# Infosys Springboard Virtual Internship 6.0 Completion Report

Batch Number :- 11

Start date :- 29/12/2025

Names: Mohamednishar, Swetha, Vijaya sri, Uday Pratap Singh, Madhumitha,Meghna

Internship Duration: 8 Weeks

## 1. Project Title

**NeuroFleetX AI Powered Urban Fleet and Traffic Intelligence**

## 2. Project Objective

NeuroFleetX is a next-generation AI-driven platform designed to optimize urban mobility and fleet operations for rental, transport, and smart city use cases. By leveraging artificial intelligence, IoT, and geospatial data, NeuroFleetX enables real time vehicle tracking, intelligent routing, predictive maintenance, dynamic fleet allocation, and customer-centric service models. The system integrates machine learning models to predict traffic conditions, optimize route plans, and monitor vehicle health. It also employs advanced dashboards and mobile-first interfaces for fleet managers and end-users. Designed for scalability, NeuroFleetX can be adapted for electric vehicle (EV) fleets, ride-sharing models, or multi-modal transport networks, offering both operational efficiency and sustainable mobility solutions for modern cities.

## 3. Project description in detail

NeuroFleetX is a next-generation urban mobility intelligence system designed for smart city transportation, logistics companies, and vehicle rental services.The platform integrates AI, telemetry simulation, and real-time analytics to monitor fleet performance, predict maintenance, and optimize route planning.

- **Approach**: The system was developed using a modular architecture with separate components for authentication, fleet monitoring, AI routing, predictive maintenance, booking, and analytics.
  The development followed a structured workflow:
  Requirement analysis and system design
  Backend API development using Spring Boot
  Frontend dashboard implementation
  AI module integration
  Testing and deployment

- **Technology Used:**

  - Frontend: React / Angular
  - Backend: Java Spring Boot
  - Database: MySQL
  - AI Services: Python Flask / ML algorithms
  - Maps API: Google Maps / Leaflet
  - Authentication: JWT & Spring Security
  - Charts: Chart.js / Recharts

- **Real-World Impact: In** an era where personalized learning and competency-based assessment are critical, SkillForge provides a practical solution for bridg ing educationd gaps. It empowers Instructors to create engaging, multimedia-rich courses while reducing assessment burden through AI-assisted quiz generation. Students benefit from interactive learning experiences and rigorous AI-driven evaluation that assesses deep understanding rather than rote memorization. The platform democratizes quality education while maintaining institutional standards through robust admin oversight and analytics.

## 4. Timeline Overview

| Week | Activities Planned | Activities Completed |
|---|---|---|
| Week 1 | Requirement analysis & system design | Done |
| Week 2 | User Authentication & Role-Based Access Control Setup | Done |
| Week 3 | Fleet inventory & telemetry | Done |
| Week 4 | AI route optimization module | Done |
| Week 5 | Predictive maintenance module | Done |
| Week 6 | Booking & recommendation system | Done |
| Week 7 | Admin dashboard & analytics | Done |
| Week 8 | Testing & final deployment | Done |

## 5a. Key Milestones

| **Milestone** | Description | Date Achieved |
|---|---|---|
| Project Kickoff | Official start of the project and finalization of requirements. | 29/12/2025 |
| Prototype | Authentication, role-based access control, and initial dashboard layouts were fully operational. | 10/01/2026 |
| Mid Review | AI routing & maintenance working | 19/01/1026 |
| Final Submission | All modules integrated | 29/01/2026 |
| Presentation | Final demo completed | 11/02/2026 |

## 5b. Project execution details

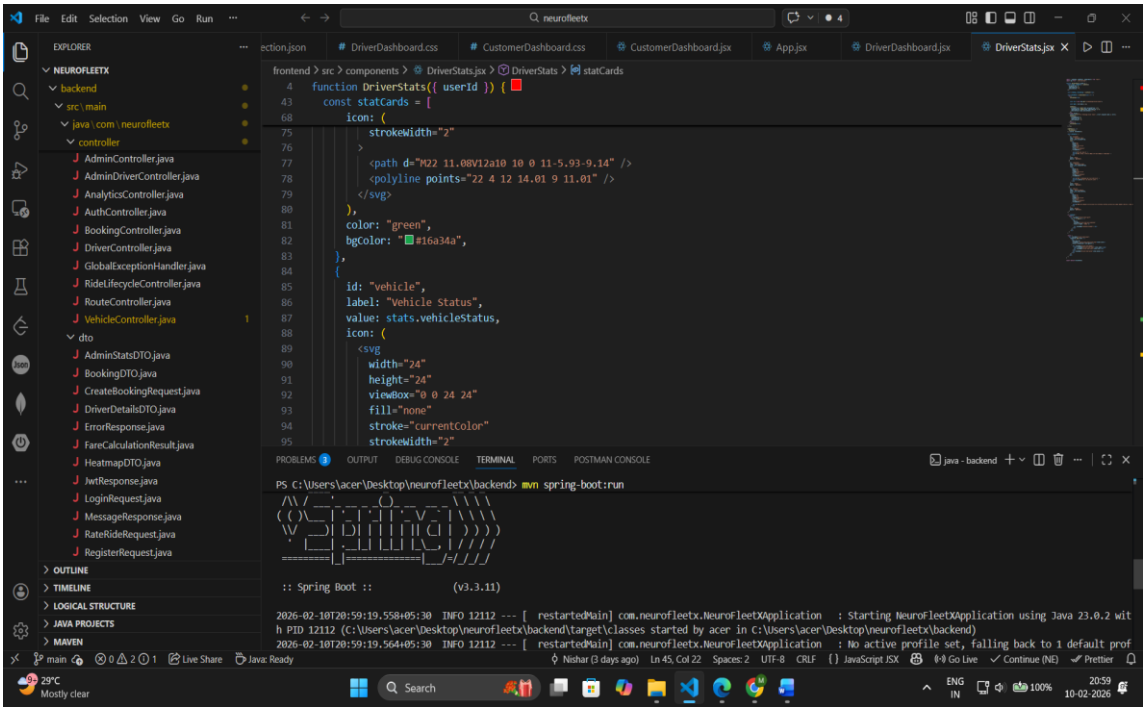
The project was executed by following the planned, week-wise module implementation schedule. The team adopted a layered architectural approach as detailed in the workflow diagram:

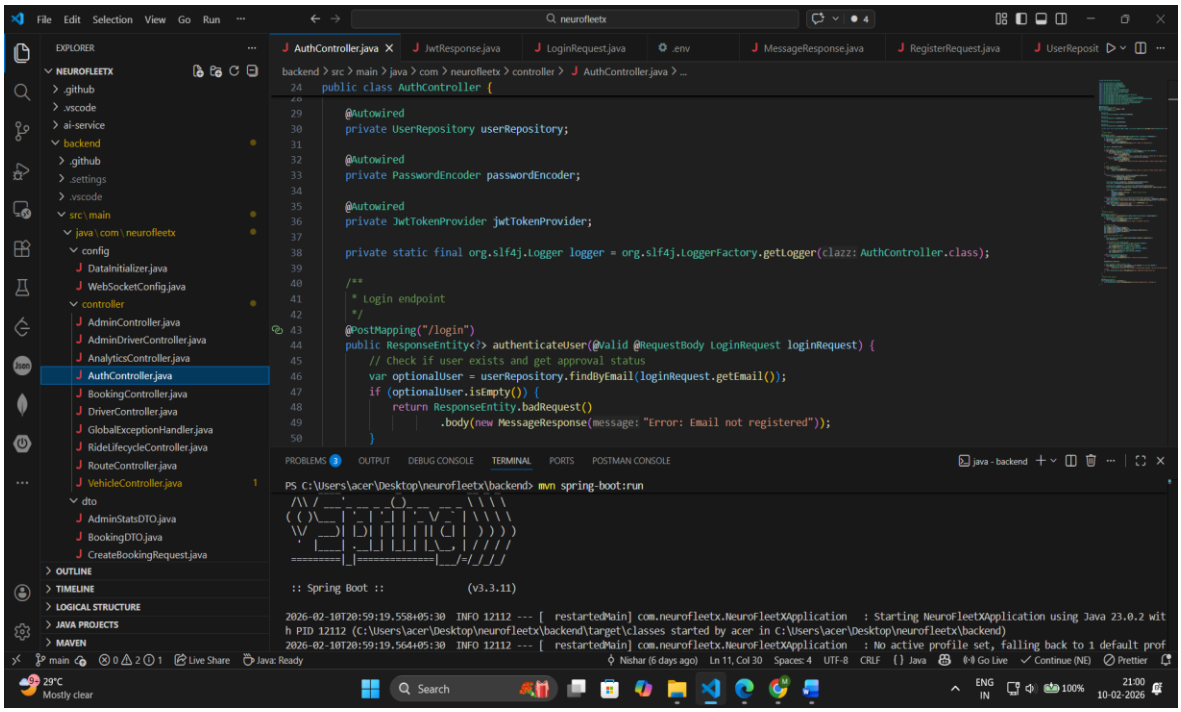
1. User Interface (UI): Developed using React/Angular dashboards for Admin, Manager, Driver, and Customer roles.
2. API Layer: Spring Boot REST APIs handle authentication, vehicle management, booking, and analytics.
3. Backend Logic: AI routing, predictive maintenance, and booking recommendation logic implemented.
4. Database: MySQL stores vehicle data, users, bookings, and telemetry logs.

