

Nayana Wagh

Embedded Software Engineer

8, Maratha Mandir, Sanghvi, Pune 
7972303245 
Wagnayana15@gmail.com 

Result-oriented Embedded Software Engineer with hands-on experience in microcontrollers (8051, AVR, STM32, Qorvo), communication protocols (SPI, I2C, UART, MODBUS), and real-time embedded systems. Skilled in designing and implementing efficient embedded solutions with FreeRTOS, hardware-software integration, and system optimization. Proficient in debugging and validation using logic analyzers and oscilloscopes for reliable system performance. Delivered energy-efficient and robust solutions for industrial and IoT applications. Seeking challenging opportunities to contribute to innovative projects and enhance technical expertise."

Skills

- Programming languages: C, Embedded C, C++ (object-oriented programming for embedded systems)
- Microcontrollers: 8051, AVR, ARDUINO, PIC. (16, 32bit), QORVO, STM32.
- Tools and IDE: Keil uVision 4 & 5, MPLAB IDE v8.89, Proteus v8
- Hardware Interfacing: Keypad, Seven Segment Display, LCD Display, Sensors (IR, DHT22, ADXL-335)
- Protocols: UART, I2C, SPI, MODBUS,

Experience

December 2024 – Present

Embedded Software Engineer/ Replus Engitech Private Ltd, Pune

Project: V64 – Energy Storage & Battery Management System

Key Responsibilities:

- Implemented and tested SPI communication between microcontroller and peripheral devices.
- Verified data transmission and synchronization through SPI protocol using **Saleae Logic Analyzer** for waveform capture and protocol decoding.
- **Integrated IO Expander (PCA9671) using I2C protocol** for controlling multiple peripheral modules.
- Developed modular C++ classes for LED control, button inputs, and I2C sensor interfacing, enhancing code reusability and maintainability.
- Assisted in debugging and hardware-software interfacing for embedded system modules.
- Designed and implemented SPI/SSP communication drivers in Embedded C for Qorvo PAC microcontroller.
- Developed initialization routines for SSP modules, including clock, frame format, endian, phase, and polarity configuration.
- Implemented interrupt-based data handling for SSP transmit and receive operations.
- Optimized data transfer timing to achieve stable SPI communication up to 2 MHz
- Ensured compatibility for both **Master and Slave modes**, enabling communication with external sensors and devices.

MARCH 2022 – JUNE 2023

Embedded Software Engineer / Onward Technologies, Pune

Project: Raytech Vision Embedded Sensor & Communication Module

Key Responsibilities:

- Worked on **SPI and I2C communication** between microcontroller and peripheral sensors.
- Interfaced environmental sensors (e.g., temperature, humidity) with microcontroller.
- Managed **UART communication** for data transfer between microcontrollers.
- Assisted in **hardware-software integration and debugging** using logic analyzers.
- Developed **Embedded C drivers** for sensors and communication protocols.
- Conducted **testing and validation** of sensor data acquisition and communication reliability.

APRIL 2019 – JUNE 2021

Embedded Engineer / Intent Technologies, Pune

Project 1: Digital Voltmeter using AVR Microcontroller

Key Responsibilities:

- Designed and implemented a **12V** digital voltmeter using **ATMEGA32A (16-bit)** microcontroller.
- Utilized **10-bit ADC** for accurate voltage measurement.
- Developed firmware in Embedded C for real-time voltage acquisition and display.

Project 2: Automatic Street Light control using Arduino

Key Responsibilities:

- Developed an energy-efficient automatic street lighting system using Arduino and TCRT5000 IR sensors.
- Programmed system to adjust light intensity based on vehicle presence, reducing energy wastage.
- Implemented sensor-based control logic for automated ON/OFF operations.
- Assisted in hardware-software integration and testing of embedded modules

Project 3: Temperature & Humidity Monitoring System (STM32)

Key Responsibilities:

- Developed an environmental monitoring system using STM32 MCU and DHT22 sensor.
- Implemented sensor interfacing and real-time data acquisition using Embedded C.
- Configured I2C communication to display temperature and humidity on a 16x2 LCD.
- Programmed timing-sensitive routines for precise DHT22 sensor reading.
- Assisted in hardware-software integration, testing, and debugging of embedded modules.
- Ensured reliable and accurate environmental monitoring for long-term operation.

BE Final Year Project: Smart Wheelchair

Technologies: Arduino Microcontroller, ADXL-335 Sensor, GPS Modem, GSM Modem, Bluetooth, Motor Driver Circuit

Project Description:

- Developed a **multi-control smart wheelchair** for people with mobility challenges.
- Integrated features including **voice control, obstacle detection, manual switching, and GPS/GSM-based location tracking**.
- Implemented **sensor interfacing** with ADXL-335 for motion detection and **Bluetooth module** for remote control.
- Designed **motor control circuits** for reliable and safe movement.

Diploma Final Year Project: RFID-Based Billing Trolley

Technologies: RFID Reader, RFID Tags

Project Description:

- Developed an **RFID-based billing system** for retail trolleys.
 - Integrated **RFID readers** in trolleys and attached **RFID tags** to products for automated billing.
 - Reduced manual checkout time and enhanced **inventory management efficiency**.
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Education

2015-2018

BE in Electronics & Telecommunication

North Maharashtra University,

Percentage: 78%

2012-2015

Diploma in Industrial Electronics

MSBTE

Percentage: 77.83%

SSC

Maharashtra Board

Percentage: 70.00%

Diploma in Embedded System

Bicard, Pune

Course Duration - 6 Months

I hereby declare that the above written particulars are true and correct to the best of my knowledge and belief.

Name: Nayana Wagh