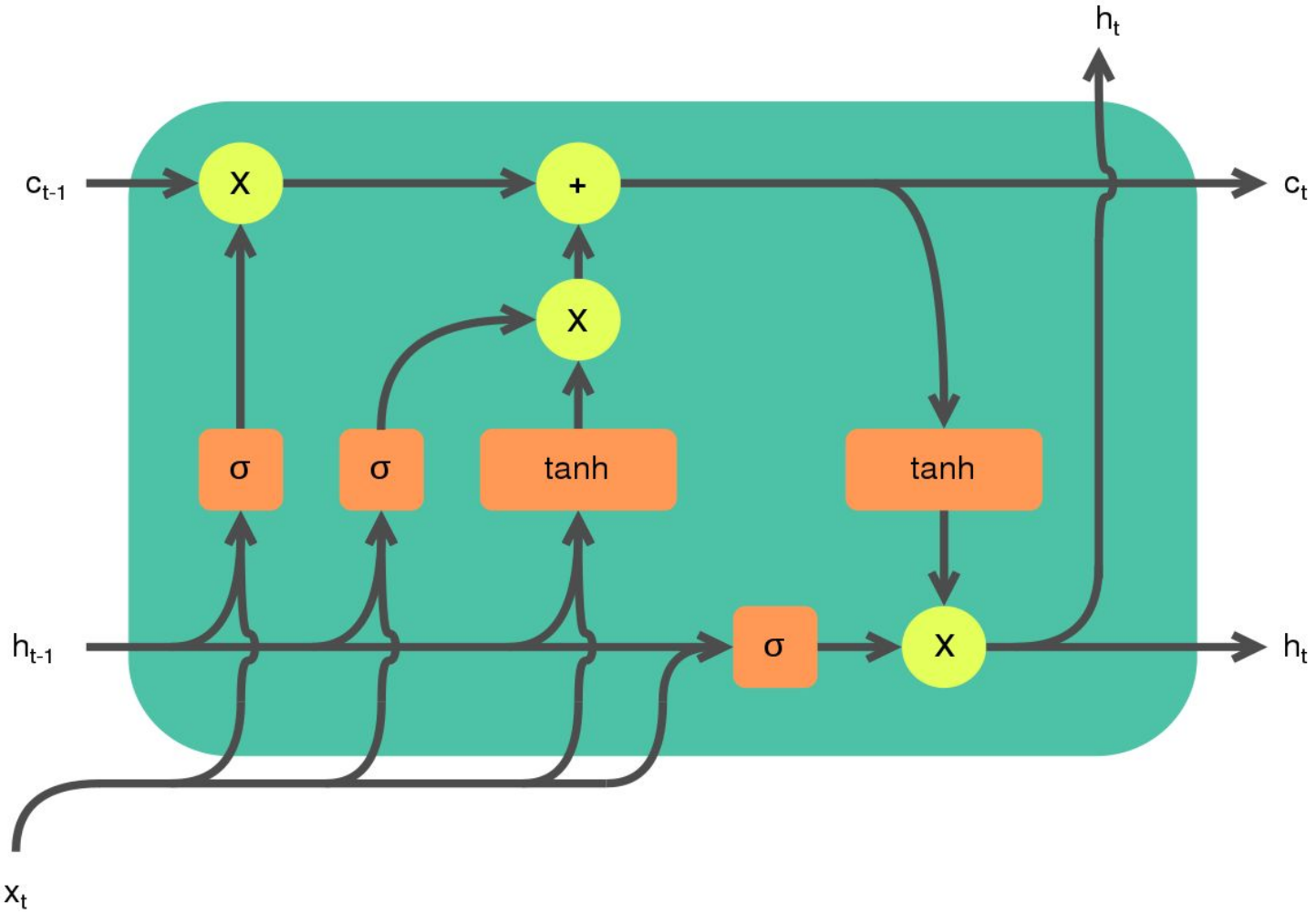
# Algorithms used

## ARIMA

- Is the data stationary?
  - Visual inspection
  - Augmented Dickey-Fuller test or the ADFuller test
- Use Auto-Arima to fit the data
- Find the optimum orders for parameters p, d and q
- Forecast data for the next 100 days

