

Crunched Connection

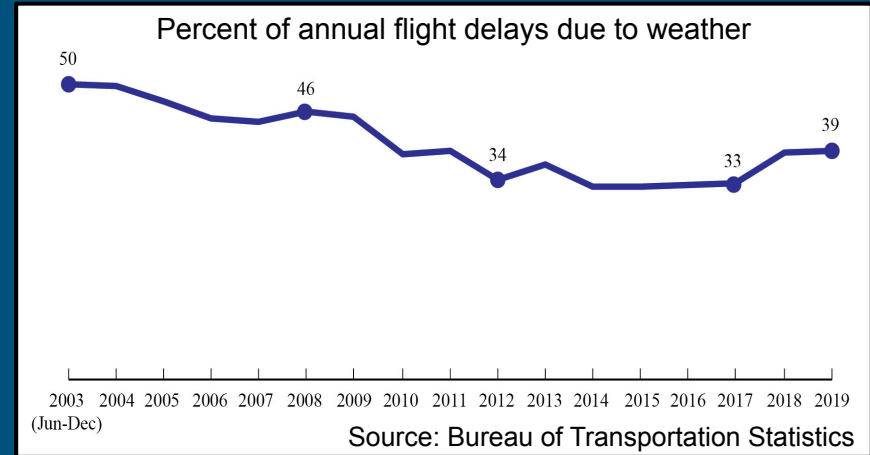
Will weather leave you stranded at the airport?

Maria Zatko

Insight Data Science Fellow

Feeling anxious about a tight flight connection?

Over 800 million passengers annually, and over 20% of flights are delayed or cancelled.



Use **Crunched Connection** several days before trip to determine if weather is likely to impact your travel

App relies on flight data, weather forecasts, and machine learning



Flight Itinerary Details

Select Main Carrier

Carrier

Alaska Airlines ▾

Select Departure Information

Departure Airport

SEA ▾

Connecting Airport


TUS ▾

Date

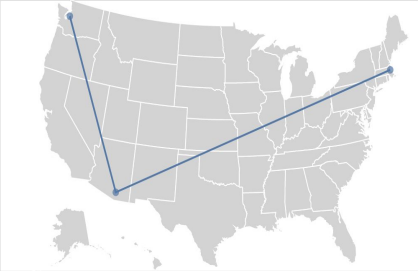
2019/12/31

Scheduled Departure Time

Crunched Connection



Use this tool several days before your flights to determine if severe weather will impact your connection.



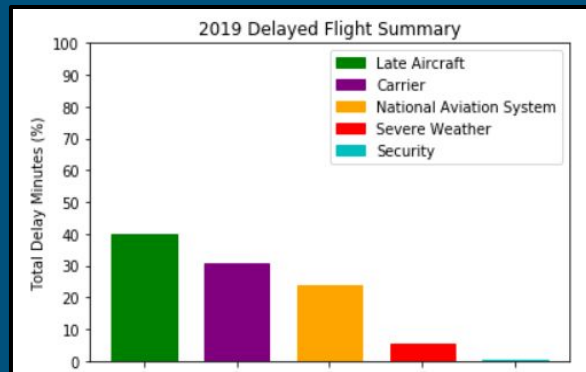
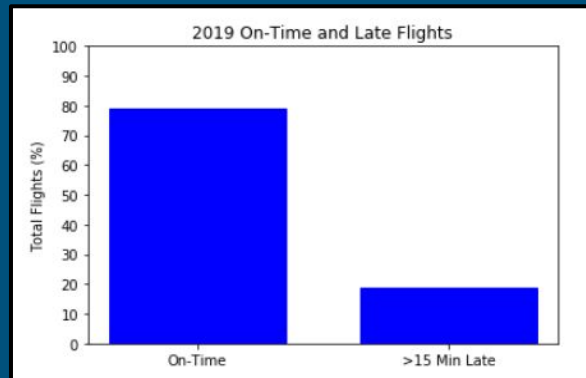
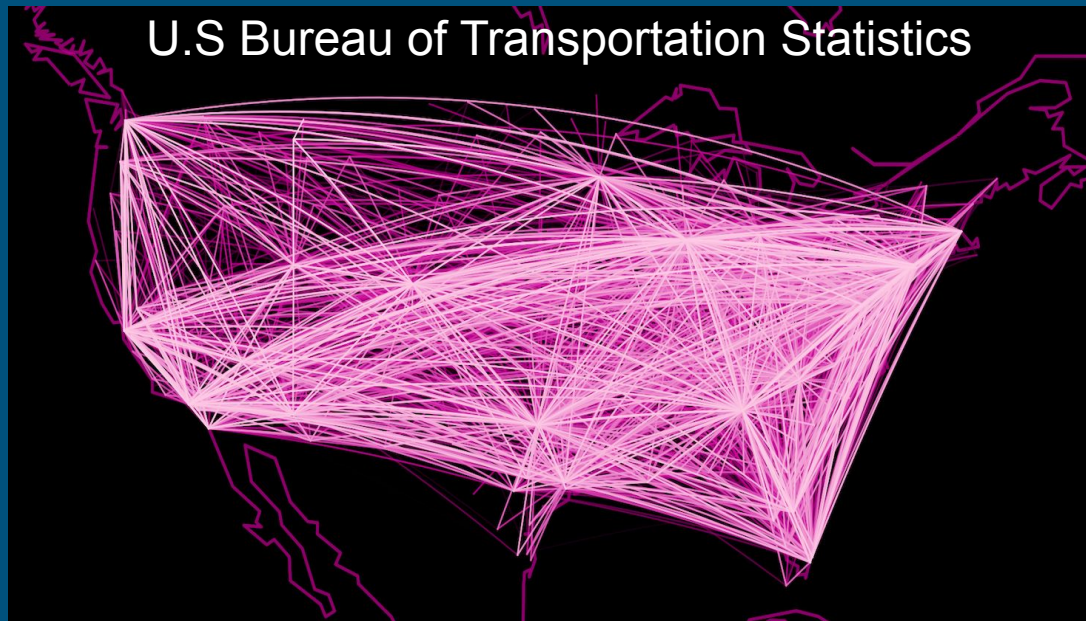
You have 0 hours and 49 minutes to make your connection in TUS.

