

Here is a 3-paragraph summary of the paper:

This paper proposes a gradient boosting decision tree model for predicting the time until pushback of flights at U.S. airports. Accurate pushback time predictions can yield better predictions of takeoff time, which is important for efficient air traffic management. The authors extracted a rich feature set from weather data, airport activity data, airline data, and aircraft characteristics to train their models.

When evaluating their approach on data from 10 major U.S. airports, the authors found that training separate local models for each airport was more computationally efficient than training a single global model, while achieving comparable mean absolute error (MAE) of around 10.7 minutes on the validation data. This represents a substantial improvement over a baseline approach of simply subtracting 15 minutes from the estimated departure time.

Key features important for accurate prediction included the estimated departure time, the time elapsed since the flight was first tracked, expected airport departures/arrivals in certain time windows, aircraft type, airline carrier, and temporal features like month and hour. The authors' approach placed 4th in the 2023 "Pushback to the Future" competition hosted by NASA.