



The Data Incubator

Project Proposal:  
Wait Time Prediction for Airport Taxis at O'Hare  
International Airport (ORD)

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July 2020

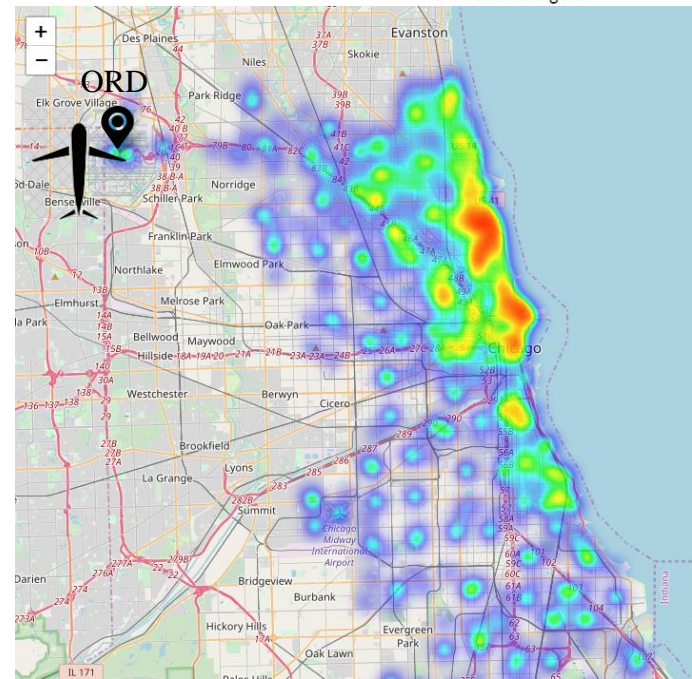
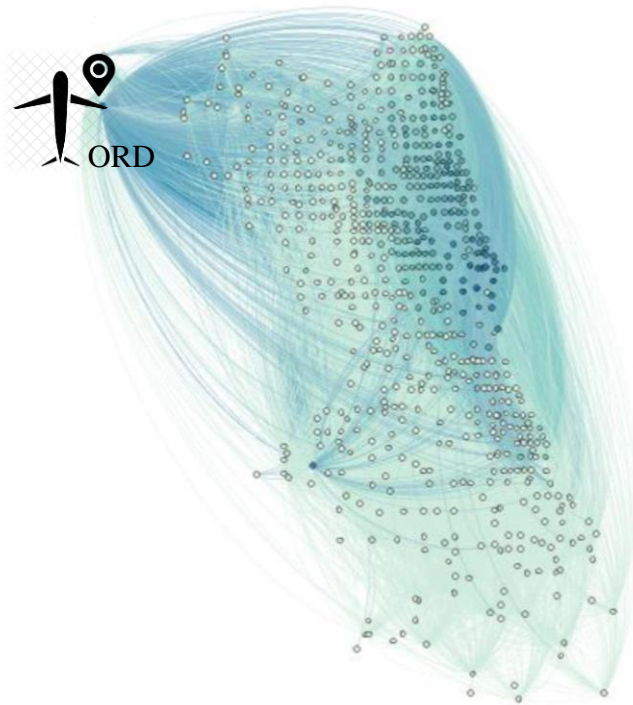
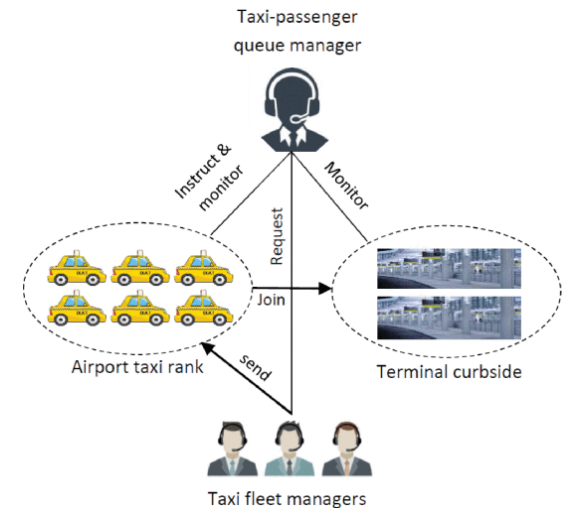
# Problem Statement

➤ The human error in manual airport taxi demand estimation causes:

- Long queues of taxis and traffic congestion.
- Long queue wait times for the passengers.