# Algorithms used

## Univariate LSTM



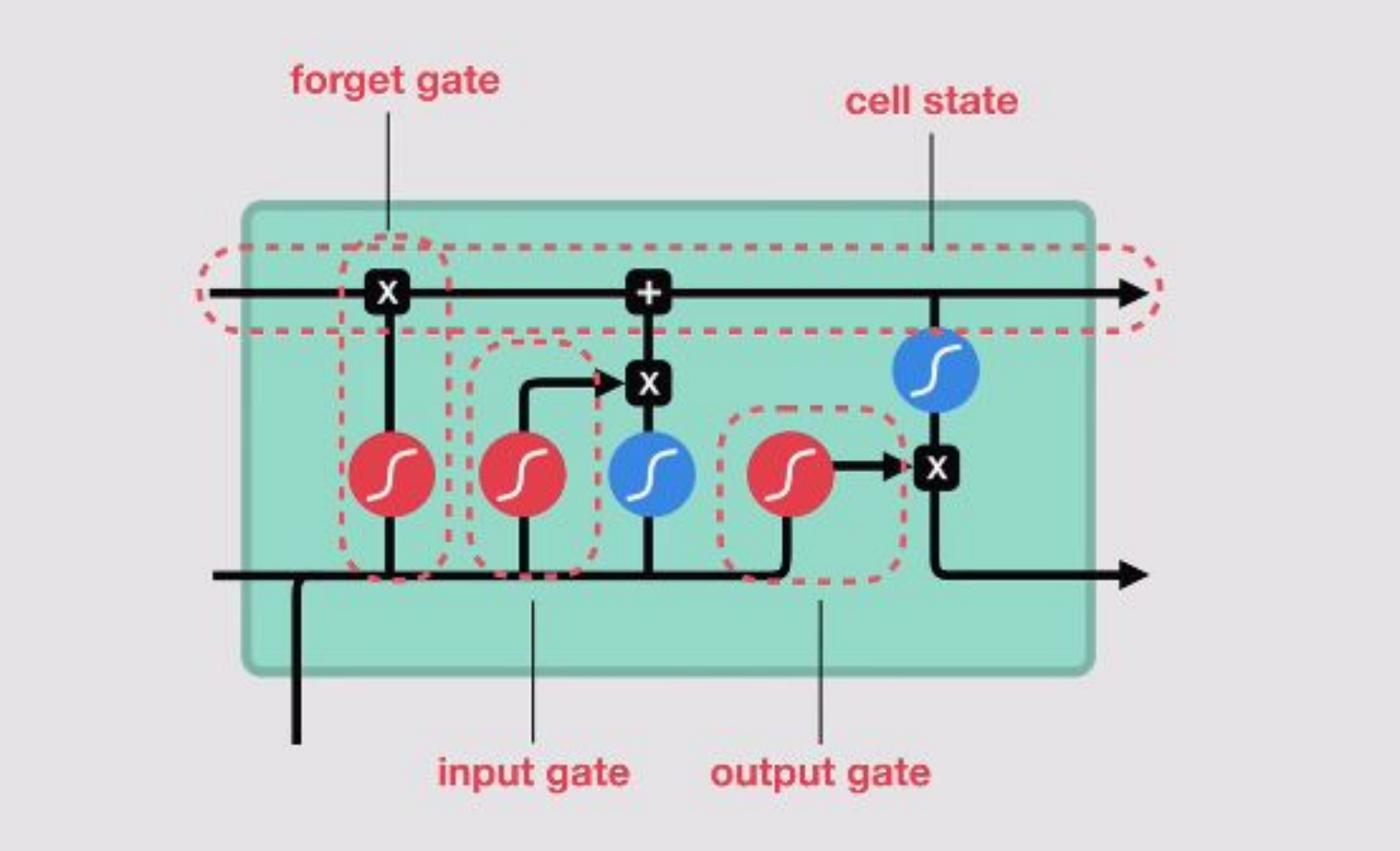
# Algorithms used

## Univariate LSTM

- How does it work
- The training data shape
- The input shape required for the keras model
- Training vs validation losses
- Forecasting the weather for next 5 days

# Algorithms used

## Multivariate LSTM




Made by Siddhesh Shaji

# Algorithms used

## Multivariate LSTM

- How does it work
- The training data shape
- The input shape required for the keras model
- Training vs validation losses
- Forecasting the weather for next 5 days

# Algorithms used

## FBProphet

- Developed by Facebook
- Based on three decomposable components viz. trend, seasonality and holidays
- Get the data in suitable format (ds and y)
- Plot prediction components
- Forecast for 5 days and perform cross-validation to find the RMSE score

# Application development

## Django and AWS

- Django is an easy to use web application development framework which is a good choice for rapid and clean development
- AWS is a cost efficient cloud service platform by Amazon used by thousands of companies for various purposes like hosting applications, data handling, etc.

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The End
Thank You