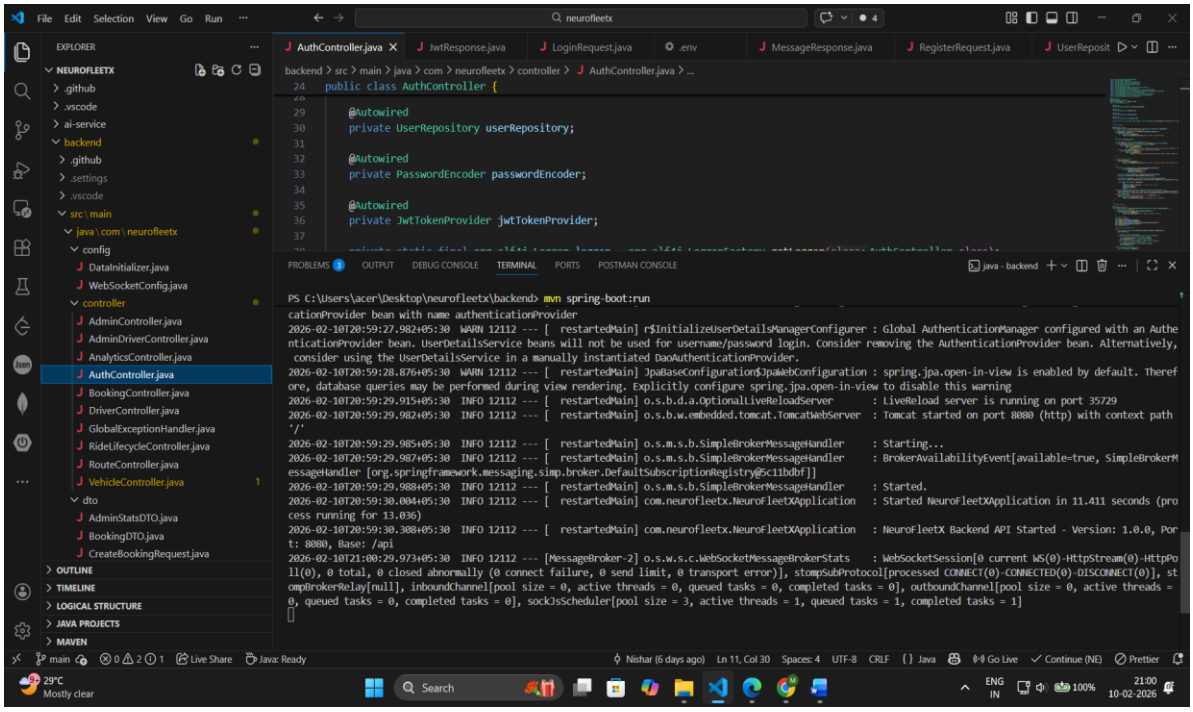
5. **External Services:** Maps API for routing and WebSockets for live tracking updates.

## 6. Snapshots / Screenshots

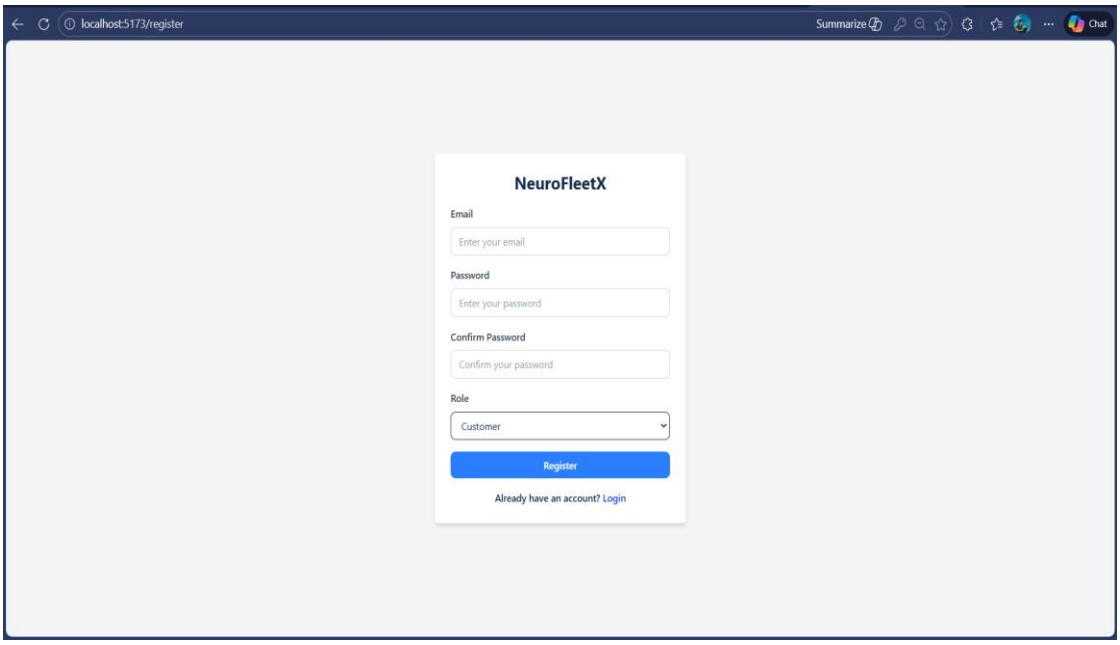
**Backend Code**



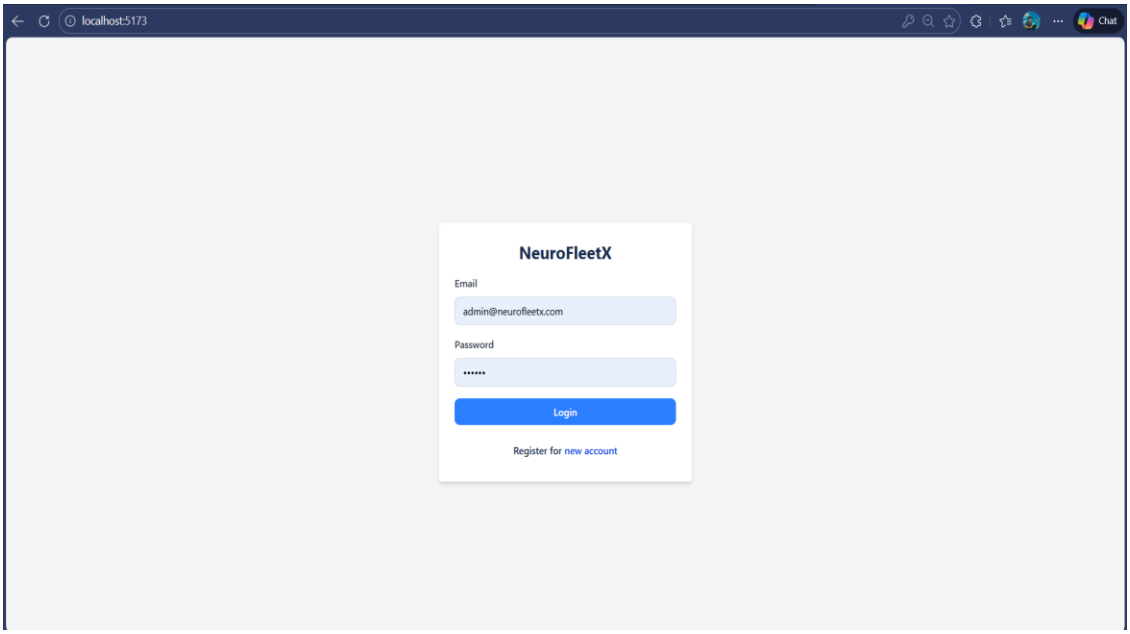

File Edit Selection View Go Run
neurofleetx
EXPLORER
NEUROFLEETX
AuthController.java
JwtResponse.java
LoginRequest.java
.env
MessageResponse.java
RegisterRequest.java
backend > src > main > java > com > neurofleetx > controller > AuthController.java > ...
public class AuthController {
@Autowired
private UserRepository userRepository;
@Autowired
private PasswordEncoder passwordEncoder;
@Autowired
private JwtTokenProvider jwtTokenProvider;
private static final org.slf4j.Logger logger = org.slf4j.LoggerFactory.getLogger(clazz: AuthController.class);
/**
* Login endpoint
*/
@PostMapping("/login")
public ResponseEntity<?> authenticateUser(@Valid @RequestBody LoginRequest loginRequest) {
// Check if user exists and get approval status
var optionalUser = userRepository.findByEmail(loginRequest.getEmail());
if (optionalUser.isEmpty()) {
return ResponseEntity.badRequest()
.body(new MessageResponse(message: "Error: Email not registered"));
}
PROBLEMS 3
OUTPUT
DEBUG CONSOLE
TERMINAL
PORTS
POSTMAN CONSOLE
java - backend
PS C:\Users\acer\Desktop\neurofleetx\backend> mvn spring-boot:run
:: Spring Boot :: (v3.3.11)
2026-02-10T20:59:19.558+05:30 INFO 12112 --- [ restartedMain] com.neurofleetx.NeuroFleetXApplication : Starting NeuroFleetXApplication using Java 23.0.2 with PID 12112 (C:\Users\acer\Desktop\neurofleetx\backend\target\classes started by acer in C:\Users\acer\Desktop\neurofleetX\backend)
2026-02-10T20:59:19.564+05:30 INFO 12112 --- [ restartedMain] com.neurofleetx.NeuroFleetXApplication : No active profile set, falling back to 1 default prof
OUTLINE
TIMELINE
LOGICAL STRUCTURE
JAVA PROJECTS
MAVEN
main
Live Share
Java: Ready
Nishar (6 days ago)
Ln 11, Col 30
Spaces: 4
UTF-8
CRLF
Java
Go Live
Continue (NE)
Prettier
29°C
Mostly clear
Search
ENG
IN
100%
21:00
10-02-2026


