

Domestic U.S. Flight Delay Prediction

Team 36 – Yigithan Akercan, Shaambhav Dave, Zack Dearman, Ronith Gonsalves, Anish Jaisinghani & Krishna Maran

Introduction & Motivation

Project Goal:

- To develop a regression model and associated interactive visual to predict flight delays in the domestic United States

Users & Impacts:

- Airlines: Provide insight to **optimize operations** through resource allocation & schedule adjustments
- Individual passengers: Inform better traveling decisions & **minimize unexpected disruptions**

Data

Bureau of Transportation Statistics (BTS)

U.S. Domestic Flights (Jan. 2019 – Aug. 2023)

- Airline
- Cancellation
- Delay Time
- Delay Reasoning
- Departure Date
- Departure Time
- Origin City



Algorithm & Visualization

Observations

- No definitive relation between date and departure delay
- Transition away from regression model as a predictor

Learning Models:

- **Random Forest Regressor**
- Generates continuous delay predictions according to Airline, Airport, and Month features.

Visualization:

- **D3 JavaScript libraries**
- Considers 63 busiest U.S. airports, displaying **5 airlines with lowest expected delay**
- Given airline, airport, and month, displays **expected delay & cancellation probability**

Experiments & Results

Evaluation:

- Evaluate accuracy of Gradient Boosting & Random Forest Classifiers with both 2 & 3 features
- 80% Train, 20% Test

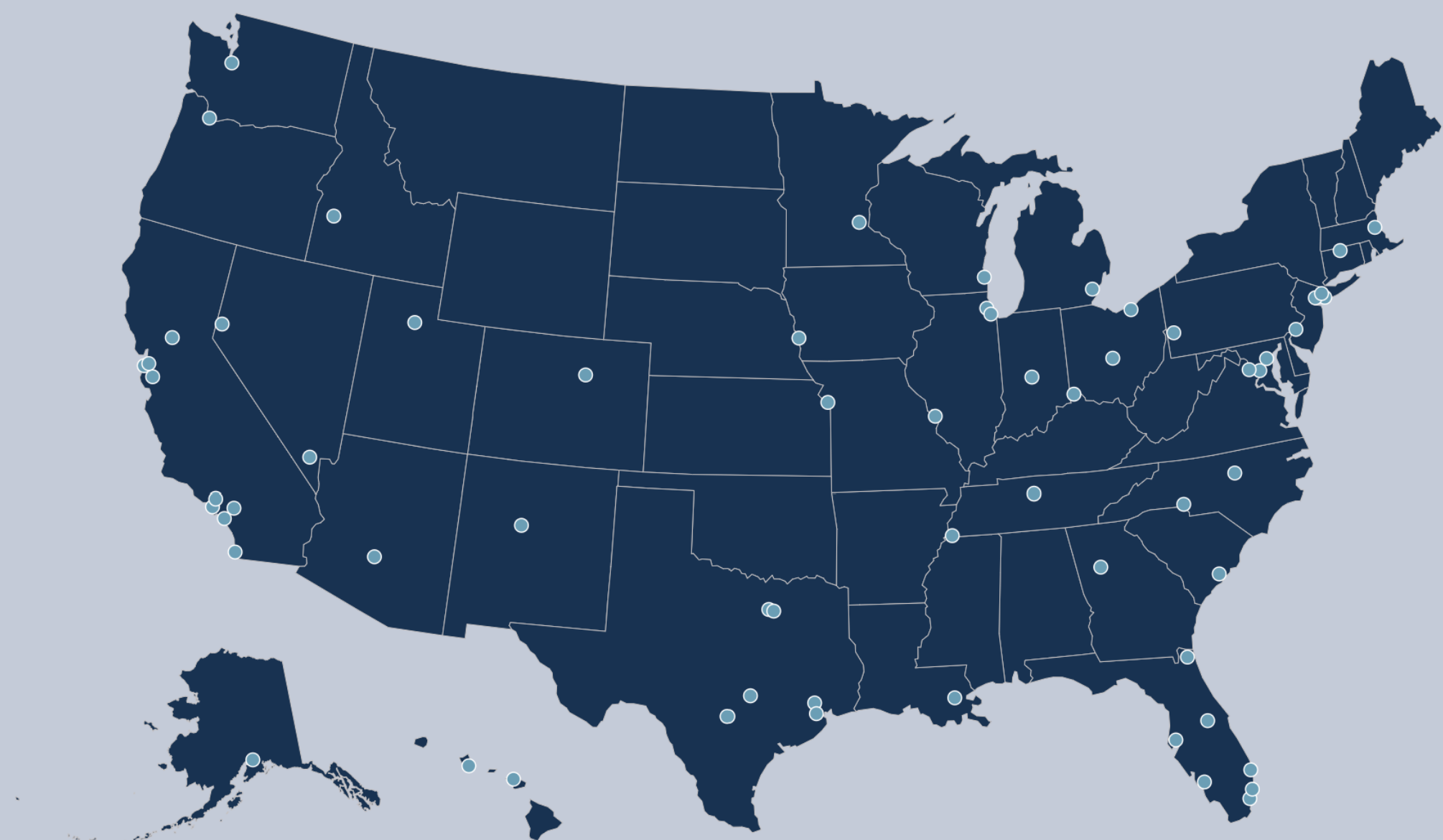
Results:

