FLY ON TIME

A Travel Assistant with Flight Delay Tracking and Predictions

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MOTIVATION

Flight delay leads to long-time waiting and uncertainty, and various delay reasons may result in stress and frustration on travelers. However, such problems can be informed in advance or avoided by **investigating previous delays** and scheduling flight trips accordingly.

OBJECTIVES

Our objective can be mainly described as two parts:

1. **Visualizing** historical flight delay information for users to acknowledge delay statistics at different airports and its daily changes;
2. Building a delay **prediction model** for custom flight recommendation.

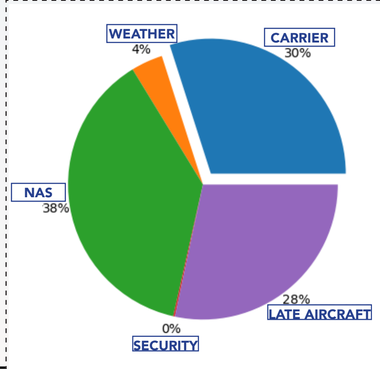
DATASET & METHODS

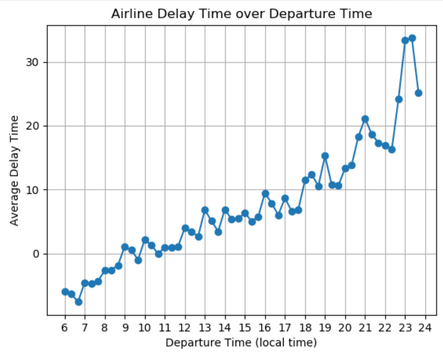
2488918
domestic flight records in yr 2018

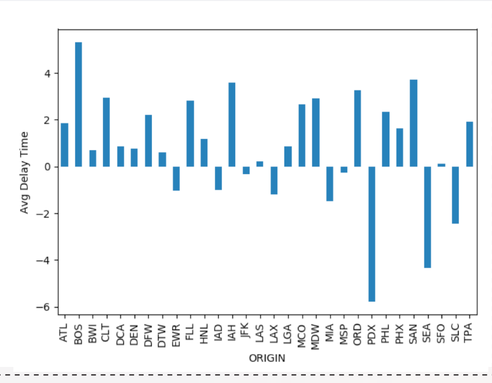
15.6%
flights delay for more than 15min

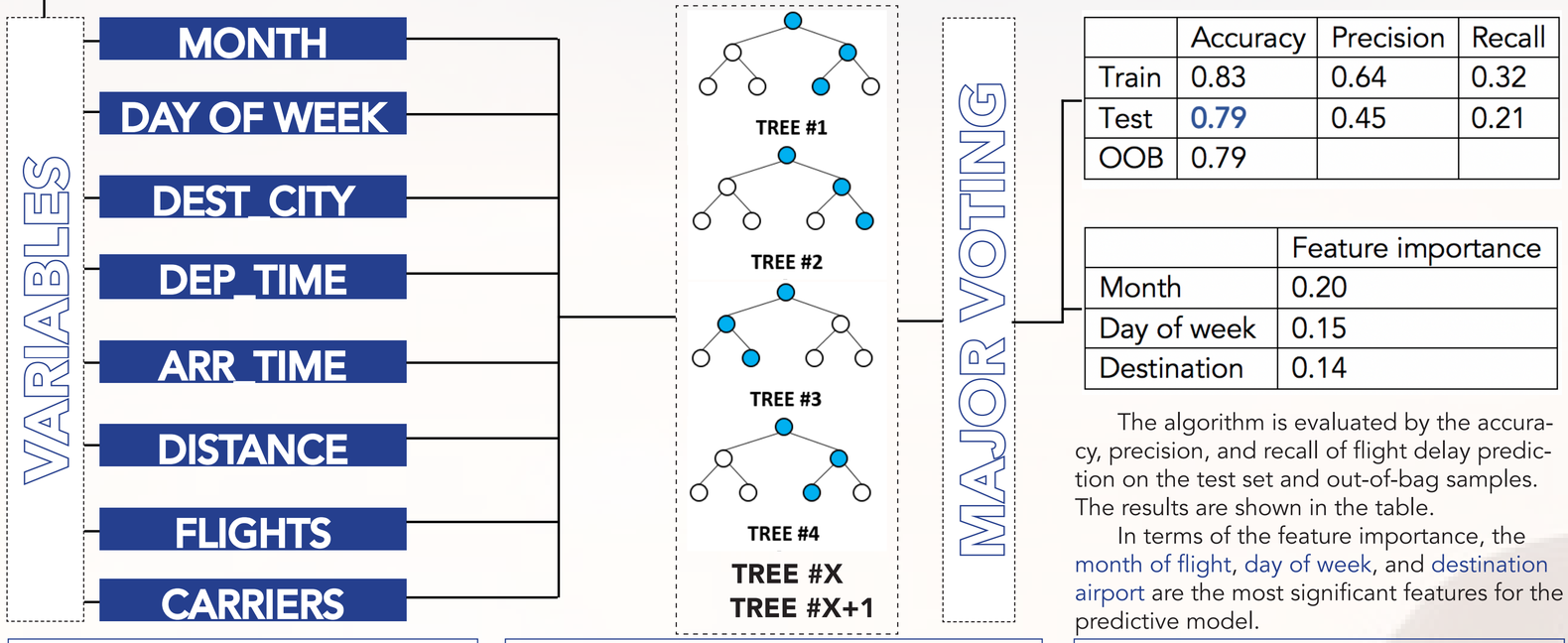
Delta
is the least delayed airlines among all