File Edit Selection View Go Run
neurofleetx
AuthController.java
JwtResponse.java
LoginRequest.java
.env
MessageResponse.java
RegisterRequest.java
backend > src > main > java > com > neurofleetx > controller > AuthController.java > ...
public class AuthController {
@Autowired
private UserRepository userRepository;
@Autowired
private PasswordEncoder passwordEncoder;
@Autowired
private JwtTokenProvider jwtTokenProvider;
PROBLEMS 3
OUTPUT
DEBUG CONSOLE
TERMINAL
PORTS
POSTMAN CONSOLE
java - backend
PS C:\Users\acer\Desktop\neurofleetx\backend> mvn spring-boot:run
cationProvider bean with name authenticationProvider
2026-02-10T20:59:27.982+05:30 WARN 12112 --- [ restartedMain] r$InitializeUserDetailsManagerConfigurer : Global AuthenticationManager configured with an AuthenticationProvider bean. UserDetailsService beans will not be used for username/password login. Consider removing the AuthenticationProvider bean. Alternatively, consider using the UserDetailsService in a manually instantiated DaoAuthenticationProvider.
2026-02-10T20:59:28.876+05:30 WARN 12112 --- [ restartedMain] JpaBaseConfiguration$JpaWebConfiguration : spring.jpa.open-in-view is enabled by default. Therefore, database queries may be performed during view rendering. Explicitly configure spring.jpa.open-in-view to disable this warning
2026-02-10T20:59:29.915+05:30 INFO 12112 --- [ restartedMain] o.s.b.d.a.OptionalLiveReloadServer : LiveReload server is running on port 35729
2026-02-10T20:59:29.982+05:30 INFO 12112 --- [ restartedMain] o.s.b.w.embedded.tomcat.TomcatWebServer : Tomcat started on port 8080 (http) with context path '/'
2026-02-10T20:59:29.985+05:30 INFO 12112 --- [ restartedMain] o.s.m.s.b.SimpleBrokerMessageHandler : Starting...
2026-02-10T20:59:29.987+05:30 INFO 12112 --- [ restartedMain] o.s.m.s.b.SimpleBrokerMessageHandler : BrokerAvailabilityEvent[available=true, SimpleBrokerMessageHandler [org.springframework.messaging.simp.broker.DefaultSubscriptionRegistry@5c11bdbf]]
2026-02-10T20:59:29.988+05:30 INFO 12112 --- [ restartedMain] o.s.m.s.b.SimpleBrokerMessageHandler : Started.
2026-02-10T20:59:30.004+05:30 INFO 12112 --- [ restartedMain] com.neurofleetx.NeuroFleetXApplication : Started NeuroFleetXApplication in 11.411 seconds (process running for 13.036)
2026-02-10T20:59:30.308+05:30 INFO 12112 --- [ restartedMain] com.neurofleetx.NeuroFleetXApplication : NeuroFleetX Backend API Started - Version: 1.0.0, Port: 8080, Base: /api
2026-02-10T21:00:29.973+05:30 INFO 12112 --- [MessageBroker-2] o.s.w.s.c.WebSocketMessageBrokerStats : WebSocketSession[0 current WS(0)-HttpStream(0)-HttpPoll(0), 0 total, 0 closed abnormally (0 connect failure, 0 send limit, 0 transport error)], stompSubProtocol[processed CONNECT(0)-CONNECTED(0)-DISCONNECT(0)], stompBrokerRelay[null], inboundChannel[pool size = 0, active threads = 0, queued tasks = 0, completed tasks = 0], outboundChannel[pool size = 0, active threads = 0, queued tasks = 0, completed tasks = 0], sockJsScheduler[pool size = 3, active threads = 1, queued tasks = 1, completed tasks = 1]
OUTLINE
TIMELINE
LOGICAL STRUCTURE
JAVA PROJECTS
MAVEN
main
Live Share
Java: Ready
Nishar (6 days ago)
Ln 11, Col 30
Spaces: 4
UTF-8
CRLF
Java
Go Live
Continue (NE)
Prettier
29°C
Mostly clear
Search
ENG
IN
100%
21:00
10-02-2026

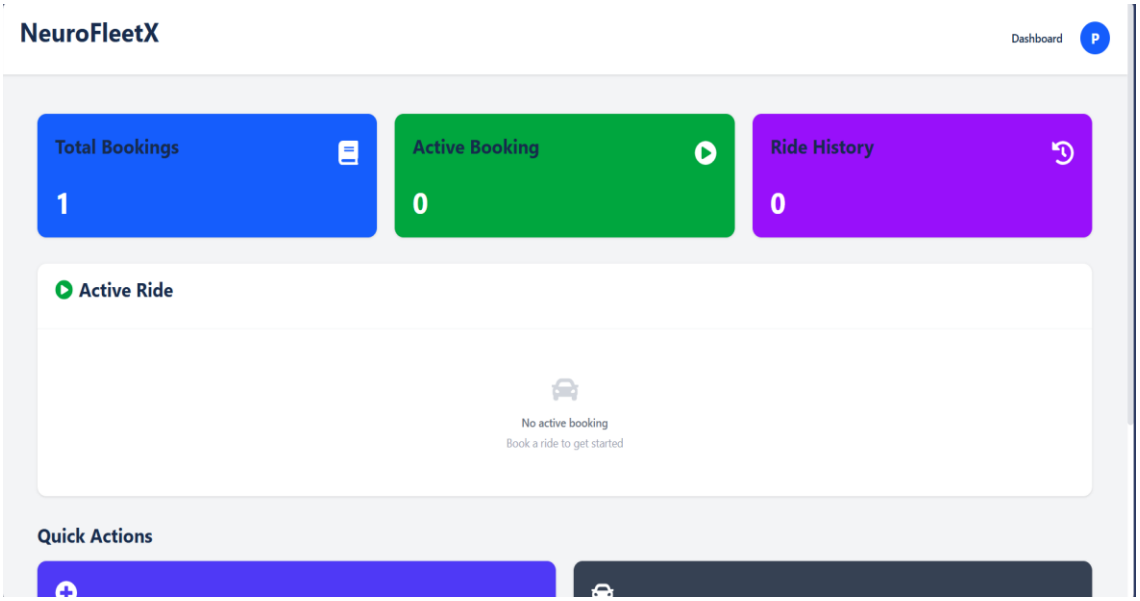
## Register Page:



