The Estimation of Flight Delays and Layovers on the U.S. Economy

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1 Problem

Flight delay is a serious and widespread problem in the United States. Increasing flight delays place a significant strain on the US air travel system and cost airlines, passengers, and society atmany billions of dollars each year. [1]

The cost of domestic flight delays puts a $32.9 billion dent into the U.S. economy, of the total costs, $16.7 billion, or just over half the cost, was borne by passengers, the study found. This number was calculated based on lost passenger time due to flight delays, cancellations and missed connections, plus expenses such as food and accommodations that are incurred from being away from home for additional time.[2]

A study now in progress follows up on the findings of scientists at Dartmouth College, MIT and the University of Texas at Austin, which concluded that although the average flight delay is 15 minutes, this translates into an average half-hour holdup for passengers because of missed connections and cancellations.[3]Therefore, compared to previous delay prediction, we focus more on the itinerary trip instead one-way trip.

2 Method

Firstly, we need to select relevant feature to be better for our classification. We consider an itinerary to be a sequence of connecting flights that represents a one-way trip, including scheduled departure, connection (if any), and arrival times Flight Day of Month, Year, Week. Planned Departure Time, Planned Connection Time, Planned Arrival Time, Actual Departure Time, Actual Connection Time, Actual Arrival Time. Since we want to constrain explicitly the output variable to be a number between 0 and 1, we will apply a sigmoid function to the output predicted by the method.. The suitable set of techniques includes: networks Gaussian, processes, k-nearest neighbor, neural network.

3 Dataset

The U.S. Bureau of Transportation Statistics (BTS) provides a wealth of data related to airline travel (Bureau of Transportation Statistics 2010). [4]

4 Timeline

Date	Progress
by Oct 16	Finish the feature selection, familiar with the relevant machine learning algorithm
by Oct 28	Code the classification algorithm , train the data set and evaluate the result
By Nov 18	Optimize algorithm, finish system integration, UI development,

5 References

1. Belobaba, P., A. Odoni and C. Barnhart (eds.), The Global Airline Industry, John Wiley & Sons, London, 2009
2. http://newscenter.berkeley.edu/2010/10/18/flight_delays/
3. http://www.washingtonpost.com/lifestyle/travel/if-a-flights-delayed-could-it-be-that-the-passengers-are-at-fault/2014/09/25/3b0bc424-4361-11e4-b437-1a7368204804_story.html
4. Evans, T., V. Vaze, and C. Barnhart (2014). Airline-Driven Performance-Based Air Traffic Management: Game Theoretic Models and Multi-Criteria Evaluation. In press. Transportation Science.