➤ O'Hare International Airport (ORD) is one of the busiest airports in the US, and it is one of the high taxi pickup locations in Chicago. **Therefore, it is essential to develop a ML model that can estimate the taxi queue wait time at ORD.**

Manual airport taxi demand estimation system



# Preliminary Data Analysis



## Chicago taxi trip data

Pickup/ Drop  
off location

Pickup/ Drop  
off time

Distance of  
the trip

Fare and tip  
amount

Taxi  
ID



## O'Hare airport flight data

Number of  
flights

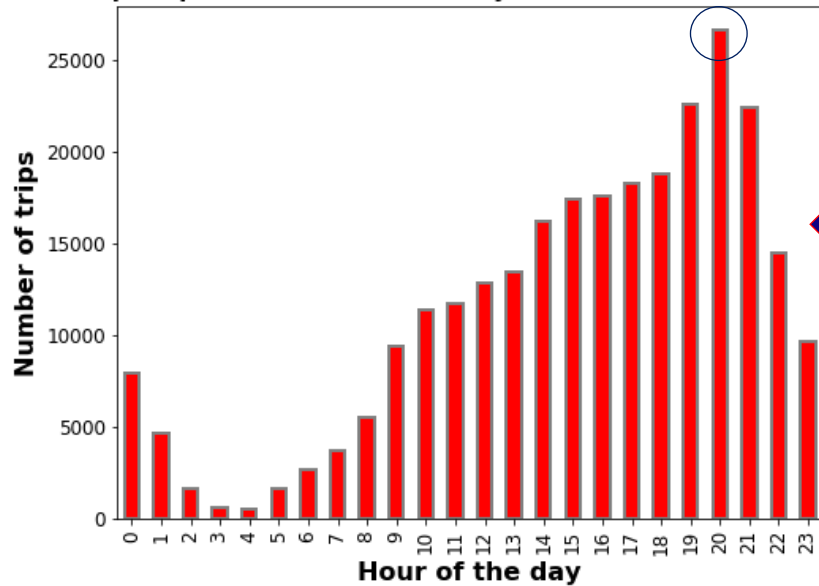
Passenger  
arrivals

Delay of  
flights

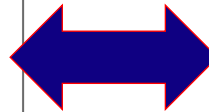
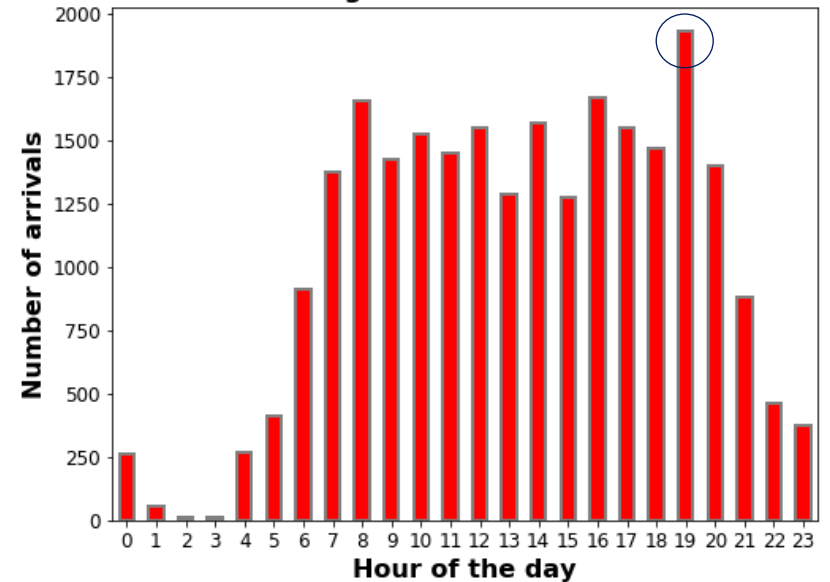
Passengers  
wait time