User input now being ingested into machine learning algorithm...

Your departure flight is 70% likely to be at least 15 minutes late, leaving you with no less than 34 minutes to spare. You are at risk of missing your flight connection!

<https://bit.ly/crunchedconnection>

Processed Flight Data: 6,000 city pairs, 7M flights a year



Severe weather impacts
100,000 flights annually

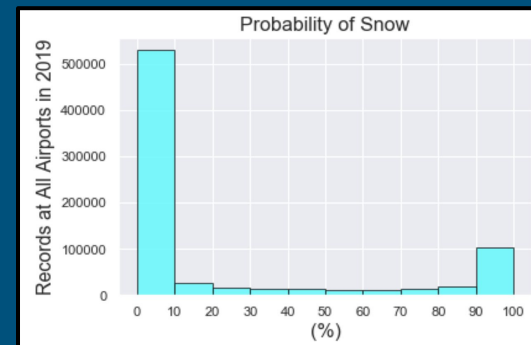
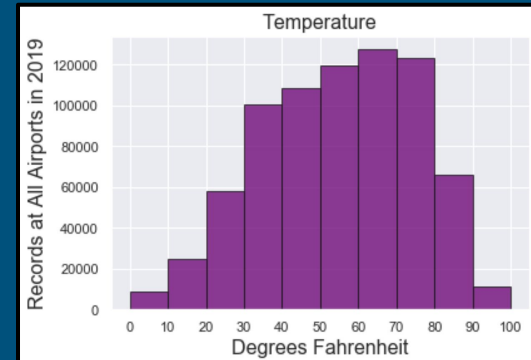
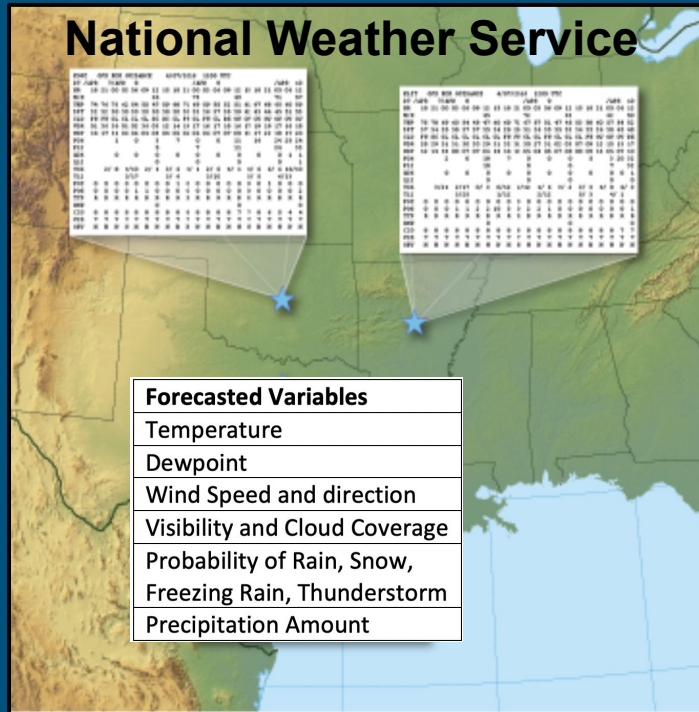
matplotlib

