PRIYESH MAHAJAN

Embedded Software Engineer

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SUMMARY

Results-driven Embedded Systems Engineer with 2.9 years of hands-on experience in embedded firmware development, PCB design, hardware-software integration, and end-to-end system validation for automotive and industrial applications. Proficient in Embedded C/C++, RTOS, TI C2000 and STM32 microcontroller platforms, BLDC motor control algorithms, PWM control, and full product development lifecycle from schematic capture to production release. Demonstrated expertise in board bring-up, EMI/EMC compliance testing (CE, RoHS, REACH), root cause analysis, and delivering robust, production-ready embedded solutions. Strong track record of cross-functional collaboration to improve system reliability, reduce development cycles, and meet stringent industry standards.

TECHNICAL SKILLS

- **Embedded & Firmware:** Embedded C, C++, Bare-Metal Programming, RTOS, Interrupts, Drivers, I2C, UART, SPI
- **Microcontroller & Platforms:** TI C2000 (F280049C), ARM Cortex-M, Motor Control SDK
- **Hardware Design:** PCB Design, Schematic Design, Component Selection, Signal Integrity, Power Electronics
- **Debugging & Validation:** Board Bring-Up, Oscilloscope, Logic Analyzer, DMM, Root Cause Analysis
- **Motor Control & Power Systems:** BLDC Motor Control, Trapezoidal Commutation, PWM Control, Fault Handling
- **Compliance & Testing:** EMI/EMC Testing, CE, RoHS, REACH Standards
- **Tools:** KiCad, Altium Designer, LTSpice, Code Composer Studio (CCS), VS Code, Git

PROFESSIONAL EXPERIENCE

L&T Technology Services | Pune, India **Sep 2023 – Present**

- Designed and validated PCB schematics and layouts using KiCad and Altium Designer, performing component selection, signal integrity analysis, and power distribution network validation to meet strict power and signal requirements.
- Led comprehensive board bring-up, low-level firmware debugging, and hardware-software integration for multiple microcontroller-based embedded systems, utilizing oscilloscopes, logic analyzers, and DMMs for root cause analysis and rapid issue resolution.
- Developed and integrated real-time embedded firmware in Embedded C/C++ for BLDC motor control applications on TI C2000 platform, implementing trapezoidal commutation, PWM control loops, fault detection, protection mechanisms, and performance optimization.
- Collaborated closely with cross-functional teams (firmware, hardware validation, mechanical, and systems engineering) in an Agile environment to deliver complete embedded products from concept through production release, aligned with automotive-grade and industrial quality standards.
- Created and maintained detailed technical documentation including design specifications, test plans, validation reports, EMI/EMC test results, and design review presentations to ensure traceability and compliance with internal and customer requirements.

PROJECTS

BLDC Motor Controller (TI C2000 Platform)

Tools: MotorControl SDK, CCS, KiCad, VS Code

- Architected and developed production-grade BLDC motor control firmware on TI F280049C (C2000) microcontroller, achieving stable real-time performance and improved motor efficiency through optimized control algorithms.
- Implemented six-step trapezoidal commutation, PWM module configuration, interrupt-driven control loops, fault detection/protection mechanisms, and robust error handling for reliable motor operation in industrial environments.
- Conducted extensive hardware-in-the-loop testing, performance tuning, and validation to ensure compliance with timing, efficiency, and safety requirements.

NEXUS Automation – Stanley Black & Decker (STM32 Platform)

Tools: STM32G4 MCU, J-Link SEGGER, Saleae Logic Analyzer, DAC Board, Hall Simulator Board

- Designed and developed a versatile embedded validation platform on STM32G4 microcontroller to support real-time control algorithm testing and hardware-in-the-loop simulation for motor control applications.
- Engineered custom DAC interface board and Hall sensor simulator hardware to accurately replicate analog sensor signals and real-world operating conditions, enabling comprehensive firmware validation without physical motors.
- Executed advanced debugging and validation workflows including firmware flashing, trace analysis with J-Link SEGGER, and high-resolution protocol/timing analysis (SPI, UART, GPIO) using Saleae Logic Analyzer to verify communication integrity and timing compliance.

Asset Tracking & Tagging System

- Designed low-power embedded hardware architecture with optimized power management circuitry and robust I/O interfacing for reliable long-term asset tracking and monitoring applications.
- Applied best-practice PCB layout techniques for EMI/EMC compliance (signal integrity, grounding, shielding) and successfully validated the complete system through functional, environmental, and compliance testing.

EDUCATION

B.Tech – Electronics & Telecommunications Engineering | Bharati Vidyapeeth Deemed University, Pune **2019 – 2023**

CGPA: 8.4

HSC | Macro Vision Academy, Burhanpur

Percentage: 66%

SSC | Macro Vision Academy, Burhanpur

CGPA: 9.6