Total pickups at each hour of the day at O'Hare International Airport



Total number of flight arrivals at each hour of the day

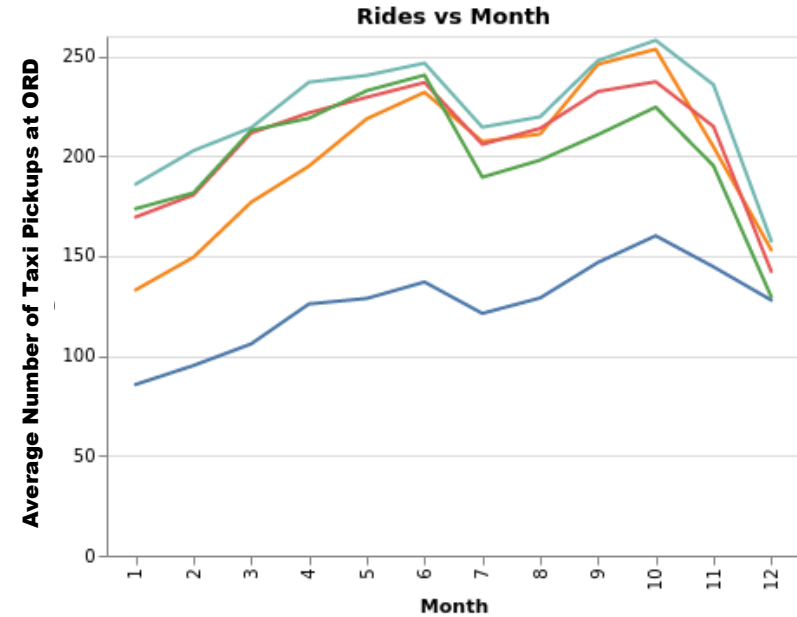
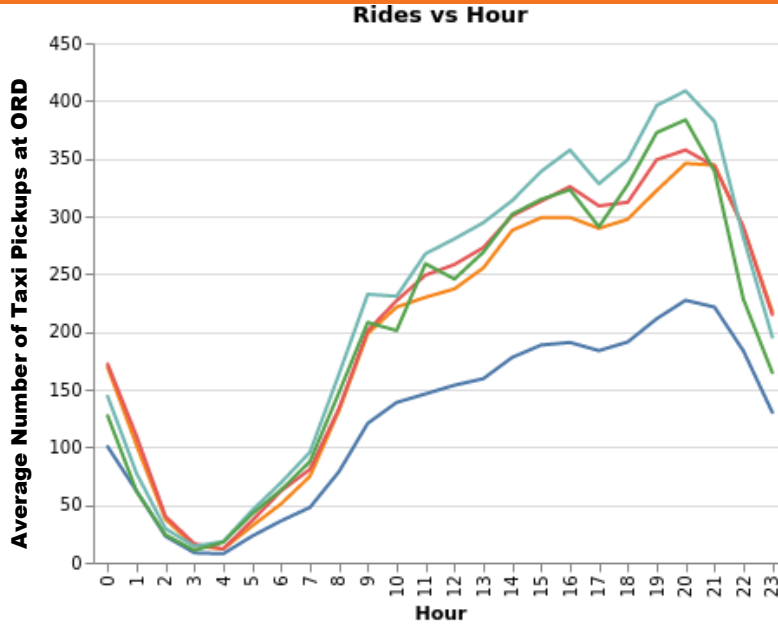


➤ The maximum number of taxi pickups occurs at 8 p.m. which is related to the maximum number of flight arrivals happens at 7 p.m.

