HARISH RAJA

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CAREER OBJECTIVE

As a passionate Electronics and Communication Engineering graduate with hands-on experience in embedded firmware development, particularly in medical-grade devices, I aim to leverage my foundational skills and industry exposure to contribute meaningfully to innovative and high-impact projects. I am eager to expand my technical expertise, adapt to emerging technologies, and grow as a versatile engineer in a dynamic and challenging environment.

PROFESSIONAL EXPERIENCE

Junior Embedded Engineer | BIOSCAN Research Pvt. Ltd. | Ahmedabad, Gujarat |
May 2024 – Present |

- Worked on firmware development for medical devices, focusing on reliable and real-time embedded system design.
- Integrated BLE and Wi-Fi modules for device connectivity and cloud communication using MQTT on Amazon Web Services.
- Implemented a secure OTA firmware update mechanism over HTTPS using TLS, ensuring safe and verified firmware delivery.
- Migrated existing firmware to STM32 HAL, improving portability, code structure, and maintainability.
- Developed timing-critical control logic using RTOS timers for multi-channel laser driver systems, and optimized performance based on real-world usage feedback.

Embedded Engineer Intern | Total Plant Engineering and Design | Madurai, Tamil Nadu |
Jan – Mar 2024

- Developed Firmware for the Automated Buck Boost converter for charging Lead Acid Batteries with solar PV arrays.
- Programmed PWM generation logic for switching between buck and boost modes using MOSFETs.
- Interfaced firmware with hardware and debugged using DSO, multimeter, and simulation tools.

EDUCATION

Bachelor of Engineering in Electronics and Communication Engineering
PSNA College of Engineering and Technology
Year of Passing: 2024 | CGPA: 8.0

HSC | Cheran Matriculation Hr. Sec. School | 2020 | 78%
SSLC | Cheran Matriculation Hr. Sec. School | 2018 | 89%

SKILLS

- Programming Languages: C, C++, Python(basics)
- Microcontrollers: ARM Cortex-M (STM32), 8051, ESP32
- Embedded Systems: Bare-metal, Linker Scripts, Startup Code, Low-level Driver Development
- RTOS: FreeRTOS
- Communication Protocols: UART/USART, SPI, I2C, CAN, BLE, Wi-Fi, MQTT, HTTPS (TLS)
- Tools: GCC, GDB, Makefiles, OpenOCD
- Version Control: Git, GitHub

PROJECTS

Automated DC-DC Buck-Boost Converter

- Developed firmware for a solar PV-based DC-DC converter with dynamic voltage regulation (12V/24V/36V).
- Implemented PWM control with ADC-based feedback loop for closed-loop output voltage stabilization.
- Designed embedded control logic for MOSFET switching in buck and boost modes.

Vibration Logger Module

- Designed an embedded system using MCU and MPU6500 sensor for real-time vibration monitoring.
- Developed firmware for threshold-based event detection and data logging to microSD using FATFS.
- Integrated RTC-based timestamping for accurate event tracking in logged data.
- Built a low-power battery-operated system using lithium-ion supply.

Multiple-Channel Laser Switching Control System

- Developed an embedded switching control system to drive three laser loads using a single laser driver module.
- Implemented precise timing control using RTOS/OS timers to generate 100 µs accurate pulses at 500 ms intervals for synchronized laser operation.
- Designed firmware logic for sequential and controlled switching of multiple laser channels with deterministic timing behaviour.
- Ensured stable pulse generation through real-time scheduling and low-level timer configuration.

Command-Based BLE Communication & Data Management System

- Developed a command-driven BLE communication system for embedded device configuration, control, and real-time data transfer, including a structured command parser for operations such as configuration changes and status retrieval.
- Integrated FATFS-based SD card file system for data logging and implemented BLE-based file management features, including file listing, clearing, and deletion.