KUMAR M

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PROFESSIONAL SUMMARY

Embedded Engineer with 6+ years of experience in microcontroller-based firmware development, real-time systems, and board bring-ups for Avionics, Defence, and Industrial Applications. Proficient in Embedded C, ARM Cortex, RTOS, and Embedded Linux. Strong debugging and hardware testing skills. Currently expanding expertise in Embedded Linux & MPU development to drive innovation in next-generation embedded systems.

KEY SKILLS

- Embedded Software Development: C, Embedded C

- Microcontrollers & MPUs: ARM Cortex-M, PIC, Atmel AVR

- Embedded Linux: Bootloader, Device Tree, Kernel Modules

- Protocols & Peripherals: UART, SPI, I2C, Ethernet

- Debugging & Testing: Oscilloscope, Logic Analyzers

- Version Control: Git

- Tools & IDEs: GCC, VS Code

- Project Documentation & Collaboration: Jira, Confluence, GitHub

EXPERIENCE

SENIOR ENGINEER I (SDE2) | MICROCHIP TECHNOLOGY | MAY2024 - PRESENT

- Verified New Part / New Silicon before public release, ensuring hardware and software validation for embedded systems.

- Developed a framework to test and validate MPLAB VS Code extensions for 8/16/32-bit devices against compatible compilers.

FUNCTION DEVELOPER | BOSCH (BMW CUSTOMER ENGINEERING TEAM) | 1 YEAR, 8 MONTHS

- Developed and optimized control logic for Thermal Devices Package (BMW S68T0 engine), improving cold start efficiency by integrating PI loops and refined entry/exit logics. Leveraged ASCET tool for function development, with critical components implemented manually for enhanced performance.

- Ensured Functional Safety compliance with ISO 26262 by verifying Unit Tests (UT) and System Functionality Tests (SFT) at BC level / PVER level using TPT tool, focusing on validating system stability and error handling to mitigate potential safety risks.

- **VOLVO TEAM – EMBEDDED SYSTEMS ENGINEER**
  - Integrated a 2K camera module with MIPI CSI for high-speed data transfer.

  - Configured camera interface components for optimised data flow.

- Delivered Proof-of-Concept validation after project discontinued due to budget restrictions.

EMBEDDED SYSTEMS ENGINEER | DATA PATTERNS | 3 YEARS, 9 MONTHS
- Designed and developed firmware for defense & avionics applications.

- Key Projects: LCD Backlight System for LCA Tejas, UHF Communication for Sonobuoy, VHF/UHF Telecommand / Telemetry for ISRO INS2-TD Ground Station / OnBoard Computer, Reaction Wheel, GPS module.

- Led board bring-ups and microcontroller firmware development.

- Collaborated with RF & Hardware teams for system integration.

EDUCATION
Bachelor of Engineering (Electronics & Communication Engineering) | Anna University | 2018

ACHIEVEMENTS & INNOVATIONS
- Received accolades from URSC LEO department directors for contributions to ISRO INS2-TD Ground Station & OnBoard Computer firmware development.

- Winner of Department-Level Hackathon at Bosch for developing scripts to analyse ELF and HEX files using map files, improving code size and memory efficiency by optimising compiler flags in compliance with automotive safety standards.

- Advocated for Rust support in Microchip's development tools, proposing XC compiler integration to explore compatibility with ARM Cortex-M architectures.

- Proposed a WiFi-based flashing and debugging tool as an alternative to PicKit 5, enabling wireless code flashing and real-time log streaming over WiFi, similar to PuTTY for serial debugging.

CERTIFICATIONS & TRAINING
- Advanced C Programming for Embedded Systems (Completed, Vector Institute)

PROJECTS & CONTRIBUTIONS
- Due to the nature of past work in defense, automotive, and semiconductor industries, project details are protected under NDA agreements.

- Hands-on experience in Embedded Linux, RTOS, and board bring-ups with real-world applications in avionics, automotive, and industrial domains.

- Strong contributor to internal R&D improvements, providing insights on compiler optimizations, functional safety compliance, and next-gen embedded tool development.

ADDITIONAL INFORMATION
- Availability to Relocate: Open to relocation opportunities in Europe and globally.
- Languages: English, Tamil
- Interests: Open-source Embedded Projects, Low-level Firmware, Linux Kernel Programming