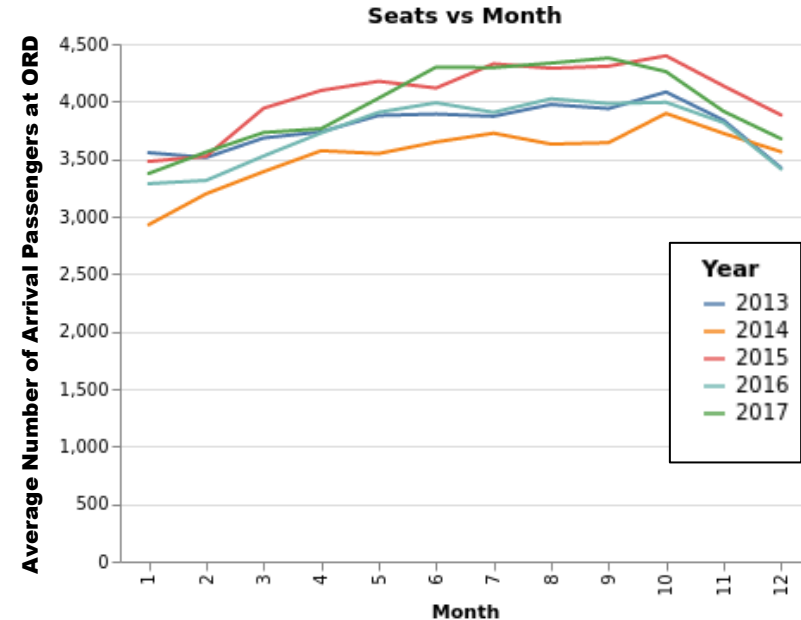
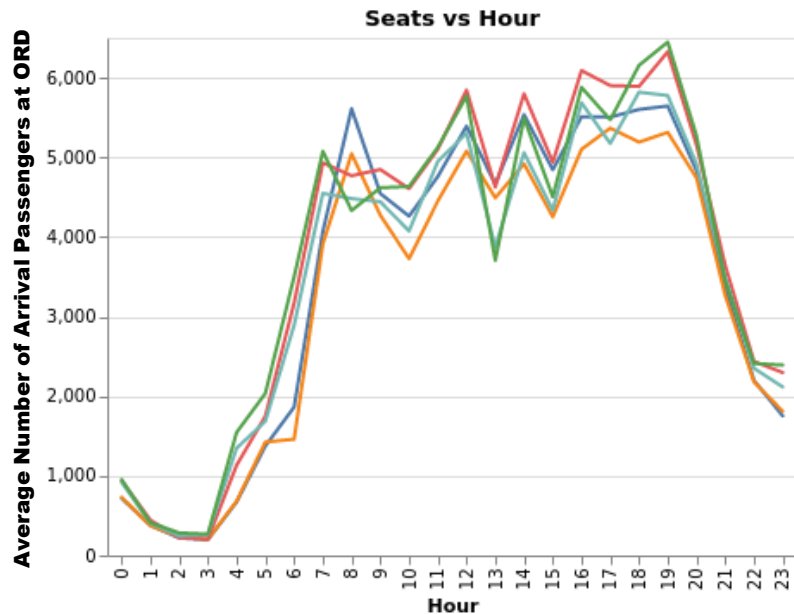
# Further Data Analysis after Invitation to Interview



