NeuroFleetX – AI-Driven Urban Mobility

# 1. Project Overview

NeuroFleetX is a next-generation AI-driven urban mobility platform designed for fleet rental, real-time vehicle tracking, and predictive route optimization.

The system integrates AI, IoT, predictive geo-spatial data, and machine learning to improve fleet management, customer service, and urban mobility efficiency.

Key Highlights:

- Real-time vehicle tracking using Google Maps AI + Leaflet AI.

- Predictive traffic modeling with Machine Learning (Python Microservices / Java ML).

- Role-based Authentication & Authorization (Admin, Driver, Customer).

- AI-enabled Customer Service Models (chatbots, predictive insights).

- Mobile-first enterprise system for fleet managers & employees.

- Live updates with APIs + Email/SMS notifications.

# 2. System Architecture

The project follows a Microservices + Full-Stack Architecture.

Frontend:

- React → User Interface (Customer, Driver, Admin Dashboard).

Backend:

- Spring Boot → Core backend services.

- Spring Security + JWT → Authentication & Role-based Authorization.

- Stark JS → Real-time updates & event-driven notifications.

Database:

- MySQL → Primary relational database for users, fleets, and transactions.

Machine Learning / AI:

- Python Microservices (Flask/FastAPI) or Java ML → Predictive traffic conditions, Route optimization, Customer behavior prediction.

Maps & Location Services:

- Google Maps API → Location-based services, route planning.

- Leaflet AI → Interactive geospatial visualization.

APIs & Integrations:

- Email & Push Notifications → Customer & driver alerts.

- External APIs → Live traffic feeds, fleet monitoring.

# 3. Modules & Features

Authentication & Role Management:

- User registration & login (Admin, Driver, Customer).

- Role-based dashboards & permissions.

- JWT-based authentication.

Fleet Management (Admin & Fleet Manager):

- Add, update, and track vehicles.

- Real-time fleet monitoring.

- Predictive maintenance & alerts.

Driver Module:

- Assigned trips & schedules.

- Optimized route planning.

- Live navigation with Google Maps.

Customer Module:

- Fleet booking & rental system.

- Real-time trip tracking.

- Notifications & payment integration.

AI & Predictive Analytics:

- Predict traffic conditions using ML models.

- Optimize fleet routes dynamically.

- Intelligent chatbot for customer support.

# 4. Tech Stack

Frontend: React, HTML5, CSS3, TypeScript

Backend: Spring Boot, Spring Security, Stark JS

Database: MySQL

AI/ML: Python (Flask/FastAPI) / Java ML

Maps: Google Maps AI, Leaflet AI

Auth: JWT, Spring Security

Other APIs: Email, Push Notifications, Live Updates

# 5. Workflow

1. User Login / Registration → Authentication (Spring Security + JWT).

2. Admin Dashboard → Manage fleets, drivers, customers.

3. Driver Dashboard → Accept trips, optimized route plans.

4. Customer Dashboard → Book fleets, track trips, receive alerts.

5. AI Engine (Microservice) → Predict traffic & recommend best route.

6. Database (MySQL) → Store user, fleet, trip, and analytics data.

7. Maps & API Layer → Provide real-time tracking & updates.

# 6. Future Enhancements

- Integration with IoT sensors for vehicle health monitoring.

- Blockchain-based secure payment system.

- Integration with EV charging stations.

- AI chatbot for 24/7 customer support.

# 7. Conclusion

NeuroFleetX leverages AI, IoT, and modern full-stack development to build a scalable, intelligent, and mobile-first fleet management platform.

With predictive analytics, real-time tracking, and user-focused modules, it aims to revolutionize urban mobility and fleet rental services.