

RAJVARDHAN ARI

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PROFESSIONAL SUMMARY

Experienced Firmware Engineer with **2 years of experience** in **microcontroller and microprocessor development**, communication protocols, cross-compilation, and **machine learning integration into embedded systems**. Skilled in **embedded design, sensor interfacing, new product development, and debugging** to optimize system performance. Seeking a dynamic role to apply my **software engineering expertise** and gain **hands-on industry experience** in **IoT, industrial automation, and real-time systems**.

WORK EXPERIENCE

Firmware Engineer

27th Mar 2023- present

Kemsys Technologies Private Limited

Domlur, Bangalore

- Developed a motion activity classification system using machine learning with the **IIS3DWBTR** accelerometer and **TinyML** on the **STM32WB55**.
- Implemented **ADXL345** accelerometer data collection over **I2C** and integrated **GPS** data.
- Enabled **FOTA** on **GatewayAgent** with version synchronization between the **cloud** and **local storage**.
- Utilized **Flash ROM** on the **EC200U-CN** for **cloud configuration storage** and **RS485** data transmission.
- Integrated **Modbus RTU** with the **EC200U-CN** for **RS485 communication** and **Azure IoT Hub** connectivity.
- Developed automatic device provisioning using **Azure DPS** with **TOTP-based** secure cloud registration.
- Cross-compiled the **Azure IoT C SDK**, **Mosquitto**, **Modbus**, **muparser**, **OpenSSL**, and **curl** for **multi-architecture support**.
- Built a custom **DFU** application for the **nRF52840** with **OTA updates** via **BLE** and **UART** firmware transfer.
- Implemented **Bluetooth** with **auto-reconnection**, **single-device pairing**, **sleep mode** during charging, **auto-off** on charger removal, and **call-based Bluetooth disablement**.
- Implemented **Ethernet**, **TCP/IP**, and **HTTP** protocols on the **STM32** for **network communication** and **data exchange**.
- Developed an **STM32-based** system with **ultrasonic** and **ACS172** sensors, an **OLED display**, **W25Qxx flash storage**, and **BLE** data transmission to a **smartphone**.
- Proficient in communication protocols, including **I2C**, **SPI**, **UART**, and **BLE**, with hands-on experience integrating sensors, storing data, and enabling wireless transmission.
- Tested **IoT gateways** for **cloud connectivity**, **sensor integrations**, **LTE**, **FOTA**, **caching**, **FFT**, and **system monitoring**.

EDUCATION

Maharaja Institute of Technology Thandavapura, Mysore

Bangalore, India

- Bachelor of Engineering in Electronics and Communication with CGPA of 7.57

May 2022

Government polytechnic, Gajendragada

Gadag, India

- Diploma in Electronics and Communication with percentage of 70

Aug 2018

SKILLS AND EXPERTISE

Programming Languages: C, C++, Shell scripting

Operating Systems: Windows, Linux

Microcontrollers: STM32WB55, EC200UCN_AA, ESP32, STM32F413ZH, Raspberry Pi Pico, STM32F207ZG

Embedded Systems Skill: ADC, Interfacing with 16x2 Character OLED, GPIOs, Sensors, Interrupts, Bootloader, FreeRTOS, Cross-compilation

Communication Protocols: UART, I2C, SPI, TCP/IP, Modbus RTU, MQTT, Modbus TCP, USB

Version Control Tools: Git, Bitbucket

Development Environments: Visual Studio Code, STM32CubeIDE, CodeLite.

Software Tools: PuTTY, WinSCP, Docklight, FileZilla, NRF Connect, STM32Cube Programmer, TCP Viewer, QCOM V1.6, Q_Flash.

SOFT SKILLS

- Team Management
- Mentorship and Support for Team Members
- Effective Communication
- Problem-Solving
- Adaptability
- Collaboration
- Leadership

INTERNSHIP AND TRAINING

QSpiders

- Trained in Java, SQL, Manual Testing, Selenium, and Software Development Life Cycle (March - May 2022).

HOBBIES

- Travel
- Cooking
- Gaming