# Anomaly Detection Analysis and Results

GitHub Repository:

https://github.com/Arif2455/AI_Anomaly_Detection_Hackathon

Figure 1: Sample of AFeedStream1 :

This plot shows the first 500 data points of the variable AFeedStream1. It provides an overview of the raw signal fluctuations, establishing a baseline of how the data behaves under normal operating conditions without anomaly markers.
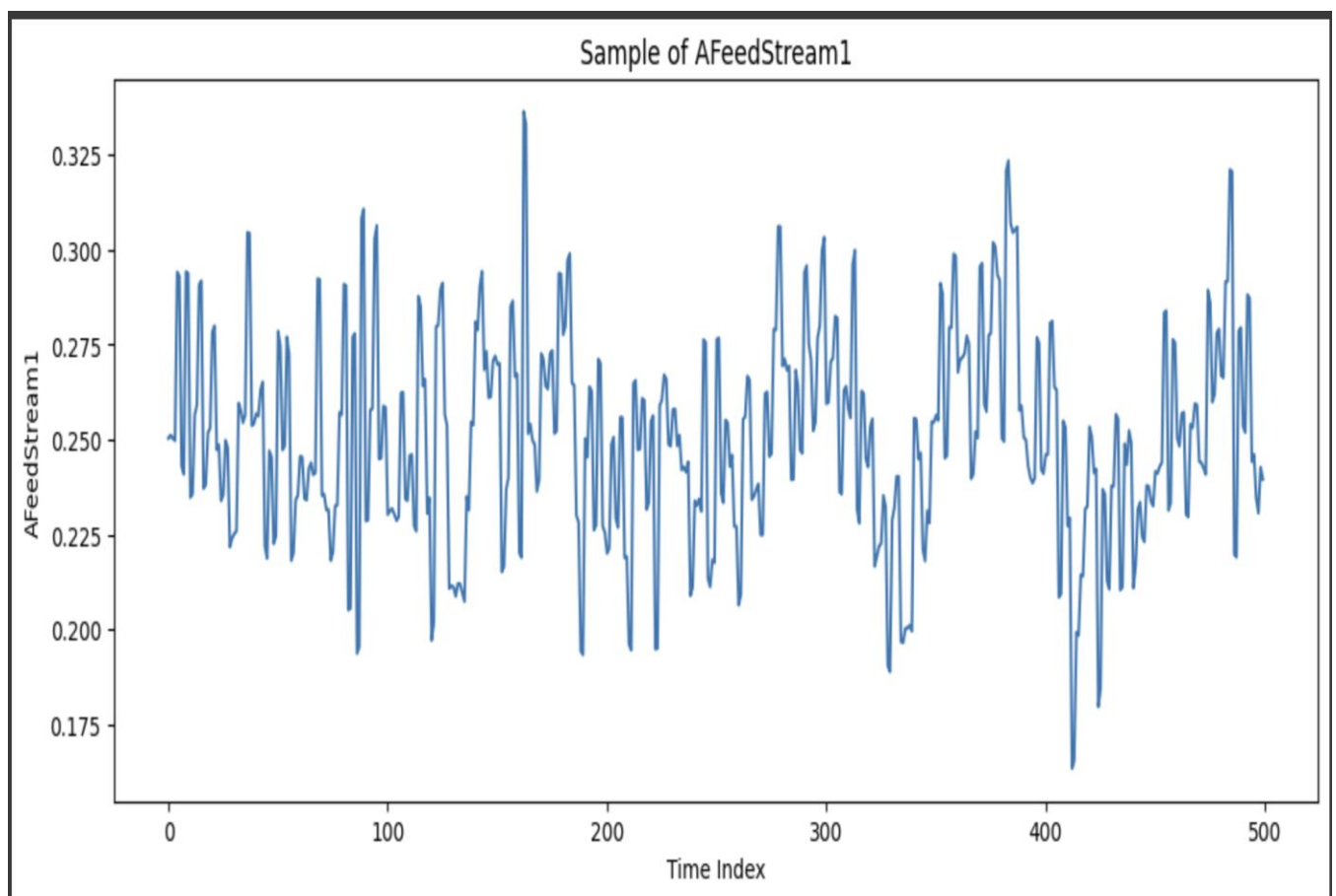
Figure 2: Anomaly Detection in AFeedStream1 :

