

# ABHISHEK CHAWDA

## EMBEDDED FIRMWARE ENGINEER

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### SUMMARY

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Embedded Firmware Engineer with 1.9 years of experience in Bare Metal firmware development on ARM Cortex-M platforms, with strong expertise in register-level programming, memory-mapped I/O, and interrupt-driven system design. Hands-on experience in developing real-time embedded systems, peripheral interfacing, and hardware-software integration.

### CORE TECHNICAL SKILLS

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Programming: C, Embedded C

Microcontrollers: ARM Cortex-M4

Bare Metal Development: Register-Level Programming, Memory-Mapped I/O

Interrupt Systems: NVIC, SysTick, Interrupt Handling

Peripherals: SPI, I2C, UART, GPIO, ADC, PWM, Timers

Core Concepts: Real-Time Systems, Memory Management

Debugging Tools: GDB, OpenOCD, Logic Analyzer, Oscilloscope, Embedded Debugging

Tools: GCC, Makefile, Git

### PROFESSIONAL EXPERIENCE

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Embedded Firmware Engineer

Indian Air Force – Defence Communication Systems

Jun 25 - Dec 25

Deployed via ABM Knowledgeware & Akal Information Systems

- Worked on firmware for real-time embedded communication systems on ARM-based platforms.
- Assisted in interfacing RF modules using SPI, I2C, and UART for data communication.
- Contributed to implementation of low-latency data handling mechanisms for time-critical systems.
- Participated in debugging timing issues and race conditions affecting system behavior.
- Involved in hardware-software integration and system-level validation activities.
- Contributed to development and testing of high-reliability defence communication systems.
- Participated in integration and testing of communication modules across different hardware setups.
- Supported real-time communication system performance through continuous testing and monitoring.

Embedded Software Engineer

Mar 24 – Apr 25

Meliorates Technologies Pvt. Ltd.

- Worked on Bare Metal firmware development on STM32 (ARM Cortex-M4) using Embedded C for real-time applications.
- Assisted in developing register-level peripheral drivers for SPI, I2C, UART, ADC, PWM, Timers, and GPIO.
- Participated in board bring-up activities, pin configuration, and hardware validation.
- Assisted in optimizing ISR execution time to reduce timing jitter in real-time systems.

- Assisted in understanding microcontroller datasheets and reference manuals for peripheral configuration.
- Contributed to implementation of interrupt-driven firmware using NVIC for real-time behavior.

## PROJECTS

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### Low-Latency Communication Firmware (Bare Metal)

- Designed real-time data processing firmware for RF communication using interrupt-driven architecture.
- Developed SPI-based high-speed data acquisition using register-level programming.
- Implemented deterministic execution using interrupt prioritization and efficient buffering.
- Achieved <5 ms latency through optimized data handling and ISR tuning.

### Smart Motor Controller (Bare Metal STM32)

- Implemented PWM-based motor speed control and assisted in integrating ADC feedback for closed-loop control.
- Participated in development of control logic for PWM duty cycle adjustment.
- Supported debugging of timing issues using oscilloscope and logic analyzer.
- Contributed to testing and validation under different load conditions.
- Participated in hardware-software integration and peripheral verification.
- Contributed to improving system reliability through testing and debugging.
- Observed improved motor response stability after tuning control parameters.

## CERTIFICATIONS

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AEmbedded Systems Program – Emertxe Information Technologies

Jul 23 - Feb 24

Modules: C, C++, Data Structures, Operating Systems (Linux), Microcontroller Programming, Linux Internals

## EDUCATION

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Bachelor of Engineering – Electronics and Communication Engineering

Aug 19 - Jun 23

G H Patel College of Engineering and Technology, Gujarat

CGPA: 9.00