Algorithm	Training Accuracy	Test Accuracy
Gradient Boosting Classifier (2 Features)	0.8236	0.8228
Gradient Boosting Classifier (3 Features)	0.8236	0.8228
Random Forest Classifier (2 Features)	0.8237	0.8227
Random Forest Classifier (3 Features)	0.8250	0.8206

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Select Airline:
-
Select Airport:
-
Select Month:
-
Submit



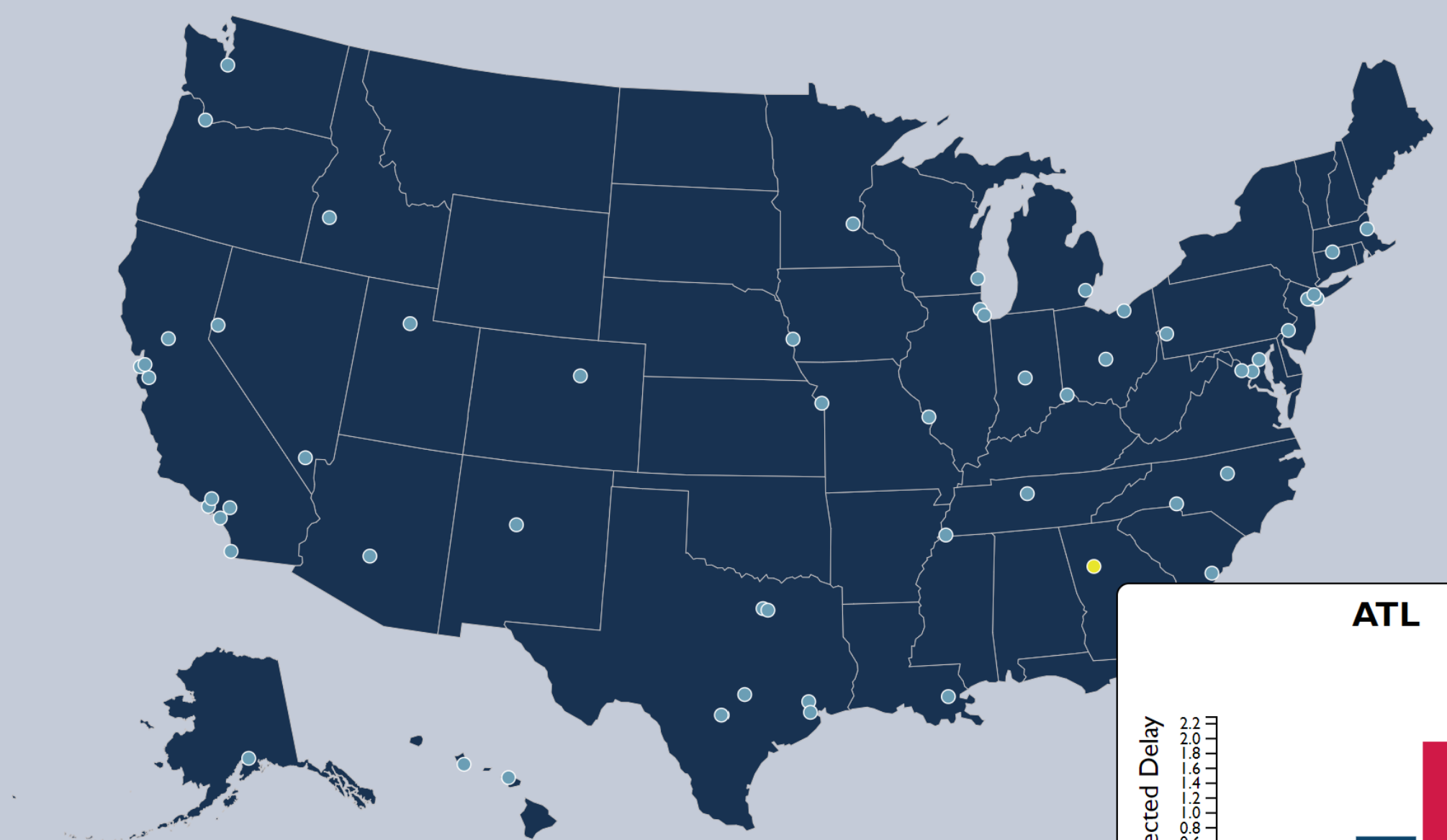
All data is sourced from the United States Bureau of Transportation Statistics.
All calculations are estimates and may not be 100% accurate.

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Select Airline:
Delta Airlines
Select Airport:
Atlanta
Select Month:
April
Submit

Predicted Delay: 8.14 minutes
Cancellation Probability: 0.0%



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DCA