This visualization highlights the anomalies detected in the same variable (AFeedStream1). The blue line represents the raw data, while the red points indicate anomalies flagged by the detection algorithm.
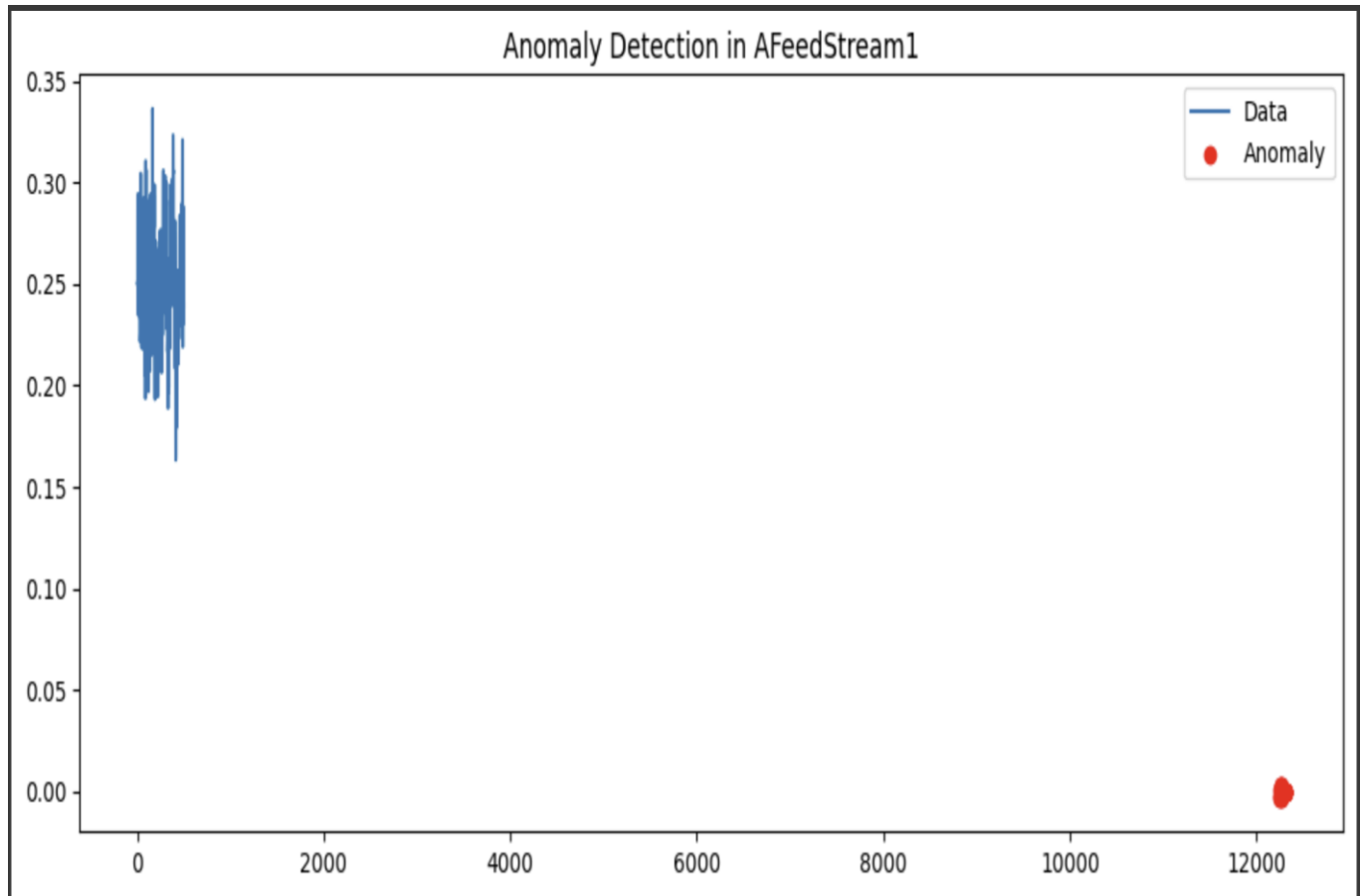
Figure 3: Extended Anomaly Detection in AFeedStream1 :

