

# Manikandan P

ML Engineer & Backend Developer

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## Profile Summary

ML Engineer & Backend Developer with hands-on experience in building machine learning solutions and scalable backend systems. Skilled in applying Generative AI for data generation and developing high-performance REST APIs for real-time and data-driven applications.

## Skills

- **Languages:** Python, Java, SQL, JavaScript
- **Backend Technologies:** Spring Boot, Spring Data JPA, REST APIs, Microservices, WebSocket, Apache Kafka, Redis
- **Machine Learning / AI:** Regression Models, Time-Series Forecasting, Feature Engineering, Data Pre-processing, Model Training, Generative AI
- **Databases:** MySQL, MongoDB
- **Tools & Platforms:** Git, GitHub, Jira, VS Code, Eclipse, Spring Tool Suite, Agile Methodology

## Experience

Tata Elxsi   Software Engineer – ML & Backend Developer	Dec 2024 – Present
<ul style="list-style-type: none"><li>• Designed and developed RESTful APIs using Spring Boot, enabling secure and scalable service integrations.</li><li>• Implemented microservice architecture with inter-service communication (RestTemplate, WebClient), improving modularity and system reliability.</li><li>• Delivered real-time client updates through WebSocket communication and event-driven messaging with Apache Kafka.</li><li>• Enhanced performance by integrating Redis caching, reducing redundant database queries and improving API response times.</li><li>• Developed and validated Machine Learning models for sensor data analysis and prediction, focusing on accuracy, robustness, and real-world applicability.</li><li>• Performed data preprocessing, feature engineering, normalization, and model evaluation to improve prediction performance.</li><li>• Managed issue tracking and resolution using Jira, contributing to sprint planning, code reviews, and unit/regression testing.</li></ul>	

## Projects

### Sensor Virtualization using ML & Generative AI

- Developed ML models to simulate realistic sensor behavior under varying climatic and operational conditions.
- Applied Generative AI techniques to generate synthetic data for unseen conditions, improving data diversity and model robustness.
- Reduced dependency on physical sensor data by enabling virtual sensor simulation for testing and validation.
- Increased model reliability by applying feature engineering and evaluation using RMSE and MAE metrics.

### Battery Health Monitoring System – Java Backend

- Designed and implemented Spring Boot APIs for real-time battery health monitoring and analytics.
- Developed backend logic for processing battery parameters and generating actionable insights.
- Optimized API response time by implementing Redis caching and efficient database query handling.
- Improved system scalability through modular microservices-based backend architecture.

## Education

**B.E., Computer Science & Engineering**  
Karpagam College of Engineering, Coimbatore  
CGPA: 8.7 / 10

2020 – 2024