

KAMAL BURA

Embedded AI | Robotics | Real-Time Control | IoT | Wireless Communications

Hyderabad, India | Email: burakamal13@gmail.com | Phone: +91 9491862415

LinkedIn: linkedin.com/in/kamal-bura | GitHub: github.com/Kamalbura | Portfolio: kamal.burafamily.in

PROFESSIONAL SUMMARY

B.E. graduate in Computer Science and Engineering (AI & ML) with hands-on, competition-tested experience in embedded firmware, real-time motor control, wireless communication, and edge AI. Built and raced custom RC platforms at national-level mechatronics competitions, developed a voice-controlled robotic vehicle with LLM command parsing and safety-layered autonomy, designed a custom long-range ESP-NOW wireless link, conducted Wi-Fi UAV security research at IIIT Hyderabad, and built a multi-agent QA orchestration system at Saras Analytics.

EXPERIENCE

AI Data Engineer Intern | Saras Analytics

Jan 2026 - Aug 2026

Multi-Agent Data Quality Systems

- Built a multi-agent QA orchestration system for production data pipelines — agent skills defined as custom skill files for grounding, categorization, and RCA generation.
- Designed agent routing that escalates ETL/Airflow-specific gaps to a dedicated data-engineering agent; in testing ahead of production rollout.
- Validated correctness, consistency, and completeness of production datasets feeding reporting and ML pipelines.

Freelance IoT Developer

Sep 2025 - Dec 2025

Independent Client Projects

- Delivered IoT prototypes involving sensor integration, microcontroller programming, and real-time data processing.
- Built deployment discipline through client-facing debugging, calibration, and iteration cycles.

IoT Research Intern | IIIT Hyderabad

May 2025 - Aug 2025

Wi-Fi Based UAV Drone Security Systems

- Selected from 60+ applicants for a competitive research internship focused on Wi-Fi based UAV drone security systems.
- Worked on implementing cutting-edge security mechanisms for UAV drone communication over Wi-Fi networks.
- Contributed to secure embedded workflows where communication reliability, latency, and system constraints matter.

EMBEDDED AND ROBOTICS PROJECTS

Voice-Controlled Robotic Vehicle

Raspberry Pi + ESP32, Picovoice, Azure STT, Gemini, PWM Control, ZeroMQ, FFmpeg

- Built Raspberry Pi + ESP32 robotic vehicle with wake-word activation, Azure speech-to-text, LLM command parsing, and PWM motor control.
- Added ultrasonic obstacle-stop safety layer, ChaCha20-Poly1305 encrypted control link, ZeroMQ IPC, live FFmpeg video streaming, and LED/OLED status feedback.
- Integrated YOLOv9/ONNX object detection; spatial navigation to spoken objects is in active development.

ESP32 Flight Controller

ESP32, MPU6050 IMU, Kalman/Complementary Filtering, PID Stabilization

- Developed flight-stabilization firmware using MPU6050 IMU readings with hybrid Kalman/complementary filtering.
- Implemented PID stabilization loop and optimized embedded code for low-latency orientation estimation.

Competitive RC Vehicle Platforms

BTS7960 Drivers, 4x Geared DC Motors, Custom 3S LiPo Pack, FlySky, Servo Control

- Built differential-steering RC monster truck platform using BTS7960 drivers, four geared DC motors, and custom 3S LiPo power pack, driven by a custom ESP-NOW control link (below).
- Built and raced earlier high-torque FlySky/servo-based RC platforms at national-level mechatronics competitions.

Long-Range ESP-NOW RC Control Link (for Competition RC Vehicle)

Dual ESP32-S3, ESP-NOW, 3dBi Antennas, Low-Latency Wireless Control

- Designed and built the wireless control system for the competition RC vehicle: a dual ESP32-S3 transmitter-receiver pair over ESP-NOW with 3dBi antennas, replacing off-the-shelf RC radios with a custom low-latency link.
- Engineered pairing, packet reliability, and failsafe behavior so throttle/steering commands stayed responsive at extended range under race conditions.

GNSS/GSM Personal Safety Alert Device

NEO-6M GPS, TinyGPS++, SIM800L, OLED Display, Push-Button Trigger

- Built personal safety alert prototype with NEO-6M GPS, TinyGPS++ location parsing, SIM800L SMS alerting, and OLED status display.
- Implemented push-button emergency trigger flow for location-aware SMS alerts from an embedded device.

Self-Hosted Edge Infrastructure

Raspberry Pi 4 8GB, Docker, Pi-hole, Tailscale, Samba, Grafana, Prometheus, UPS

- Ran Pi-hole/Tailscale/NAS edge stack with 99% uptime across 4 months of continuous operation (Feb-Jun 2026).
- Stably overclocked Raspberry Pi to 2GHz, validated under 100% CPU load for 5 minutes while staying under 60°C.

TECHNICAL SKILLS

Microcontrollers & Boards: ESP32, ESP32-S3, Arduino, Raspberry Pi 4, STM32 (CubeIDE, HAL), MPU6050, NEO-6M, SIM800L

Protocols & Interfaces: UART, SPI, I2C, GPIO, ADC, PWM, MQTT, ESP-NOW

Real-Time & Firmware: PWM motor control, PID loops, sensor polling, interrupt-driven inputs, IMU filtering, failsafe logic

Wireless & RF: ESP-NOW, Wi-Fi, Bluetooth, Tailscale, DNS, MQTT, 3dBi antennas, low-latency control links

Power Systems: 3S LiPo packs, motor drivers, UPS backup, SSD/HDD storage reliability, thermal validation

Security: Wi-Fi UAV security, ChaCha20-Poly1305 encrypted control link, secure embedded workflows

Software & Tools: C/C++, Python, Linux, Docker, Git, GitHub, VS Code, Arduino IDE, STM32CubeIDE

EDUCATION AND ACHIEVEMENTS

Bachelor of Engineering - Computer Science and Engineering (AI & ML)

Graduated Jun 2026

Vasavi College of Engineering, Hyderabad | CGPA: 7.6

- GATE 2026 (Computer Science) - Qualified, AIR 46071, GATE Score 298.