

A close-up, low-angle shot of an airplane's wing and engine against a sunset sky. The wing is dark blue and extends from the left towards the right. The engine is a large, dark, cylindrical structure mounted under the wing. The sky is a mix of orange, yellow, and light blue, suggesting a sunset or sunrise. The airplane's fuselage is visible in the background, slightly out of focus.

# Predictive Analysis of US Flight Delays

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Brandon Boyle

20 Jan 2026



# Overview

- The Problem
  - Flight delays disrupts passenger travel and airlines operation cost
- Objective
  - Use historical data to predict if a flight will be delayed
- Proposed Solution
  - Use predictive modeling to estimate chances of delays
  - Based of multiple variables



# Project Idea

- Binary Outcome (Delayed or on-time)
- Use variables like airline, route, day/time, etc.
- Determine what factors lead to delays



# The Dataset

- Bureau of Transportation Statistics
  - U.S. Department of Transportation
- January 2022 – July 2025
- Over 26 million rows
- 10 variables



# Predictive Models

- Random Forest Model
  - Combination of many decision trees
- Gradient Boosting
  - Trees are weighted and made sequentially
- Support Vector Machine
  - Handles marginal relations or finds



# Conclusion

- Main Objective: Predict delayed flights
- Use multiple predictive models
- Find leading factors in delays