2.5%
flights delay for more than 2 hours









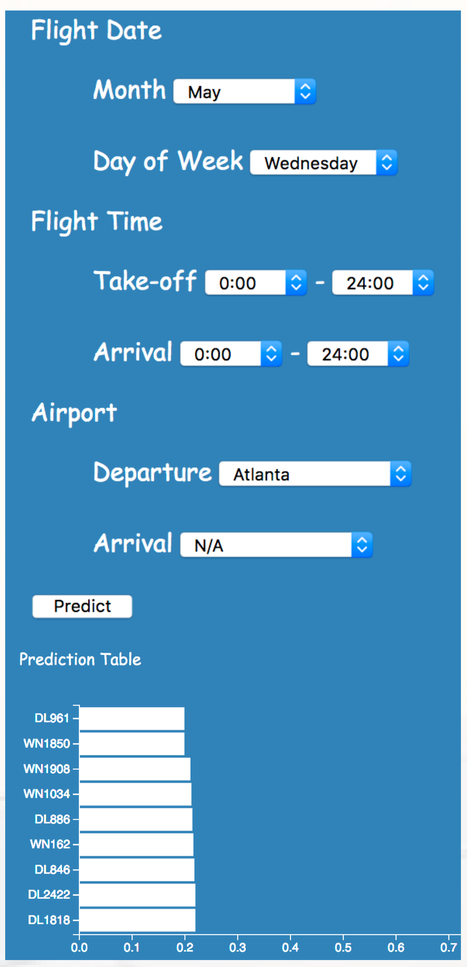
	Accuracy	Precision	Recall
Train	0.83	0.64	0.32
Test	0.79	0.45	0.21
OOB	0.79		

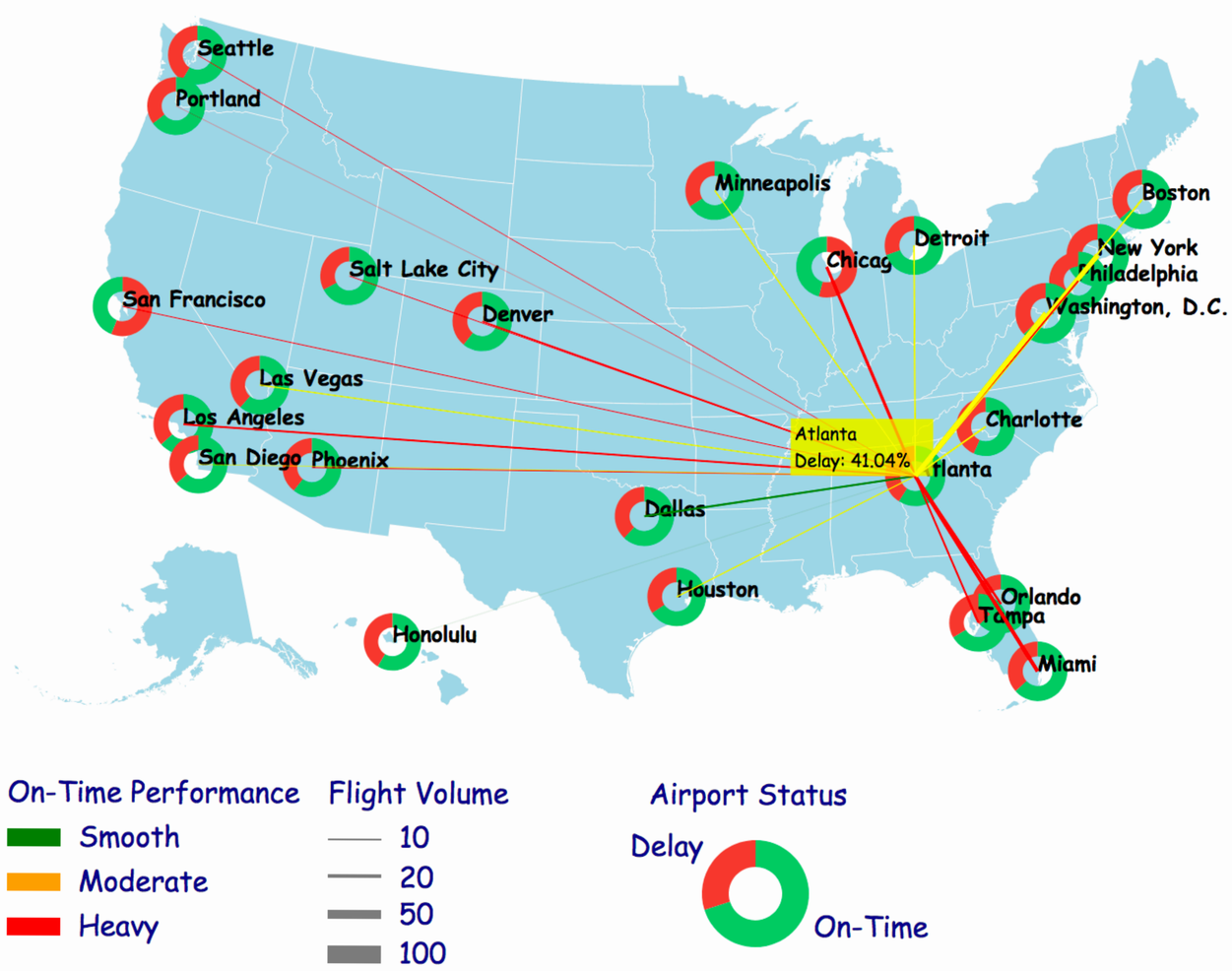
	Feature importance
Month	0.20
Day of week	0.15
Destination	0.14

