The paper titled "Predicting Time to Pushback of Flights in U.S. Airports" by Daniil Filienko et al. addresses the challenge of predicting the pushback time of flights, which is crucial for efficient air traffic management. The authors propose a gradient boosting decision tree model that leverages a comprehensive feature set including weather conditions, airport activity, airline, and aircraft characteristics. Their model, trained on data from 10 U.S. airports, shows that training local models per airport is more memory efficient and yields comparable mean absolute error (MAE) to a global model trained on combined data. Their approach was successful in the 2023 “Pushback to the Future” competition hosted by NASA.

The study details the construction of the feature set and the machine learning pipeline. It emphasizes the importance of various features such as the estimated time of departure (ETD), aircraft type, and airport busyness. The data preprocessing involved handling missing values and encoding categorical features. The models were trained and evaluated on a large dataset encompassing 3.8 million flights. The results showed that the local model approach not only provided significant computational efficiency but also achieved low MAE, demonstrating the model's effectiveness in improving pushback time predictions.

The paper concludes with insights on the practical application of their models, noting that local models per airport are both effective and efficient. The authors suggest future work in developing a federated learning solution to incorporate sensitive airline data, which could further enhance prediction accuracy. They acknowledge the support of NASA, DrivenData, and Microsoft Azure for their contributions to the study.