pandas

$$y_i = \beta^T x_i + \mu_i + \epsilon_i$$



Paired Flight Records with Airport Weather Forecasts



Weather forecasts at departure and arrival airports merged with 2017-2019 flight data

Machine learning can prevent you from getting stranded at the airport!

20 flight and weather features



Probability of precipitation
and thunderstorms important

imblearn resampling



random forest

Binary classification
(on-time, over 15 minutes late)

Metrics	Result
Macro-averaged precision	0.86
Macro-averaged F1	0.77

Next time you travel, use **Crunched Connection!**

Enter your upcoming flight details into **Crunched Connection** to find out how likely you are to miss your flight connection because of severe weather.





Maria Zatko

Atmospheric Sciences Ph.D
Senior Air Quality Consultant



Extra:

Flight Itinerary Details

Select Main Carrier

Carrier

Alaska Airlines

Select Departure Information

Departure Airport

SEA

Connecting Airport

TUS

Date

2019/12/31

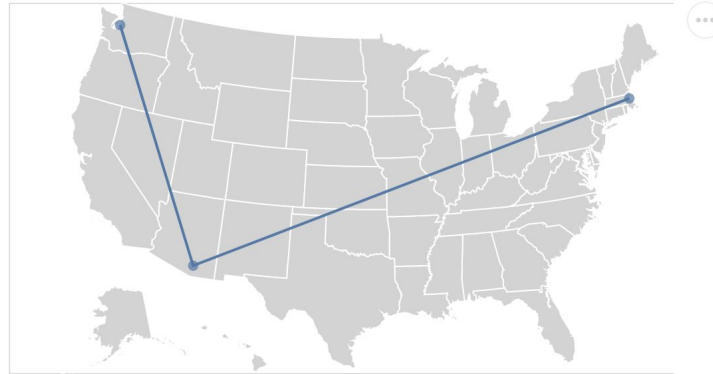
Scheduled Departure Time

Hour (Local)

9

Crunched Connection

Use this tool several days before your flights to determine if severe weather will impact your connection.



You have 0 hours and 49 minutes to make your connection in TUS.

User input now being ingested into machine learning algorithm...

Your departure flight is 70% likely to be at least 15 minutes late, leaving you with no less than 34 minutes to spare. You are at risk of missing your flight connection!

Flight Itinerary Details

Select Main Carrier

Carrier

Alaska Airlines

Select Departure Information

Departure Airport

SEA

Connecting Airport

DEN

Date

2019/12/31

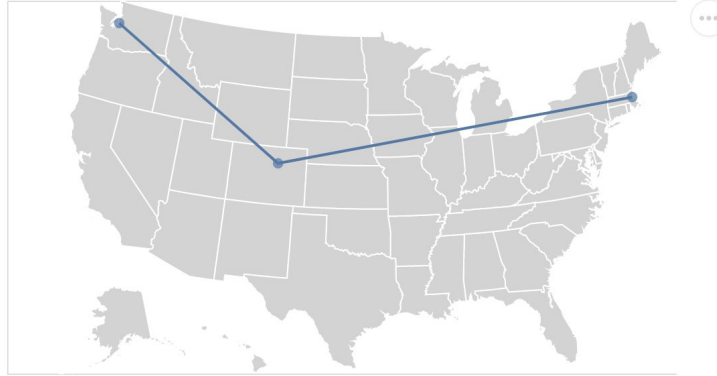
Scheduled Departure Time

Hour (Local)

9

Crunched Connection

Use this tool several days before your flights to determine if severe weather will impact your connection.



You have 0 hours and 49 minutes to make your connection in DEN.

User input now being ingested into machine learning algorithm...

Your departure flight is unlikely to be impacted by severe weather. There is a 0% chance that severe weather will impact your flight connection.