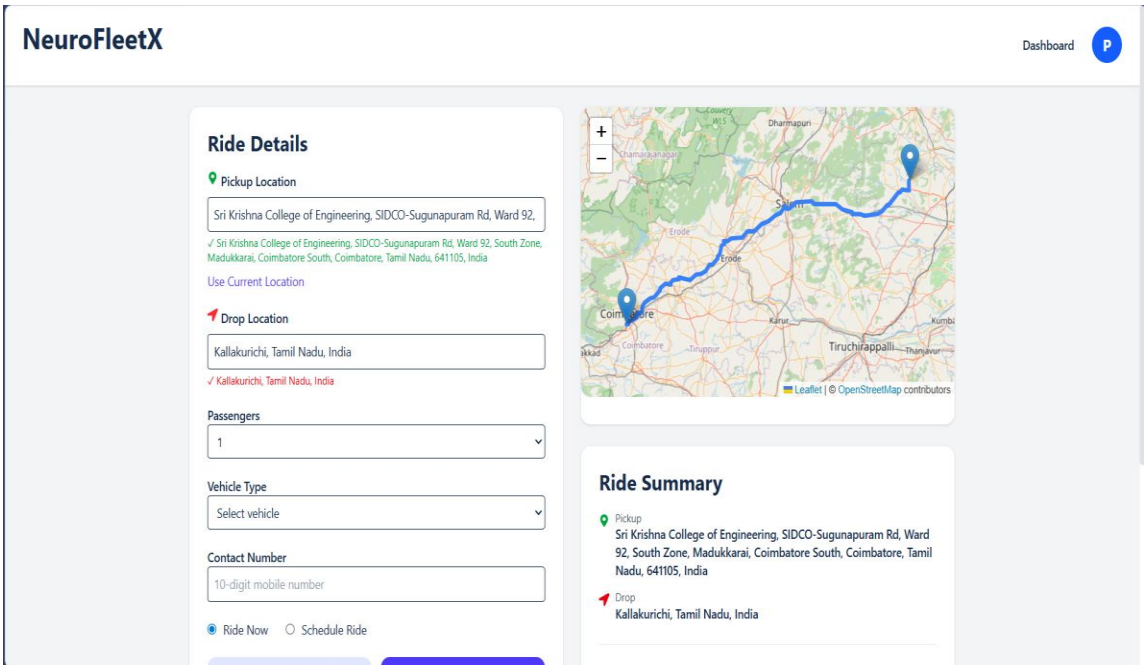

## Login Page:

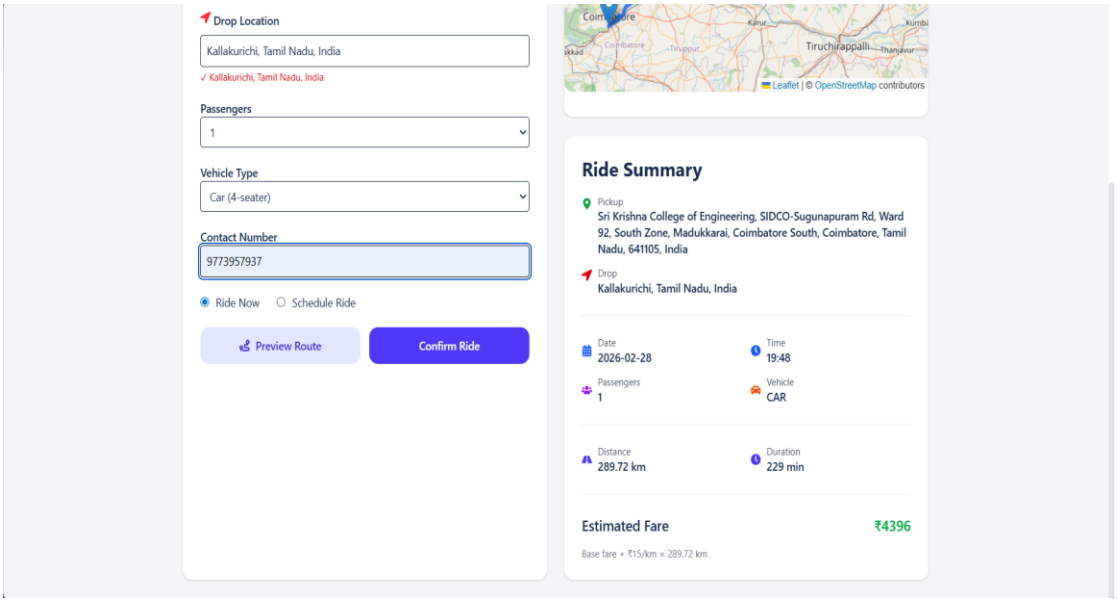


## Customer Dashboard:

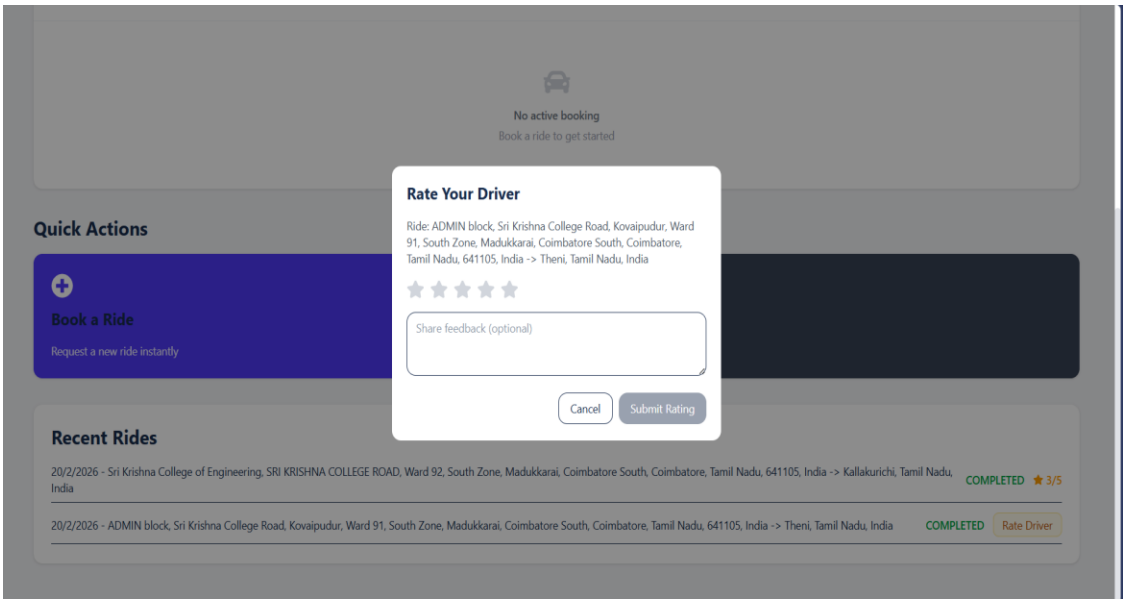


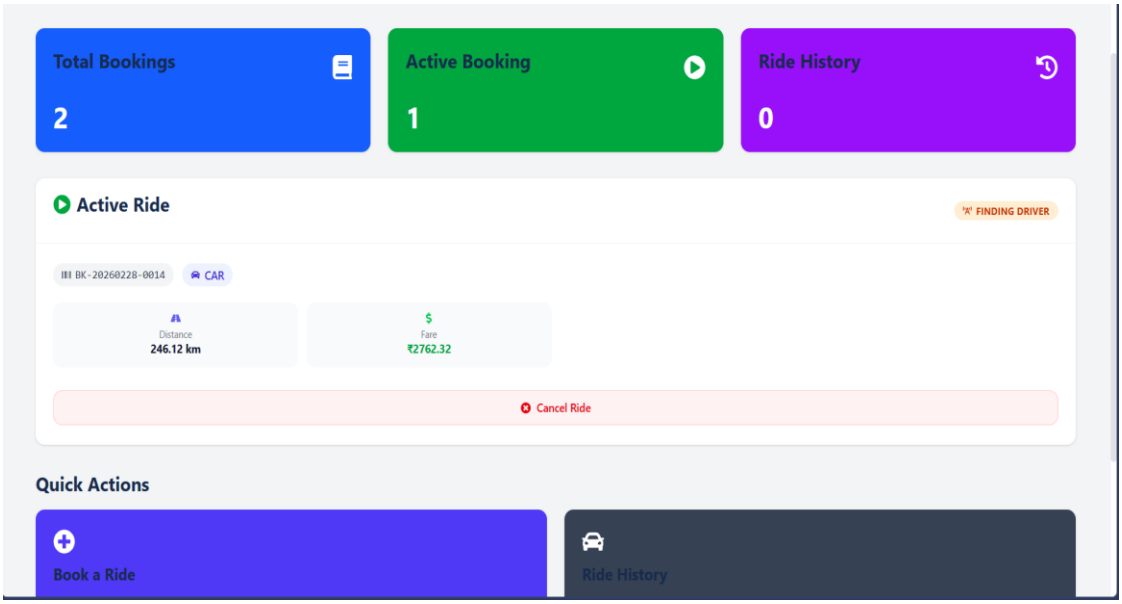

## Booking Page:



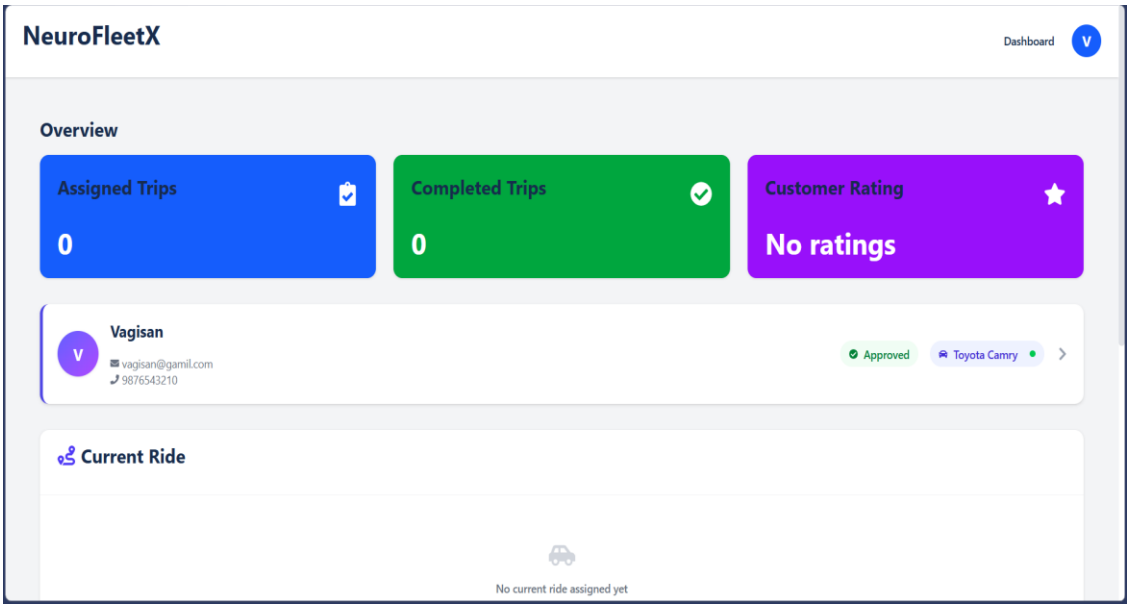


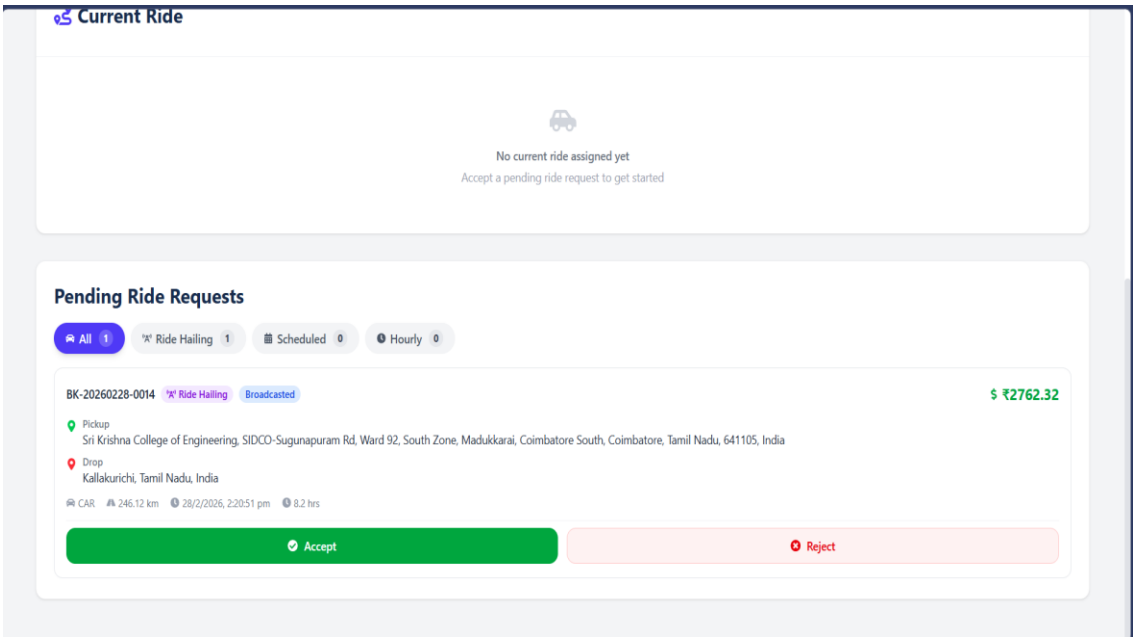

## Customer Feedback:

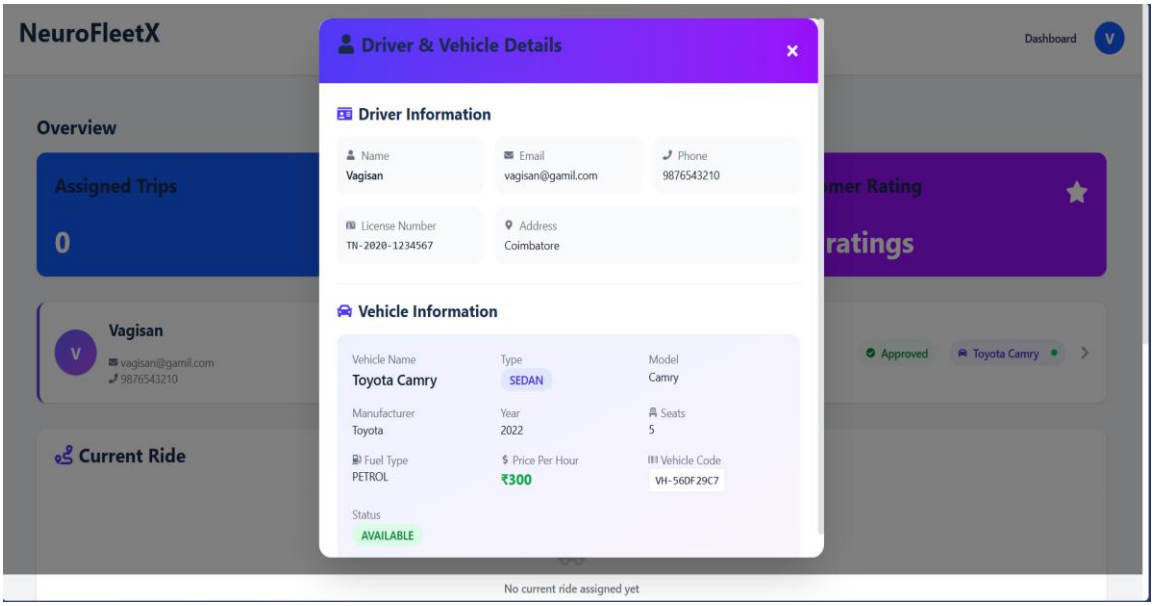




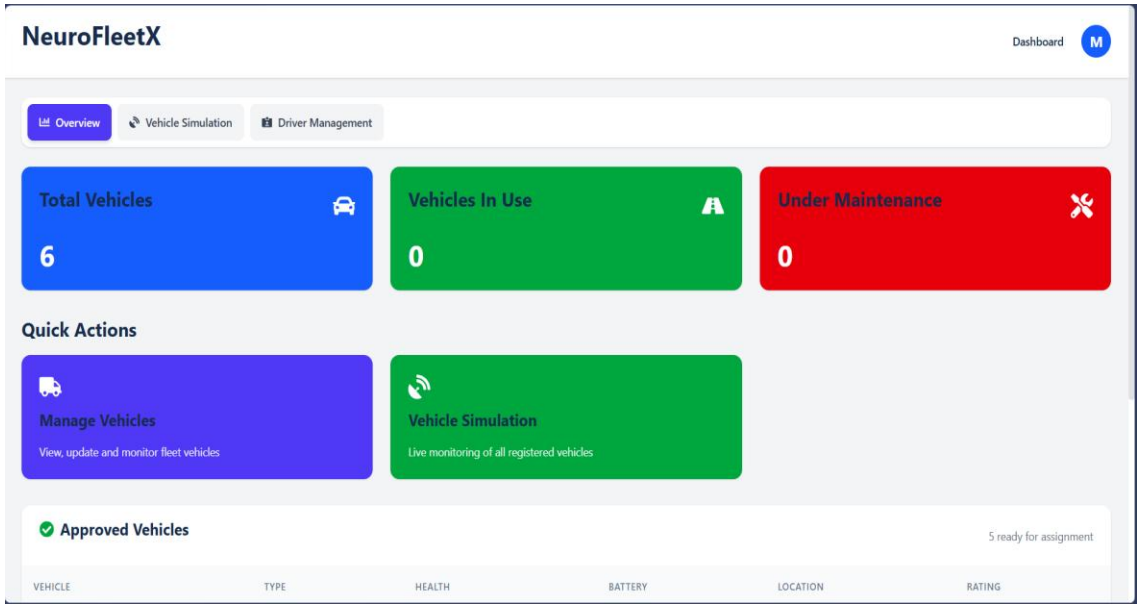

## Driver Dashboard:

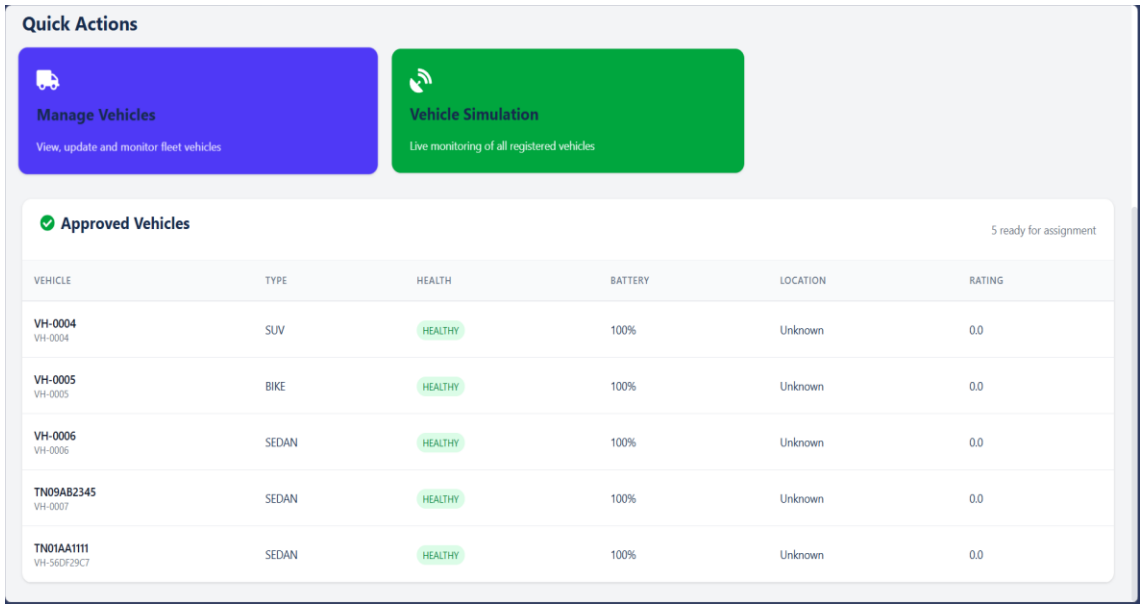