This plot extends the anomaly detection to the first 1000 data points. The blue line represents the process signal, while the red dots indicate anomalies. Compared to Figure 2, this wider range reveals clusters of anomalies, showing potential abnormal operating regions in the dataset.
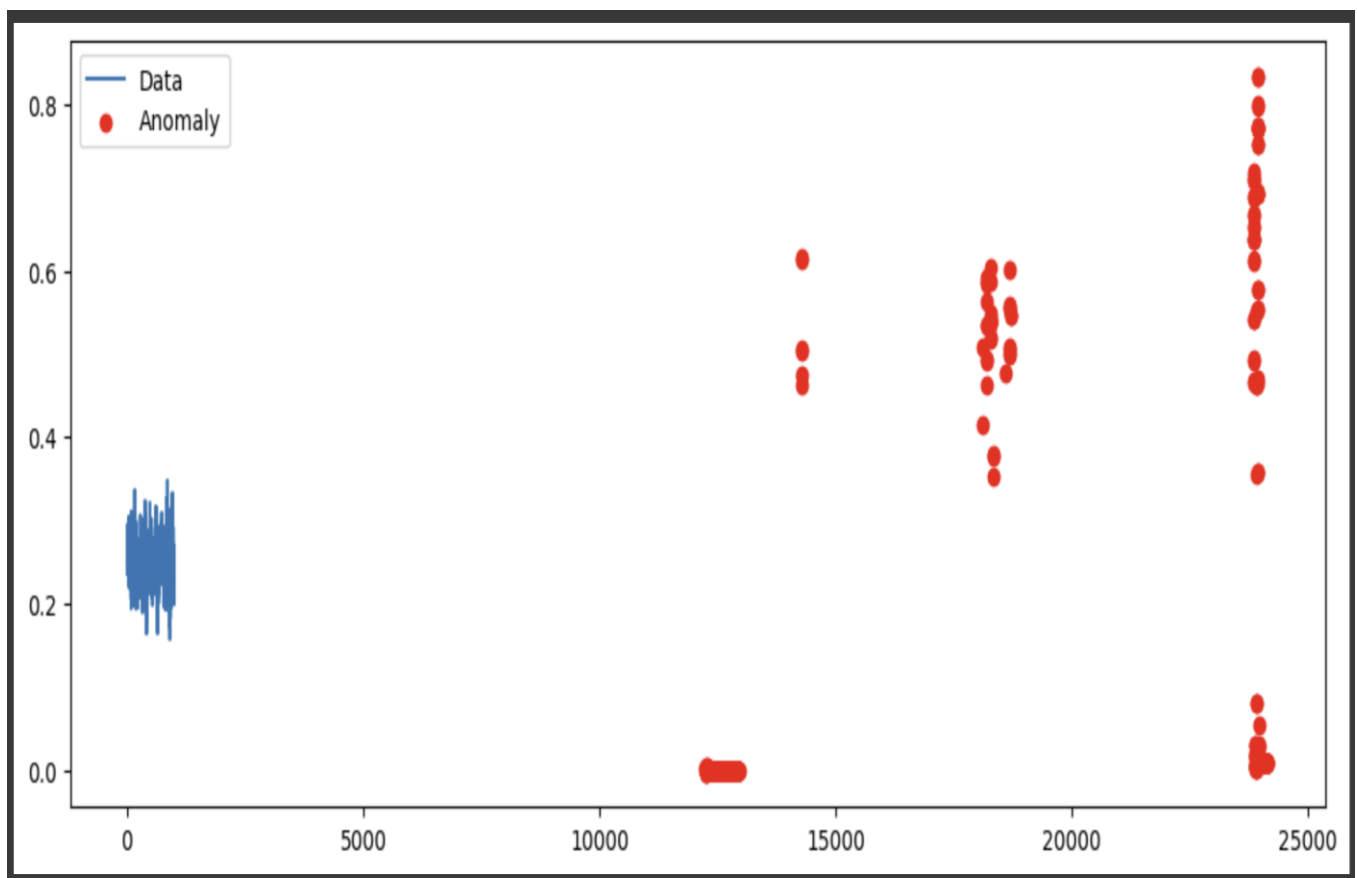
Figure 4: Normal vs Anomalous Flights :