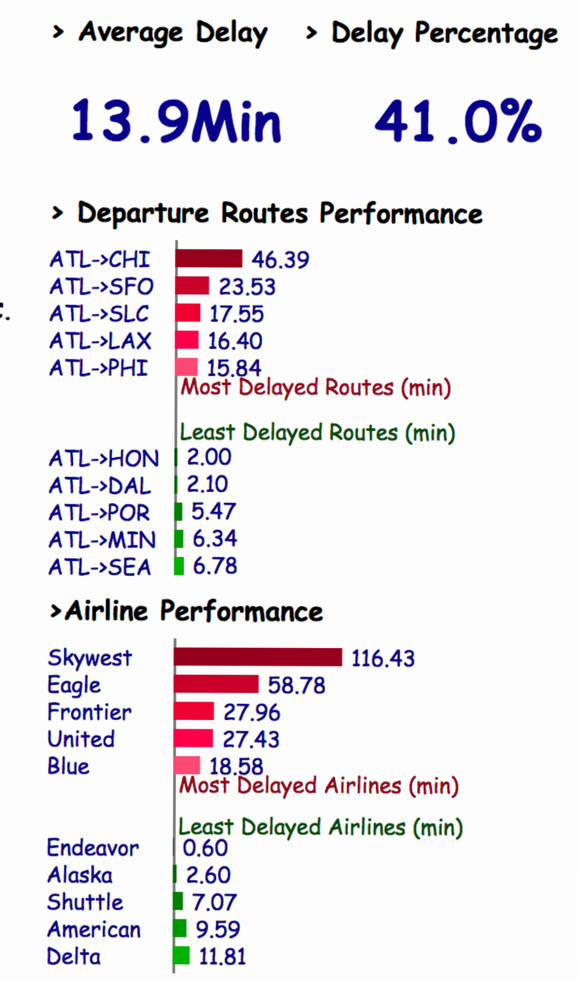
The algorithm is evaluated by the accuracy, precision, and recall of flight delay prediction on the test set and out-of-bag samples. The results are shown in the table.

In terms of the feature importance, the month of flight, day of week, and destination airport are the most significant features for the predictive model.

INTERFACE







EVALUATION

In order to evaluate our interface, our team decided to conduct a **cognitive walkthrough experiment** with potential user groups. Cognitive walkthrough is a **qualitative research method**. Another possible approach to the evaluation of our interface is to go through a quantitative research method. However, quantitative research method usually needs a lot of participants and it is really hard for us to find a lot of participants in a short time.

Task 1: Find the delay status for the flights from Atlanta to Las Angeles during 2018 Christmas period.
Task 2: Find the delay status for the airports of Atlanta and Las Angeles during 2018 Christmas period.
Task 3: Use the prediction functionality to find what is the possibility for future delay of this year.
We recruited 5 participants for the evaluation session. All of the participants are students from Georgia Tech.
Task 1:All participants interacted with the filter panel correctly and easily. They all selected the correct month, departure city and arrival city in a short amount of time. However, some of the participants seemed to have some confusion with other filter such as the day of the week.
Task 2:Most of the participants knew to hover on the city icon to see the city performance under the filter condition. They reported problems such as the paths that connects the city are overlapped with each other and make the map really messy. On the other hand, some of the participants also reported that some of the city icons also stacked on top of each other, which make the hover action hard to accomplish
Task 3:All the participants knew to press the predict button to predict the future delay. However, most of them cannot find the panel that showed the prediction result.

CONCLUSION

Although Flight Delay is a random event, our project shows that it is largely related to factors like **date, airport, airline carrier**. With the visualization and prediction, travelers can schedule their trips and reduce their chance of encountering flight delays in advance.

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