Here is a concise 3-paragraph summary of the paper:

<paragraph 1> This paper presents a machine learning approach to predict the time until pushback of flights at U.S. airports. Accurate pushback time predictions can yield more accurate predictions of takeoff time, which is important for efficient air traffic management. The authors developed gradient boosting decision tree models trained on a rich feature set containing data about weather, airport activity levels, airline characteristics, and aircraft characteristics. They evaluated their approach on a large dataset spanning 10 U.S. airports.

 </paragraph 2> The authors found that training separate local models for each airport was more computationally efficient than training a global model across all airports, while achieving similar predictive performance. Their feature engineering process identified the estimated time of departure, flight lifespan, expected upcoming departures, and previous taxi times as some of the most important features. The models were able to substantially outperform a baseline approach of simply assuming pushback occurs 15 minutes before the estimated departure time.

</paragraph 3> The authors' approach placed among the top solutions in the 2023 "Pushback to the Future" competition hosted by NASA. Key directions for future work include integrating additional proprietary data from airlines through privacy-preserving federated learning techniques. The paper provides insights into effective machine learning strategies for an important aviation prediction task.