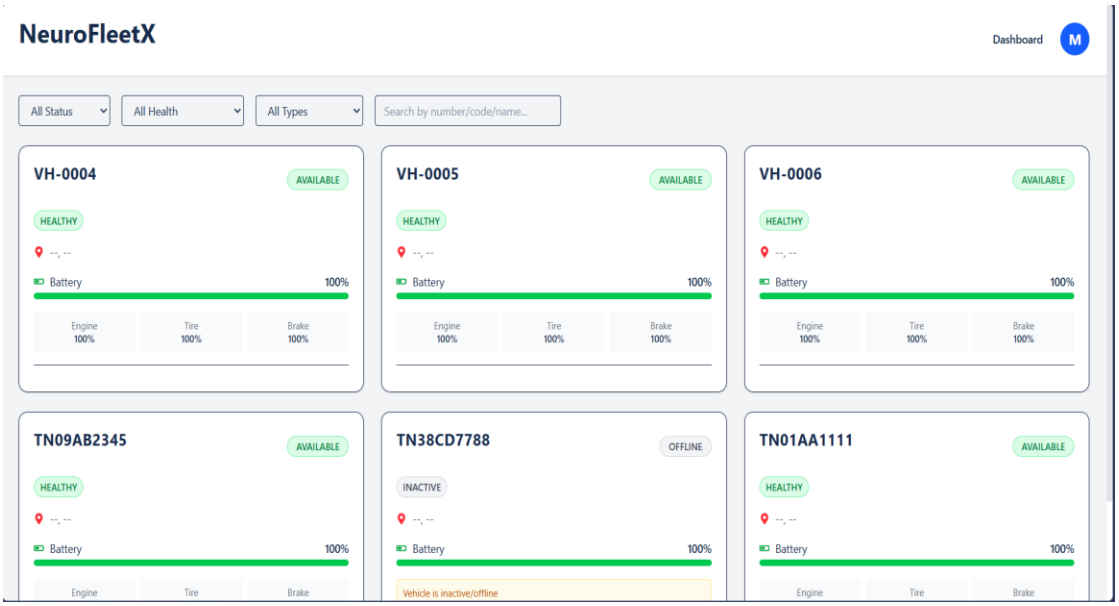

Current Ride
No current ride assigned yet
Accept a pending ride request to get started
Pending Ride Requests
All 1
Ride Hailing 1
Scheduled 0
Hourly 0
BK-20260228-0014
Ride Hailing
Broadcasted
$ ₹2762.32
Pickup
Sri Krishna College of Engineering, SIDCO-Sugunapuram Rd, Ward 92, South Zone, Madukkarai, Coimbatore South, Coimbatore, Tamil Nadu, 641105, India
Drop
Kallakurichi, Tamil Nadu, India
CAR
246.12 km
28/2/2026, 2:20:51 pm
8.2 hrs
Accept
Reject

