Balaji V

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Summary

Embedded Firmware Engineer with 5+ years of experience in firmware development, IoT systems, and test automation. Hands-on expertise with ARM Cortex-M, STM32, RA6E1, K24, and LPC4078 platforms. Skilled in Embedded C, Python, Rust, and FreeRTOS with a strong background in communication protocols (UART, SPI, I2C, MQTT). Adept at linker scripts, system debugging, and mentoring junior engineers. Passionate about building reliable embedded systems and integrating cloud solutions. Available for immediate joining.

Technical Skills

Languages: Embedded C, Python, Rust
Frameworks/RTOS: FreeRTOS, TouchGFX, pytest
MCUs: STM32, RA6E1, K24, LPC4078, ATTiny85, ESP32
Tools: Git, IAR EWARM, Azure DevOps, AWS IoT Core
Protocols: UART, I2C, SPI, MQTT
Areas: Embedded Firmware, IoT, Test Automation, Linker Scripts

Work Experience

Embedded Firmware Engineer @ Hubbell
Mar 2021 – Sep 2025

Engineer I – Embedded Firmware (Apr 2025 – Sep 2025)
• Mentored juniors on coding standards and optimization, boosting bug resolution by 30%.
• Integrated new firmware features into legacy devices, ensuring smooth deployments and improving customer satisfaction without hardware upgrades in field.
• Built LNA feature to handle dual radio signals via SKY65313-21 RF chips on a single antenna.

Engineer II – Embedded Firmware (Apr 2024 – Mar 2025)
• Migrated legacy NV tool to modern IDE, cutting dev time.
• Measured CPU load using DWT_CYCCNT, improving accuracy over timers.
• Developed Python tool to program units without licenses, saving cost/time.
• Tuned dual-band antenna noise band; validated in RF noise + climate chambers.

Associate Embedded Firmware Engineer I (Nov 2021 – Mar 2024)
• Built ADC, RTC, UART drivers for RA6E1/K24 MCUs.
• Generated unit tests catching 90% of bugs pre-release.
• Automated firmware tests with Python (Rearchitect Pytest framework), reducing manual effort by 80%.
• Improved test framework with failure bubble-up and error tracking.

• Documented code/process for cross-time zone teams.
• Presented project at Tech Summit; praised by CTO.
• Supported Git adoption and maintained hardware inventory.

Project Associate (Mar 2021 – Nov 2021)
• Built Python apps for DFW process, streamlining tests.
• Integrated PC-Lint, reducing errors and uncovering bugs.
• Consistently delivered clean PRs with minimal review comments.

Junior Embedded Engineer @ XREVOL

Dec 2019 – Feb 2021

• Developed cloud-based access control device with RFID, Mobile using LPC4078 and ESP32.
• Enhanced firmware for smart door lock systems with STM32 and Silicon Labs BGM13P/BGM111 modules.

Internship: Embedded Developer @ Greenvironment

May 2019 – Nov 2019

• Designed a real-time turbidity level monitoring system using TCS34725 sensor.

Projects
• Arcade Game Console (ATtiny85) – Low-resource retro game console.
• CubeUNO (Python) – Workflow automation tool; appreciated by Arduino co-founder.
• CDE Your IDE (Python) – Lightweight developer IDE.
• PyomoDoro & StonePaperPi (Python) – GUI-based Pomodoro timer and Human Hand vs Computer game.
• Chess Encryption (Python) – Encrypt files into Chess PGN format with decryption tool.
• Home Automation & Smart Mobile Charger (NodeMCU) – IoT-based home system and safe charging solution.
• Complete IoT Product & BMS for EV – Prototypes using NodeMCU, ThingSpeak & AWS IoT Core.
• RFID Music Player (Arduino UNO) – RFID-controlled music system.
• LCD Display & Register-Level Drivers – Bare-metal programming on Nucleo & Arduino UNO.
• CI/CD for C and Python Projects – GitHub Actions for build, test & code coverage analytics.
• Open Source Contributions – ArduinoFreeRTOS + bug discovery in Brave browser.
• Recognition – Code archived in GitHub Arctic Vault.
• GitHub Blog – Created and maintain free blog site.
• Community Support – Released firmware libraries for multiple dev boards like STM32, HiFive, Photon, 8086, 8085, nrf82840, RaspberryPi, NodeMCU and Arduino.

Education
B.E. Electronics and Communication Engineering
Rajalakshmi Institute of Technology (2015 – 2019)