Mohammed Rayan

mohammedrah1289@gmail.com | +91-8105729755 | GitHub | Portfolio | LinkedIn

About Me

An ambitious and hands-on embedded systems enthusiast with a strong foundation in robotics, real-time systems, and AI-powered automation. I specialize in building ROS2-based autonomous systems, smart power automation, and reinforcement learning integration on embedded hardware. I've led award-winning hardware projects and hold key technical positions in IEEE and Team Volante, contributing to innovative sensor-based systems and EV safety electronics.

Education

B.E. in Electronics Engineering
M S Ramaiah Institute of Technology, Bangalore 2023 – Present
CGPA: 8.4

12th Grade – Sir M.V PU College
Percentage: 93.5%

10th Grade – Sri Mahaveer Vidyalaya
Percentage: 96.6%

Skills

Languages: C, C++, Python, MATLAB
Embedded Platforms: Arduino, STM32, ESP32, Raspberry Pi, NVIDIA Jetson
Technologies: ROS, ROS2, SLAM, AMCL, Path Planning, Localization
Sensors: Lidar, Depth Cameras, IMU, Gas Sensors, Current and Voltage sensors, Motor drivers
Other Tools: Git, VS Code, Linux, Flask, Gymnasium, scikit-learn

Technical Projects

Smart Power Home Automation System (CAPE)
Built a full-stack IoT system with real-time monitoring, automated billing, and AI-powered predictive maintenance.
Tools: Arduino, Raspberry Pi, Flask, LightGBM, Sensors
Awarded "Best Hardware Project" at Ignitex, BGSIT.

AURORA – Autonomous Mobile Robot (AMR)
Developed a logistics AMR using ROS2, SLAM (RTAB-Map), and Nav2 stack on Raspberry Pi 5. Features obstacle avoidance, path planning, and sensor fusion.
Tools: ROS2 Humble, 2D Lidar, IMU, Flask UI
Currently working on simulation and SLAM software.

Self-Balancing Robot with Reinforcement Learning (PPO)
Hybrid control robot using PID + PPO. Trained PPO agent on real-world sensor-action data from MPU6050 via Arduino + Raspberry Pi.
Tools: Stable-Baselines3, Gymnasium, Arduino, Python

AI-Powered Corrosion Monitoring System
Real-time corrosion tracking using AD5933 + Raspberry Pi. Logs impedance data and visualizes trends. Future-ready with ML predictions and LoRa integration.
Tools: AD5933, Python, ThingSpeak, TensorFlow Lite (planned)

Positions of Responsibility

Vice Technical Head – IEEE Sensors Council, RIT-B 2024 – Present
Led RoboSoccer event with 4 custom-built bots using nRF modules. Designed "Breakpoint" circuit debugging challenge and "SensoryBot" robotics workshop.
Currently leading a drone project for thermal anomaly detection using infrared sensors and onboard sensor fusion.

Electrical Subsystem Member – Team Volante (EV Club) 2025 – Present
Worked on LV shutdown system and TSAL (Tractive System Active Light) circuits for EV go-kart. Designed power-safe distribution, emergency interlocks, and sensor supply for race-ready compliance.

Research

PID vs PPO for Real-Time Self-Balancing Robots
Under Dr. Shivprakash G, HOD, RIT-B (Ongoing)
Developing hybrid control system combining PID and PPO reinforcement learning. Real-time training on physical robot using MPU6050 + BTS7960 + Raspberry Pi + Arduino. Preparing for journal publication.

Awards

- Best Hardware Project – Ignitex, BGSIT
- Best Technical Bot Design – RoboSoccer @ DSU x MIT Square