

SARATH BABU P

Applied Machine Learning Engineer — Data Science & AI Systems

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TECHNICAL EXPERTISE

Programming Languages: Python, C++, SQL, JavaScript, R

Machine Learning & AI: Supervised & Unsupervised Learning, Deep Learning, CNNs, Transfer Learning, Time Series Analysis, Forecasting, Anomaly Detection, Clustering, NLP Fundamentals, Feature Engineering, Model Evaluation

ML Frameworks: scikit-learn, PyTorch, TensorFlow

Data Engineering & MLOps: Large-scale log processing, IoT data pipelines, Streaming data analysis, Model deployment, Batch processing, Data aggregation, Cron-based scheduling, Experiment tracking, Monitoring pipelines

Backend & Databases: MongoDB, Linux, REST APIs for ML inference, Flask, FastAPI

Computer Vision: OpenCV, MediaPipe, YOLO, Image preprocessing, OCR

CS Fundamentals: Data Structures & Algorithms, OOPS, Complexity analysis

Systems & Embedded (Supporting Skills): ROS2, Arduino, ESP32, Raspberry Pi, SLAM, Nav2

Tools: Git, Plotly, Matplotlib

PROFESSIONAL EXPERIENCE

Research and Development Engineer (Product based company)

Mooving (SAR Group) — Aug 2025 – Present

- **Built and maintained ML-driven analytics and automation systems for Battery Swapping infrastructure spanning 700+ live stations and tens of thousands of batteries.**
- **Built an automated Relay Reset System** that periodically audits charging slots every **30 minutes**, performs conditional resets based on slot charging state, and autonomously recovers choked stations, improving uptime stability by **25%**.
- **Led firmware performance analytics** across multiple update cycles—tracking data pattern consistency, swap anomalies, and charging efficiency—enabling proactive firmware validation and anomaly detection.
- **Owned and architected an end-to-end station issue prioritization and routing system** for **600+ live Battery Swapping Stations**, transforming manual field triage into a data-driven optimization problem under real-time operational constraints.
- **Designed and productionized a cluster-aware ML routing pipeline** using **DBSCAN, K-Means, distance matrices, and TSP heuristics (Nearest Neighbor + 2-opt)** with a **Python/Flask/MongoDB** backend, reducing service decision latency and improving first-response efficiency for critical stations by **30%**.
- Automated visualization, data ingestion, and scheduling pipelines using **Python, MongoDB, and cron jobs** for continuous system monitoring and reporting.

Data Science Intern

Livguard Drivetrain Pvt Ltd — Feb 2025 – Jun 2025

- **Engineered scalable analytics pipelines** processing **300M+ IoT logs** and **1.6M+ transactions** from **500+ BSS** across 6 cities; delivered **firmware benchmarking, UPS degradation analysis, and anomaly detection** insights.
- **Automated event classification, SOC pattern analysis, and real-time reporting** using **Python/MongoDB/Plotly**.

Prior Experience:

- **Embedded Intern, Vmake (3 mo)** – Built **12 IoT/robotics projects**, generating **INR 29K profit**; led a **6-member team** on delivery and execution.
- **Web Intern, TIM (3 mo)** – Co-developed **internship portal** with **auth, tracking & search**; scaled to **500+ users**.

KEY TECHNICAL PROJECTS

Advanced ML & Computer Vision Systems

- **Cataract Detection System:** **YOLOv8-based** real-time model achieving **98.1% accuracy** using **Flask/OpenCV/PyTorch** for medical image analysis.
- **Facial Recognition System:** Offline recognition using **Flutter/MediaPipe/TFLite** with **95% accuracy** supporting **100+ user embeddings**.
- **Audio Captioning System:** **CNN-LSTM and Transformer** models with **TensorFlow/Keras** using **VGG16** for audio feature extraction.
- **Document Restoration API:** Image processing pipeline with **gamma correction, filtering, thresholding** for **OCR**.
- **Flight Delay Prediction System:** ML model using **Random Forest and Logistic Regression**; deployed via **Flask API** with **90% accuracy**.

Additional Engineering Projects

- **Autonomous Robotics & Embedded Systems:** Built **ROS2-based autonomous navigation systems** using **SLAM/Nav2** and **image processing**, along with multiple **embedded IoT systems** (gesture-controlled robots, LPG detectors, vitals monitoring) using **Arduino/Raspberry Pi**.
- **Web Application Development:** Developed a **full-stack internship platform** using **React.js** and **WordPress** with user authentication, application tracking, and admin workflows.

ACHIEVEMENTS & RECOGNITION

- **Team Gaia Member, Runner Up, Solar Decathlon India 2024-25:** Developed **net-zero energy building solutions** focused on efficiency optimization.
- **Autobot Competition (2023):** Advanced maze-solving and entertainment robots in competitive robotics environment.

EDUCATION

Degree	Institution	Board / University	Score
B.Tech (CSE)	Atria University	VTU	8.8
Class XII	Sobha Icon HSS	Kerala Board	99.08%
Class X	GHSS Kizhakkencherry	Kerala Board	99.0%