

EV Fleet Telemetry & OTA Update Management System

(Minor Project with Major Project Continuation)

1. Problem Statement

Electric Vehicle (EV) fleets generate large volumes of real-time telemetry data such as battery status, vehicle speed, temperature, and location. Most academic projects focus only on static dashboards and do not address real-time ingestion, monitoring, alerting, and system scalability. This project aims to bridge the gap between academic learning and real-world connected vehicle systems.

2. Proposed Solution

The proposed system is a modular EV Fleet Management Platform developed in two phases. The minor project focuses on telemetry ingestion and monitoring, while the major project extends the same system to include OTA firmware updates, fleet orchestration, and advanced analytics.

3. Minor Project Scope (6th Semester)

- Vehicle Telemetry Simulator to generate real-time EV data
- Backend service for telemetry ingestion and validation
- Time-series data storage for vehicle telemetry
- Rule-based alert system for vehicle health monitoring
- Web dashboard for live monitoring and visualization

4. Major Project Scope (7th Semester Extension)

- OTA firmware update management with version control
- Fleet-wide update orchestration and rollback handling
- Scalable event-driven architecture
- Advanced analytics and predictive maintenance
- Security, authentication, and access control mechanisms

5. Technology Stack

- Backend: Spring Boot (Java)
- Frontend: React.js
- Database: PostgreSQL / Time-series Database
- Communication: REST / WebSockets / TCP
- Simulation: Python-based vehicle simulator

6. Project Justification

This project demonstrates real-world system design, software engineering lifecycle, and scalability concepts. The phased approach ensures achievable delivery in the minor project while providing a clear and structured expansion path for the major project.

7. Scope Boundary Declaration

The minor project strictly focuses on telemetry ingestion and monitoring. OTA updates, large-scale orchestration, and advanced DevOps automation are part of the major project extension.