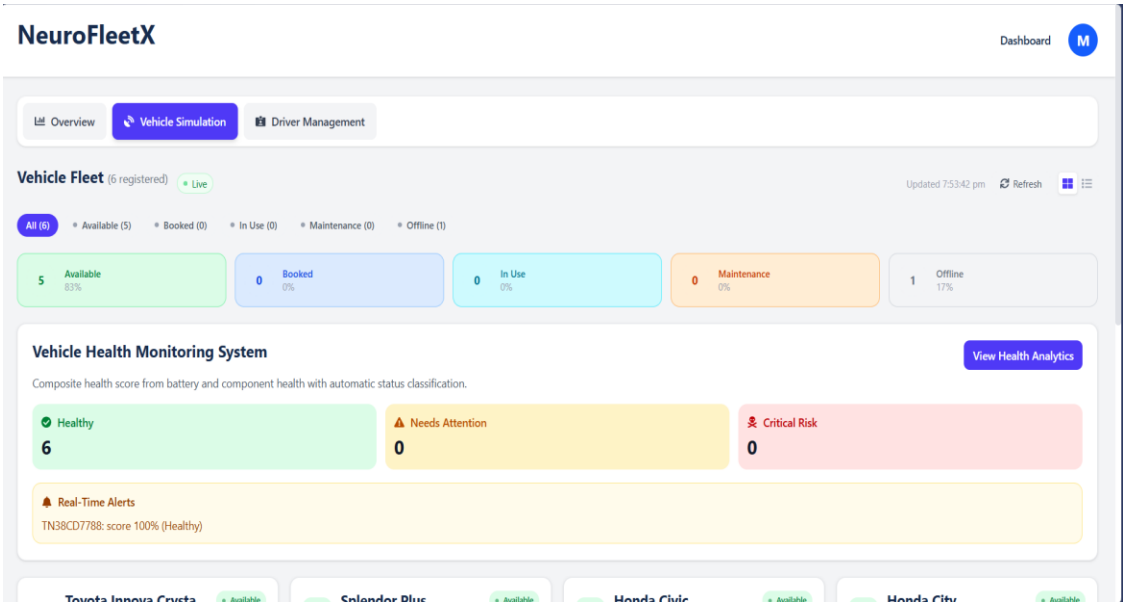

NeuroFleetX
Dashboard
Overview
Assigned Trips
0
Vagisan
vagisan@gamil.com
9876543210
Current Ride
Driver & Vehicle Details
Driver Information
Name
Vagisan
Email
vagisan@gamil.com
Phone
9876543210
License Number
TN-2020-1234567
Address
Coimbatore
Vehicle Information
Vehicle Name
Toyota Camry
Type
SEDAN
Model
Camry
Manufacturer
Toyota
Year
2022
Seats
5
Fuel Type
PETROL
Price Per Hour
₹300
Vehicle Code
VH-560F29C7
Status
AVAILABLE
Approved
Toyota Camry
No current ride assigned yet

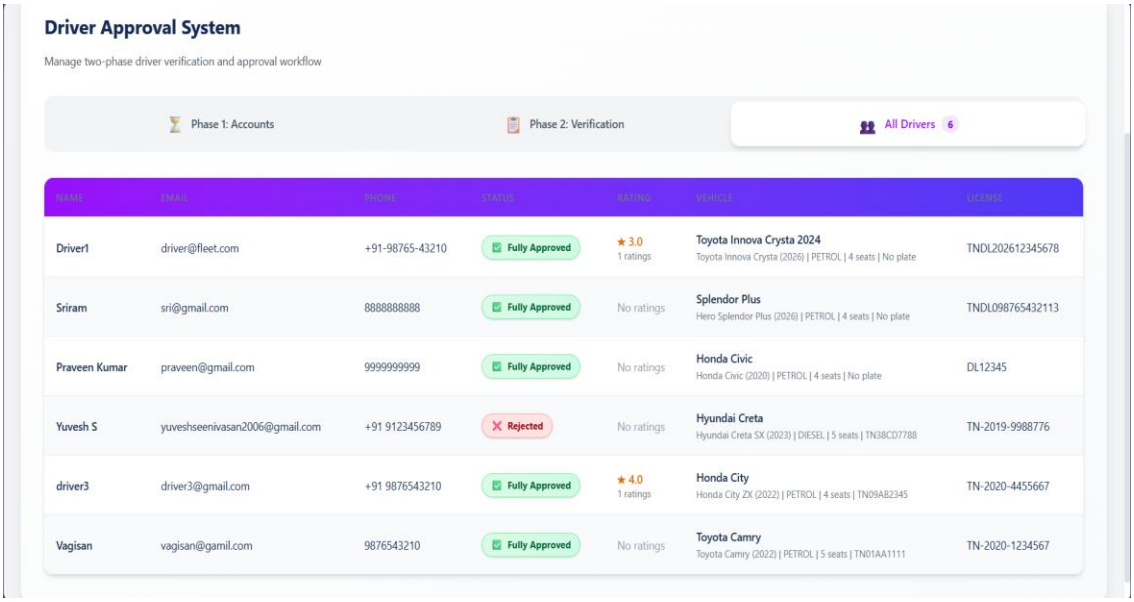
# Fleet Manager Dashboard:



