

Bharati Babu Bhosale | Associate Firmware Engineer

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CAREER OBJECTIVE

A passionate and experienced Firmware Engineer with nearly 2 years at Emerson, specializing in Embedded C programming and microcontroller systems like STM32 and NetX90. Skilled in firmware development, debugging, and integrating communication protocols such as CAN, SPI, UART, and I2C. Adept at fault detection and diagnostics, Bluetooth communication, and user interface development using TFT LCD displays. Seeking an Embedded Engineer role to leverage my expertise in developing innovative and high-performance technology solutions.

PROFESSIONAL EXPERIENCE

Associate Firmware Engineer

Emerson Innovation Center | November 2023 - June 2024

- Specialized in Embedded C programming and microcontroller systems, particularly with STM32 and NetX90.
- Developed firmware for projects like the G3 Profinet fieldbus system and a test automation project, utilizing communication protocols:
 - SPI, UART and GPIO as external interrupts for enhanced system reliability.
- Focused on fault detection, diagnostics, and system validation, ensuring optimized embedded software integration.
- Proficient in tools like:
 - STM32CubeIDE, NetX Studio CDT, and Visual Studio, ensuring efficient and high-quality firmware development.
- Strong problem-solving skills with hands-on experience in debugging and system optimization.

Graduate Trainee Engineer

Emerson Innovation Center | November 2022 - October 2023

- Contributed to a Bluetooth-enabled pressure regulator project, where I:
 - Developed and tested firmware for real-time data transmission using UART communication.
 - Created a Bluetooth application with real-time LED indicators for pressure monitoring, improving user interaction and system efficiency.
- Self-trained in embedded software development, microcontroller programming, and real-time operating systems (RTOS).
- Developed example codes using FreeRTOS, implementing:
 - Mutex, semaphores, and task scheduling to understand multitasking in embedded systems.
- Gained hands-on experience with communication protocols, writing example codes for:
 - UART, SPI, I2C, CAN, ADC, Timer, PWM, and GPIO.
- Worked with interrupts and debugging tools, including:
 - Oscilloscope and multimeter for real-time signal analysis and troubleshooting.
- Gained experience in UART serial terminals and the PCAN View tool for CAN communication analysis, enabling efficient debugging and validation of embedded systems.

PROJECTS

G3 Profinet (TFT Display)

- Developed and implemented firmware for Graphic Display to showcase real-time status and diagnostics of the G3 Profinet fieldbus system.
 - Conducted system-level testing, identifying and resolving key issues, contributing to product stability and reduced system downtime by 15%.
 - Technologies Used: NetX90 (Hilscher's Controller), SPI, CAN, GPIO, Timers
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Test Automation (Fault Detection)

- Developed and integrated fault detection firmware on STM32F407VG interfaced with a pressure regulator board. Enhanced system reliability through automated fault diagnostics, improving fault tolerance by 20%.
- Utilized external interrupts for GPIO and performed diagnostics of multiple system faults, reducing manual testing time by 30%.
- Technologies Used: STM32F407VG Board, Pressure Regulator Board, GPIO, Interrupts

Pressure Regulator Bluetooth(HC-05) Project

- Developed firmware to interface HC05 Bluetooth module with STM32F407VG, enabling UART-based transmission of pressure values and reception of setpoints.
- Created a dynamic Bluetooth Terminal Application that visualized real-time pressure values via LED indicators, improving usability and real-time monitoring accuracy.
- Technologies Used: STM32F407VG, UART, Bluetooth (HC05)

TECHNICAL SKILLS

- **Programming Languages:** Embedded C, C++, Python
- **Microcontrollers:** STM32F407VG, NetX90, ESP32
- **Communication Protocols:** CAN, SPI, UART, I2C, RS232, ADC, Timers
- **Experience on** Bluetooth module (HC-05), TFT LCD Display
- **Knowledge** about LoRa module
- **Development Tools:** STM32CubeIDE, STM32CubeMX, NetX Studio CDT, Visual Studio, MPLAB
- **Other Tools:** Oscilloscope, Multimeter, GitLab, GitHub, IBM Jazz
- **Additional Knowledge:** Embedded Linux, RTOS (FreeRTOS), Data Structures, Schematics, and Datasheets

SOFT SKILLS

- Effective Communication
- Problem Solving
- Active Listening
- Time Management
- Team Collaboration

EDUCATION

Post Graduate Diploma in Embedded System Design

- Minor in Embedded C, Microcontroller, Protocols, C++, Python, OS, RTOS, FreeRTOS, Linux, IOT, Data Structures
- Centre for Development of Advanced Computing (C-DAC) • Pune • 2022 • 63.57%

Bachelor of Engineering in Electronics & Telecommunication

- Pravara Rural Education Society, Sir Visvesvaraya Institute of Technology • Nashik • 2020 • 6.92 CGPA

CERTIFICATION

Certification of C++ Programming

- Modern C++ Object-Oriented Programming (OOP) and STL
- Udemy | January 2025

Certification of Python Programming

- Pursuing
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