This bar chart compares the distribution of normal and anomalous flights in the dataset. Green represents normal flights, while red represents anomalous flights. The imbalance shows the typical skew in anomaly detection problems.
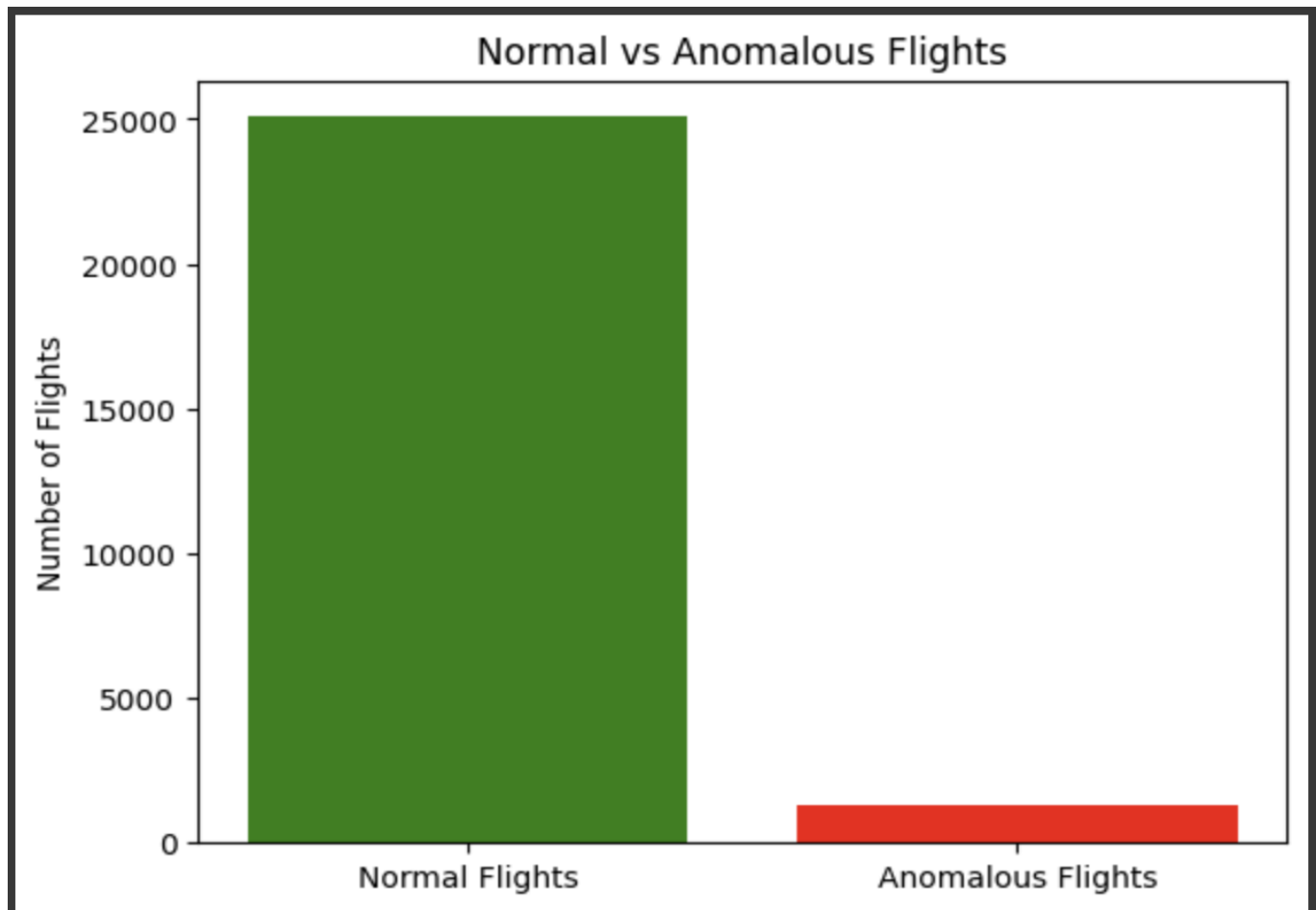
Figure 5: Multivariate Anomaly Detection on Key Process Variables :

This figure presents anomaly detection across three critical process variables: Reactor Temperature, Reactor Pressure, and Compressor Work. The blue lines show the normal operating trends, while the red points highlight anomalous conditions. These deviations indicate possible faults or abnormal plant operations.