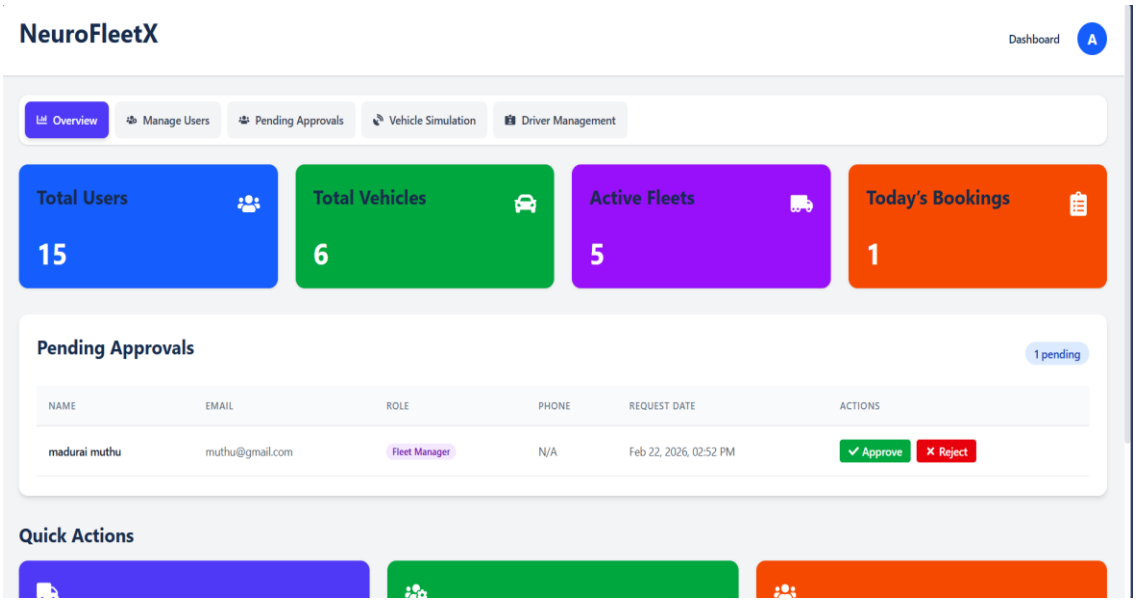



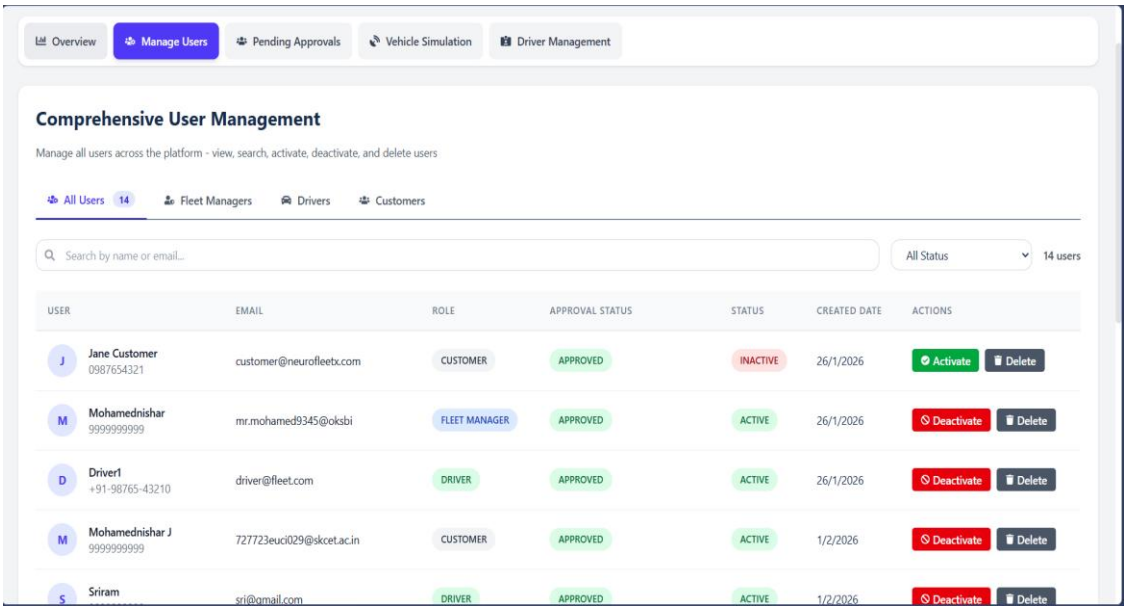

NeuroFleetX
Dashboard
M
All Status
All Health
All Types
Search by number/code/name...
VH-0004
AVAILABLE
HEALTHY
--, --
Battery
100%
Engine
100%
Tire
100%
Brake
100%
VH-0005
AVAILABLE
HEALTHY
--, --
Battery
100%
Engine
100%
Tire
100%
Brake
100%
VH-0006
AVAILABLE
HEALTHY
--, --
Battery
100%
Engine
100%
Tire
100%
Brake
100%
TN09AB2345
AVAILABLE
HEALTHY
--, --
Battery
100%
TN38CD7788
OFFLINE
INACTIVE
--, --
Battery
100%
Vehicle is inactive/offline
TN01AA1111
AVAILABLE
HEALTHY
--, --
Battery
100%

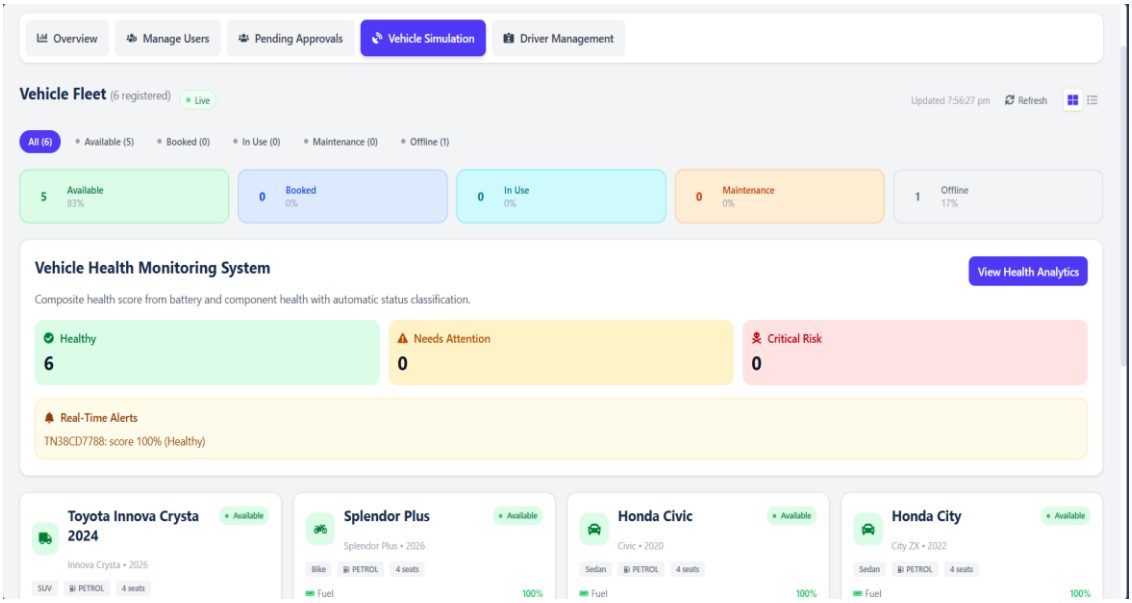

NeuroFleetX
Dashboard
M
Overview
Vehicle Simulation
Driver Management
Vehicle Fleet (6 registered)
Live
Updated 7:53:42 pm
Refresh
All (6)
Available (5)
Booked (0)
In Use (0)
Maintenance (0)
Offline (1)
5
Available
83%
0
Booked
0%
0
In Use
0%
0
Maintenance
0%
1
Offline
17%
Vehicle Health Monitoring System
View Health Analytics
Composite health score from battery and component health with automatic status classification.
Healthy
6
Needs Attention
0
Critical Risk
0
Real-Time Alerts
TN38CD7788: score 100% (Healthy)

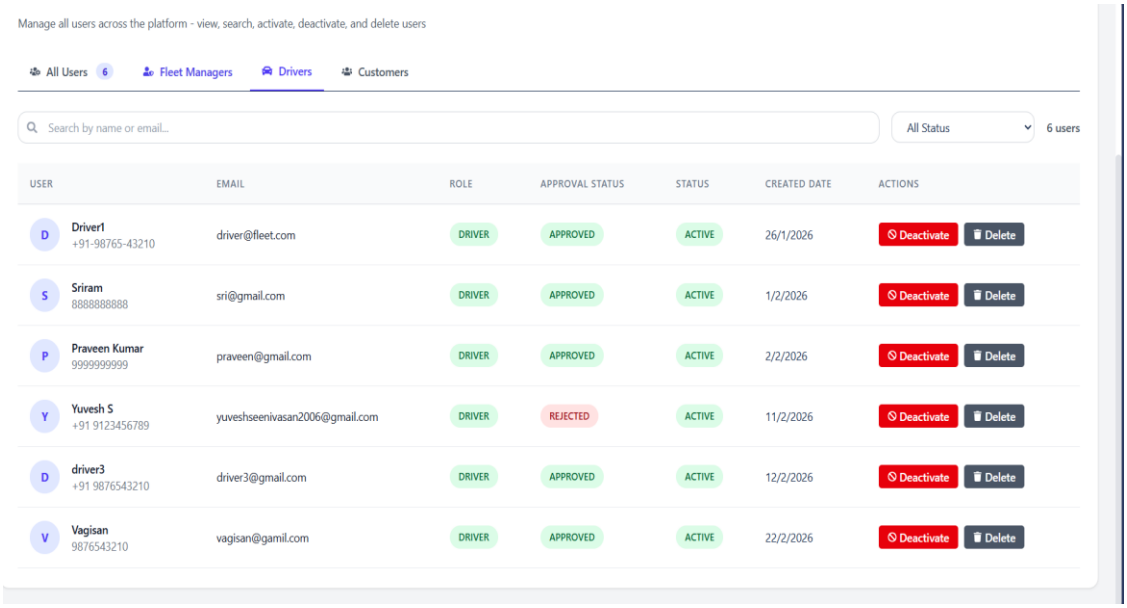


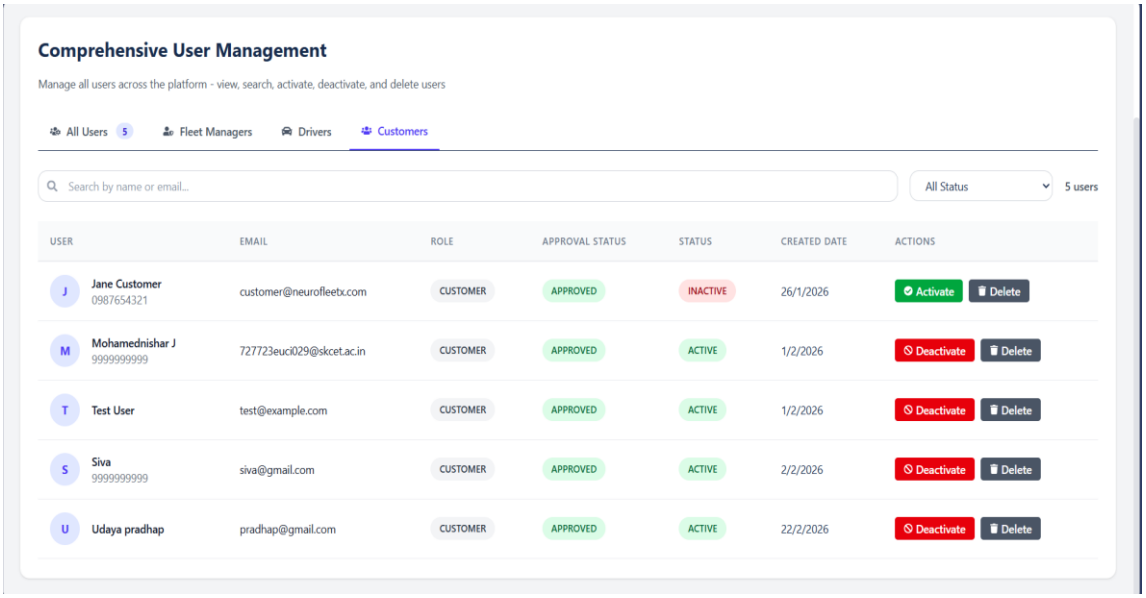

## Admin Dashboard:




Overview
Manage Users
Pending Approvals
Vehicle Simulation
Driver Management
Comprehensive User Management
Manage all users across the platform - view, search, activate, deactivate, and delete users
All Users 14
Fleet Managers
Drivers
Customers
Search by name or email...
All Status
14 users
USER
EMAIL
ROLE
APPROVAL STATUS
STATUS
CREATED DATE
ACTIONS
Jane Customer
0987654321
customer@neurofleetx.com
CUSTOMER
APPROVED
INACTIVE
26/1/2026
Activate
Delete
Mohamednishar
9999999999
mr.mohamed9345@oksbi
FLEET MANAGER
APPROVED
ACTIVE
26/1/2026
Deactivate
Delete
Driver1
+91-98765-43210
driver@fleet.com
DRIVER
APPROVED
ACTIVE
26/1/2026
Deactivate
Delete
Mohamednishar J
9999999999
727723euci029@skcet.ac.in
CUSTOMER
APPROVED
ACTIVE
1/2/2026
Deactivate
Delete
Sriram
sri@gmail.com
DRIVER
APPROVED
ACTIVE
1/2/2026
Deactivate
Delete