Chicago  
taxi trip data

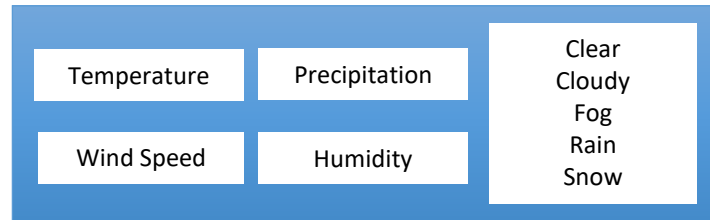


ORD  
flight data

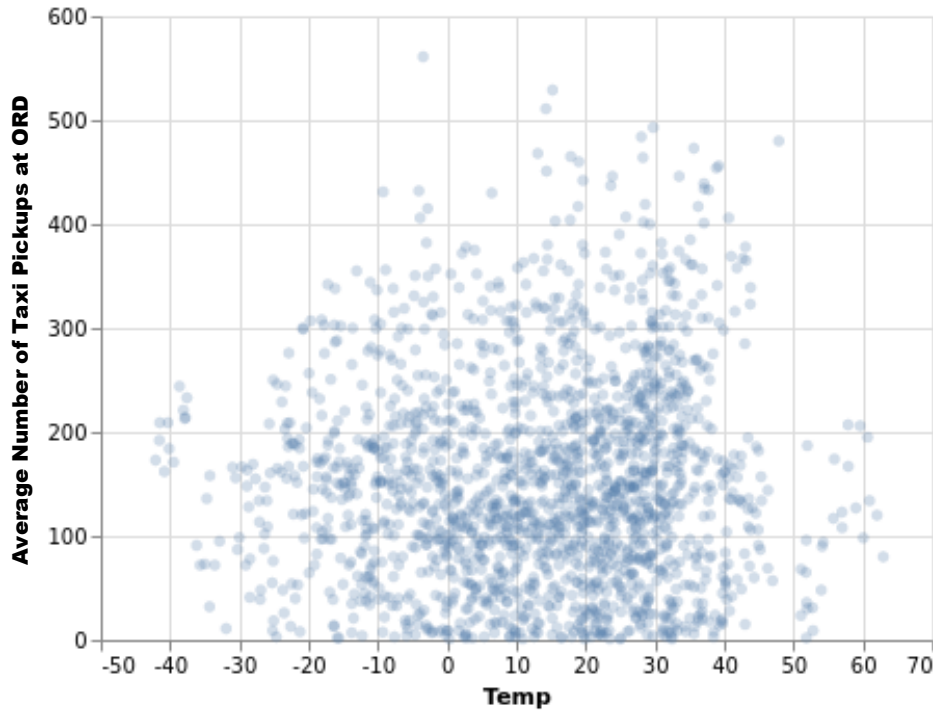


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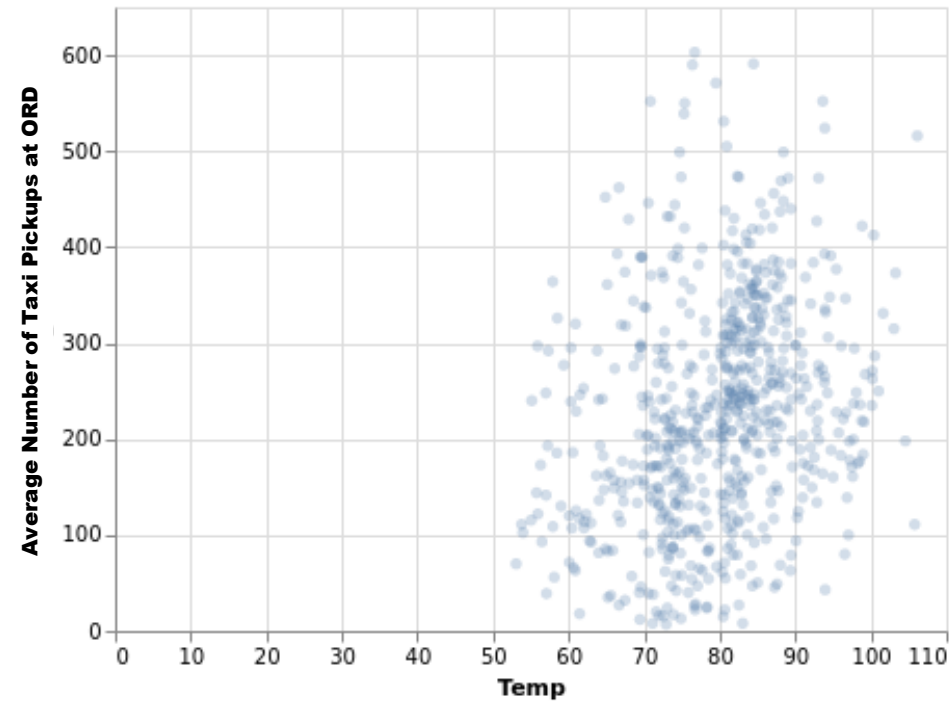
  
