Final Project Proposal Group 2

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Introduction

For our final team project, we propose to design a machine learning IoT application using drone flight telemetry and operations log data. This project focuses on analyzing sensors and operational data collected from unmanned aerial vehicles. By applying machine learning techniques to this dataset, we aim to generate insights related to drone performance, operational efficiency, and reliability, and present these insights through a Tableau Public dashboard.

1. What is the source of your dataset?

The dataset used for this project is the "Supplemental Drone Telemetry Data and Operations Log" dataset, which is publicly available on Kaggle. The dataset was created to capture detailed operational and technical information from individual drone flights (Ashad, 2025).

2. How was the data collected?

The data was collected from onboard drone sensors and operational logs during individual flight events. Each flight record includes data captured during flight operations, along with information entered by operators, such as payload details, environmental conditions, and flight outcomes. The data uses drone tasks across multiple applications, including package delivery and aerial photography.

3. How many observations are in the dataset?

The dataset contains multiple flight records, with each row representing a unique drone flight event. Each observation corresponds to a single flight and includes time specific and operational details recorded during that task. There is a total of 555 drone observations recorded. The group believes this should be adequate for our research purposes.

4. What variables are in the dataset?

We believe that some of the more important variables include application type, drone size, model, and manufacturer. Operational variables include number of propellers, maximum and actual carry weight, payload type, altitude, flight duration, and distance traveled. Additional variables capture battery percentage remaining, GPS accuracy, wind speed, obstacles encountered, flight status, regulatory approval ID, flight date, and operator notes. These variables provide a view of drone performance and operating conditions.

5. What is your IoT application/system? Who will use it?

The proposed IoT system is a drone fleet monitoring and analytics platform. In this system, drones act as IoT devices that generate telemetry and operational data during flights. This data is transmitted to a centralized system where machine learning models analyze performance trends, identify abnormal flight behavior, and assess factors that contribute to failed

or inefficient flights. The system would be used by drone operators, fleet managers, and organizations that deploy drones for commercial or industrial purposes.

6. What industry does your IoT application/system fit into?

From the list provided, this application would be for industrial purposes. It relates to how companies and organizations use connected devices, like drones, to collect data and improve operations, safety, and planning. We are thinking it could be useful for things including delivery services and safety checks.

Dataset

Ashad, S. (2025). *Supplemental drone telemetry data and operations log*. Kaggle. https://www.kaggle.com/datasets/samsudeenashad/supplemental-drone-telemetry-data-and-operations-log