Overview
Manage Users
Pending Approvals
Vehicle Simulation
Driver Management
Vehicle Fleet (6 registered)
Live
Updated 7:56:27 pm
Refresh
All (6)
Available (5)
Booked (0)
In Use (0)
Maintenance (0)
Offline (1)
5 Available 83%
0 Booked 0%
0 In Use 0%
0 Maintenance 0%
1 Offline 17%
Vehicle Health Monitoring System
View Health Analytics
Composite health score from battery and component health with automatic status classification.
Healthy
6
Needs Attention
0
Critical Risk
0
Real-Time Alerts
TN38CD7788: score 100% (Healthy)
Toyota Innova Crysta 2024
Available
Innova Crysta • 2026
SUV
PETROL
4 seats
Splendor Plus
Available
Splendor Plus • 2026
Bike
PETROL
4 seats
Fuel
100%
Honda Civic
Available
Civic • 2020
Sedan
PETROL
4 seats
Fuel
100%
Honda City
Available
City ZX • 2022
Sedan
PETROL
4 seats
Fuel
100%


Manage all users across the platform - view, search, activate, deactivate, and delete users
All Users 6
Fleet Managers
Drivers
Customers
Search by name or email...
All Status
6 users
USER
EMAIL
ROLE
APPROVAL STATUS
STATUS
CREATED DATE
ACTIONS
Driver1 +91-98765-43210 driver@fleet.com DRIVER APPROVED ACTIVE 26/1/2026 Deactivate Delete
Sriram 8888888888 sri@gmail.com DRIVER APPROVED ACTIVE 1/2/2026 Deactivate Delete
Praveen Kumar 9999999999 praveen@gmail.com DRIVER APPROVED ACTIVE 2/2/2026 Deactivate Delete
Yuvesh S +91 9123456789 yuveshseenivasan2006@gmail.com DRIVER REJECTED ACTIVE 11/2/2026 Deactivate Delete
driver3 +91 9876543210 driver3@gmail.com DRIVER APPROVED ACTIVE 12/2/2026 Deactivate Delete
Vagisan 9876543210 vagisan@gamil.com DRIVER APPROVED ACTIVE 22/2/2026 Deactivate Delete


Comprehensive User Management
Manage all users across the platform - view, search, activate, deactivate, and delete users
All Users 5
Fleet Managers
Drivers
Customers
Search by name or email...
All Status
5 users
USER
EMAIL
ROLE
APPROVAL STATUS
STATUS
CREATED DATE
ACTIONS
Jane Customer 0987654321 customer@neurofleetx.com CUSTOMER APPROVED INACTIVE 26/1/2026 Activate Delete
Mohamednishar J 9999999999 727723euci029@skcet.ac.in CUSTOMER APPROVED ACTIVE 1/2/2026 Deactivate Delete
Test User test@example.com CUSTOMER APPROVED ACTIVE 1/2/2026 Deactivate Delete
Siva 9999999999 siva@gmail.com CUSTOMER APPROVED ACTIVE 2/2/2026 Deactivate Delete
Udaya pradhap pradhap@gmail.com CUSTOMER APPROVED ACTIVE 22/2/2026 Deactivate Delete

## 7. Challenges Faced

While the project progressed smoothly, we encountered several technical and design challenges:

- **AI Route Optimization Accuracy**: Implementing AI-based route prediction and traffic-aware navigation required careful tuning to ensure accurate ETA calculations and optimal route suggestions. We resolved this by refining algorithms, validating results with simulated traffic data, and continuously improving prediction logic through iterative testing.
- **Real-Time Vehicle Tracking & Data Synchronization:** Handling real-time telemetry such as vehicle location, speed, and status across multiple dashboards required robust synchronization between frontend and backend. We addressed this by using WebSockets for live updates and optimizing database transactions to maintain consistency across sessions.
- **Predictive Maintenance Modeling:** Designing a predictive maintenance system using simulated vehicle health data required defining realistic thresholds for alerts and service predictions. We improved reliability by testing multiple scenarios, adjusting health parameters, and validating predictions against expected vehicle behavior.
- **Map API Integration & Performance Optimization:** Integrating map services for route visualization and fleet tracking required efficient rendering of routes, markers, and heatmaps. Performance issues were resolved by optimizing API calls, caching map data, and reducing unnecessary re-renders in the frontend.
- **Scalable Backend Architecture:** Ensuring the system could handle multiple users, vehicles, and booking requests simultaneously required designing a modular and scalable backend. We implemented RESTful APIs, efficient database indexing, and role-based access control to maintain performance and security.
- **Dashboard Data Visualization:** Displaying large volumes of fleet and analytics data in real time while maintaining a smooth user experience required optimization of chart rendering and data fetching strategies. We addressed this using efficient chart libraries, pagination, and lazy loading techniques.

## 8. Learnings & Skills Acquired

This internship was an immense learning experience. Key skills and knowledge gained include:

- **Technical Skills:** Gained hands-on experience in full-stack development using modern technologies including React/Angular for interactive frontend dashboards and Java Spring Boot with Java for robust backend services. Implemented JWT-based secure authentication with role-based access control, designed and optimized MySQL database schemas for fleet and booking data, integrated Maps APIs for route visualization, and applied AI logic for route optimization, predictive maintenance, and smart vehicle recommendations. Also developed responsive UI dashboards and real-time analytics using chart libraries and WebSockets.
- **Project Management:** Learned to work effectively in a structured development environment by following a modular and milestone-based approach. Practiced planning weekly goals, integrating frontend and backend modules, testing features incrementally, and ensuring smooth coordination between different system components.
- **Problem-Solving:** Improved the ability to debug full-stack issues, resolve API integration errors, optimize database performance, and handle real-time data synchronization challenges. Developed strategies to improve system performance, reduce latency, and ensure data accuracy across dashboards and services.

## 9. Testimonials from team

This project was a fantastic opportunity to apply our academic knowledge to a real-world, impactful platform. Working on the **NeuroFleetX – AI-Driven Urban Fleet & Traffic Intelligence System** from concept to completion was both challenging and highly rewarding. The experience of designing and developing a smart mobility solution that can improve transportation efficiency and fleet operations in modern cities was deeply motivating. The project allowed us to explore real-time data systems, AI integration, and full-stack development while solving practical problems related to route optimization, predictive maintenance, and fleet analytics. The mentorship, continuous feedback, and collaborative teamwork played a crucial role in the successful completion of this project We are proud of the innovative platform we built, which demonstrates how artificial intelligence and data analytics can be effectively integrated into urban mobility systems to create smarter, more efficient, and sustainable transportation solutions.

## 10. Conclusion

The development of the **NeuroFleetX – AI-Driven Urban Fleet & Traffic Intelligence System** culminated in the successful implementation of a comprehensive and scalable smart mobility platform. The project achieved its core objectives by delivering a feature-rich system capable of real-time fleet tracking, intelligent route optimization, predictive maintenance, and data-driven analytics for urban transportation management.

The platform demonstrates how artificial intelligence, geospatial data, and modern full-stack technologies can be integrated to improve fleet efficiency, reduce operational costs, and enhance decision-making for administrators and users. It provides role-based access for administrators, fleet managers, drivers, and customers, creating a complete ecosystem for intelligent fleet operations and smart city mobility.

This experience has been highly valuable in strengthening our understanding of full-stack development, AI integration, real-time systems, and scalable software architecture. The project provided practical exposure to designing and implementing industry-level solutions and has prepared us for future opportunities in software development, intelligent transportation systems, and smart city technologies.

## 11. Acknowledgements

We would like to extend our sincere gratitude to **Infosys Springboard** for providing us with this valuable virtual internship opportunity and for creating a platform that encourages innovation, practical learning, and industry exposure. This experience enabled us to apply our academic knowledge to a real-world, AI-driven system and significantly enhanced our technical and problem-solving skills.

We are especially thankful to our mentor **Mr. Kaviyarasan** for his continuous guidance, support, and constructive feedback throughout the project lifecycle. His insights and technical expertise helped us overcome challenges, refine our system design, and successfully implement the NeuroFleetX platform. His mentorship played a crucial role in strengthening our understanding of full-stack development, AI integration, and real-time system design.

We also express our appreciation to our faculty members and teammates for their collaboration, encouragement, and support during the development of this project. Their contributions and teamwork were essential in completing this project successfully and making this internship a meaningful and enriching learning experience.