

Final Summary of work on Telematics Anomaly Detection

I worked on developing a synthetic telematics data model to simulate and detect anomalies in truck telematics datasets. The project began with generating synthetic telematics samples, creating a foundation for testing and validating anomaly detection methods in a controlled environment.

The next step involved data preprocessing and feature engineering, where I carefully selected and engineered the most relevant telematics features that contribute to effective anomaly detection.

I then applied various prediction algorithms for anomaly detection. Initially, these models were tested on labeled datasets to validate their accuracy and reliability. Subsequently, I deployed these models on real-world, unlabeled telematics data to identify anomalies in live scenarios.

In parallel, I conducted in-depth analysis, visualization, and evaluation of the results to understand the behavior and performance of the detection system.

For deployment, I integrated one of the chosen machine learning algorithms into a backend Flask API, facilitating anomaly detection in real-time or batch processing.

To provide an accessible user interface, I developed a Streamlit dashboard. This UI supports interactive exploration of telematics data, filtered anomaly views, and visual route mapping, enabling easy interpretation of results.

Additionally, I leveraged a Large Language Model (LLM) to research and understand telematics datasets comprehensively. This research helped clarify how telematics systems operate in real situations, informed expectations about the nature of anomalies, and supported defining strategies to exclude false positives or irrelevant anomalies.

Beside this, I implemented synthetic dataset generation as a crucial part of the system pipeline, providing reliable, customizable input data for thorough testing and continuous system improvement.

Overall, this work combined synthetic data modeling, advanced anomaly detection algorithms, backend integration, and user-centric visualization to deliver a robust telematics anomaly detection framework.