

NAGIREDDY BADHRINATH REDDY

Embedded Engineer

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PROFESSIONAL SUMMARY

- Embedded Firmware Engineer with hands-on experience in firmware development using ESP32, ESP32-S3 and STM32 microcontrollers for IoT and embedded device applications.
- Experienced in Embedded C, ESP-IDF, FreeRTOS, driver development, interrupts, DMA, peripheral interfacing and embedded communication protocols.
- Worked on RFID systems using Wiegand protocol, USB HID keyboard interfacing, biometric sensor integration, RTC modules, dot matrix LCDs and parallel LCD interfaces.
- Strong experience in UART, SPI, I2C, BLE, Wi-Fi, MQTT, HTTP/HTTPS and TCP/IP-based embedded communication.
- Hands-on with hardware debugging using oscilloscopes, logic analyzers and serial debugging tools.

EDUCATION

- B.E. Electronics and Communication Engineering – GITAM University (2025)
Percentage: 65.02

TECHNICAL SKILLS

- **Programming:**C, Embedded C, C++, Python
- **Microcontrollers / Boards:**STM32, ESP32,ESP32-S3, Raspberry Pi Pico, Raspberry Pi 4/5, ARM Cortex-M3/M4, Arduino Uno
- **Protocols:**UART, SPI, I2C, BLE, Wi-Fi, HTTP, HTTPS, MQTT, LoRa,Wiegand,Tcp, USB HID
- **Operating Systems:**Linux, Embedded Linux, FreeRTOS, ESP-IDF
- **Embedded Concepts:**Data Structures, Linux Device Drivers, RTOS Concepts, DMA, Interrupts, GPIO, Timers, Peripheral Drivers, Memory Management,HID Interfacing, RFID Systems, RTC Interfacing, LCD Interfacing
- **Tools/IDEs:**STM32CubeIDE, PlatformIO, VS Code, Git, Arduino IDE, Logic Analyzer, Oscilloscope, Serial Debug Tools
- **AI/ML:**TensorFlow Lite, YOLO, DeepSORT, OpenCV

PROFESSIONAL EXPERIENCE

Embedded Firmware Engineer — Noris Solutions

Jan 2026 – Present

- Developed embedded firmware using ESP32, ESP32-S3 and STM32F407 microcontrollers for embedded device and access-control applications.
- Worked with ESP-IDF framework for ESP32-S3 firmware development and FreeRTOS-based task handling.
- Implemented USB HID keyboard interfacing using ESP32-S3 and STM32F407 platforms.
- Integrated RFID reader systems using Wiegand protocol for authentication and access-control applications.
- Worked on biometric sensor interfacing and embedded device communication using ESP32-based systems.
- Developed firmware for dot matrix LCDs and parallel LCD interfaces for embedded display applications.
- Integrated RTC modules for real-time event logging and device synchronization.
- Implemented UART, SPI and I2C-based peripheral communication and device interfacing.
- Performed hardware debugging and protocol validation using logic analyzers, serial monitors and oscilloscopes.
- Developed reusable firmware modules and optimized embedded communication reliability.

Embedded Engineer — EurthTechtronics

Jan 2025 – Jan 10, 2026

- Developed embedded firmware in C for STM32, ESP32 and Raspberry Pi platforms.
- Designed peripheral drivers (UART, SPI, I2C) with DMA, interrupts and low-level register configuration.

- Developed BLE–Wi-Fi IoT gateways with secure HTTPS and JSON data handling.
- Integrated LoRa communication with optimized retries, packet framing and communication stability improvements.
- Built on-device configuration dashboards using LittleFS for device settings and logs.
- Worked on Embedded Linux for GPIO/I2C/SPI interfacing and system-level debugging.
- Used FreeRTOS queues, semaphores and timers for RTOS-based embedded applications.
- Implemented watchdog timers, brown-out detection and system recovery mechanisms.
- Performed hardware bring-up using oscilloscopes, logic analyzers and serial debugging tools.
- Worked on Edge AI pipelines using TensorFlow Lite and YOLO on Raspberry Pi platforms.

ACADEMIC - PROJECTS

Smart Traffic Lights Control System (ESP32, LoRa, RFID)

- Designed emergency vehicle detection using RFID and LoRa communication.
- Implemented real-time signal switching logic with safe fallbacks.
- Developed a simple dashboard for live status and event logs.
- Optimized LoRa packet handling for long-range reliability.

Multi-Object Tracking System (Raspberry Pi, YOLO, DeepSORT)

- Built real-time detection + tracking pipeline on Raspberry Pi.
- Integrated TFLite models with DeepSORT for accurate tracking.
- Used multithreading for stable performance and low latency.
- Achieved smooth edge inference through model optimization.

CERTIFICATIONS

- Embedded Systems and Driver Development — Udemy
- IoT Development and Cloud Integrations — Coursera

SOFT SKILLS

Problem-solving • Teamwork • Adaptability • Communication

CORE COMPETENCIES

Embedded Firmware Development • ESP-IDF • ESP32 / ESP32-S3 • STM32 • FreeRTOS • Embedded Linux • Driver Development • RFID Systems • Wiegand Protocol • USB HID Interfacing • UART/SPI/I2C Communication • IoT Protocols • Hardware Debugging • Peripheral Interfacing • LoRa Communication • Real-Time Embedded Systems • RTC & LCD Interfacing • Edge AI

DECLARATION

I hereby declare that the above information is true to the best of my knowledge and belief.

Date:

Place: Hyderabad

Signature: Nagireddy Badhrinath reddy