Weather data



January



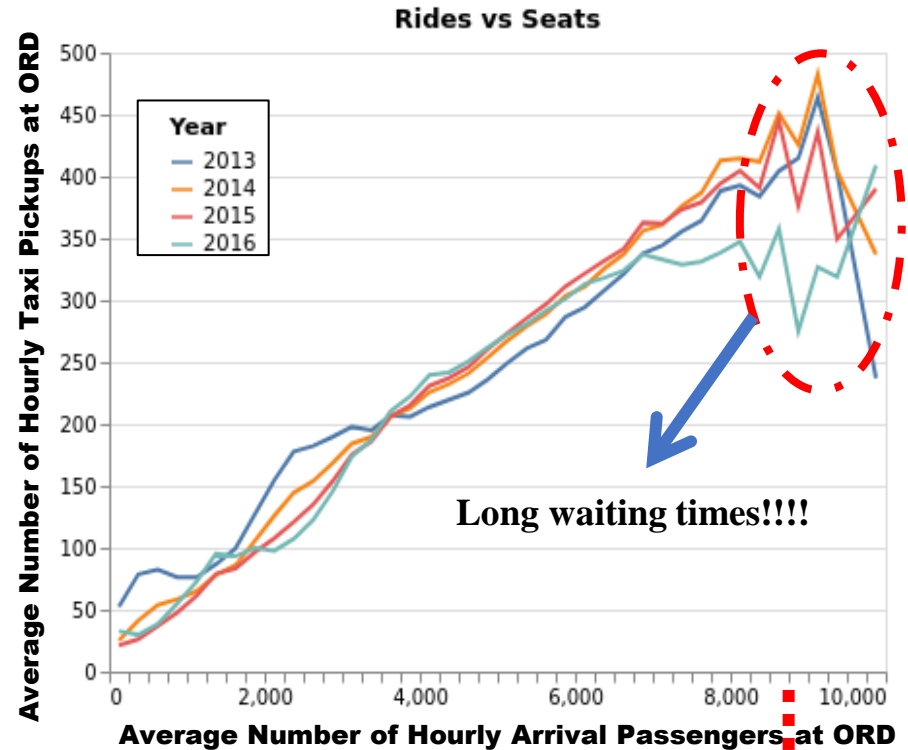
July



# Further Data Analysis after Invitation to Interview

➤ Using random forest to predict hourly taxi rides (pickups) at O'Hare airport based on features such as: year, month, day of the month, daily hour, temperature, and number of arrival passengers.

- Number of estimators: 100
- Train-test split: 80-20%
- 5 Fold Cross-validation
- RMSE=4
- $R^2$  (Test score): =0.68



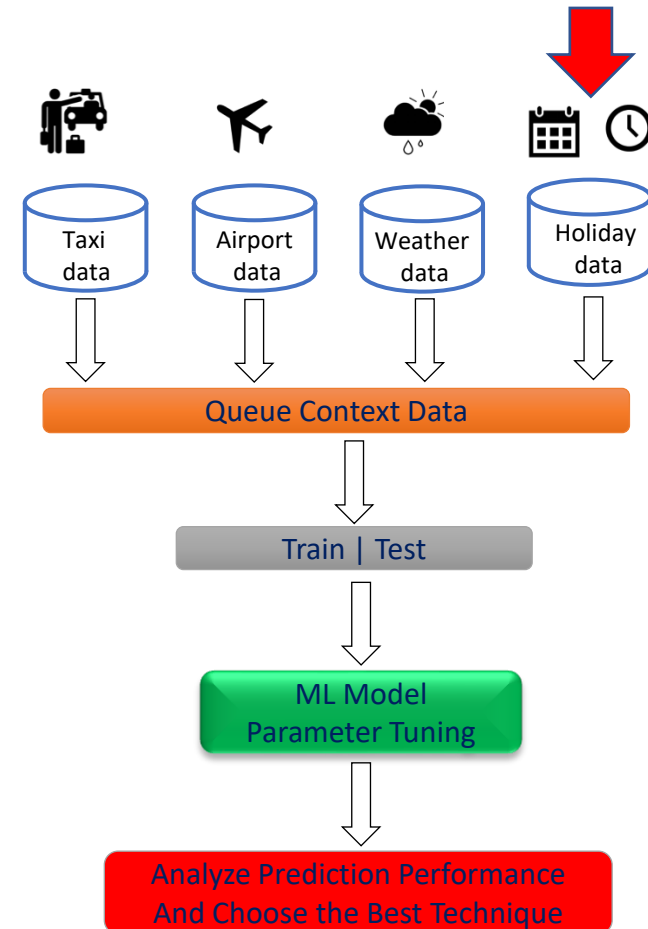
**9,000 arrival  
passengers limit!!!**

# Future Work

➤ The following ML models will be investigated:

- Random Forest
- Linear Regression

➤ Development of an interactive app for users :



	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
Data wrangling/Analysis								
ML model development								
HTML platform								
Testing/Report								

Thank You For Your Attention