SIVARAJ RAMESHKANNAN

EMBEDDED SOFTWARE ENGINEER

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SUMMARY

Embedded Software Engineer with 2+ years of R&D experience developing scalable, standards-compliant firmware and applications across medical, consumer, and industrial domains. Experienced in designing maintainable and extensible firmware architectures using modular and layered architectural practices to support long-term scalability. Adept at designing RTOS-based embedded systems, specialized in optimizing UI performance, and integrating connectivity protocols such as MQTT, Modbus, and TCP/IP.

EXPERIENCE

EMBEDDED DESIGN ENGINEER, RESEARCH AND DEVOLOPMENT,
TRONICZONE PVT LTD, BANGALORE, KARNATAKA | OCT 2024 – PRESENT

Key Projects:

- **Multimeter for Compressed Air:**
  - **ESP32 (ESP-IDF) firmware development** using FreeRTOS and LwIP (TCP/IP socket communication over Wi-Fi).
  - **Peripheral integration:** SPI (LCD), I2C & ADC (pressure sensor), custom driver development.
  - **Embedded GUI using LVGL** and Android app communication aligned with business logic.

- **Semi-Auto Chemistry Analyzer:**
  - Developed **calibration algorithms** for spectrophotometric measurement system.
  - Implemented **stepper motor control logic** for precise sample positioning.
  - Designed and integrated touchscreen UI using **STemWin**.

- **Electrolyte Analyzer:**
  - Enhanced embedded UI performance using **Legato Graphics**.
  - Integrated and optimized display pipeline with **Harmony drivers**.
  - Implemented error detection mechanism with configurable threshold limits.
- **Additional Contributions:** Supported development and troubleshooting for vibration analyzer and cryogenic temperature controller systems.

EMBEDDED ENGINEER, RESEARCH AND DEVOLOPMENT,
FARADAY OZONE PVT LTD, COIMBATORE, TAMILNADU | MAY 2023 – JUNE 2024

Key Projects:

- **High Frequency Power Supply:**
  - Worked on adding additional features for advanced version of the firmware.

- Integrated and implemented the application layer for MODBUS communication protocol for communicating with PLC with RS232 on ATSAMC microcontroller.

- **Smart Toilet System (IOT - Based):**
  - Developed dynamic ROI algorithms for ToF sensor-based detection on ESP32.
  - Integrated MQTT for remote access and monitoring.
  - Contributed to Oduor monitoring module testing.

- **Napkin Incinerator (Consumer Electronics):** Developed firmware for multiple product variants (600W–1400W) and optimized thermal control logic.

- **Poultry Ozone Skid System (IOT - Based):** Designed ESP-based IoT gateway module with live GPS tracking, internet connectivity, and remote monitoring and control features.

KEY TECHNICAL SKILLS

PROGRAMMING LANGUAGES: C (Expert), C++ (Expert), Python (Intermediate)

PLATFORMS: SW4STM32, Keil, MPLAB X IDE, Microchip Studio, ESP-IDF, Platform IO, VS Code

MIDDLEWARES: HAL, ASF (Advanced Software Framework), STemWin, LVGL, Legato and Harmonics

MICROCONTROLLERS: STM32 H & F series, ATSAM C Series, ATMEL, ESP32, RL78

SOC USED: Zynq 7000 (FPGA CUM SOC)

RTOS USED: FreeRTOS, Zephyr

PROTOCOLS WORKED: UART, SPI, I2C, CAN, RS232, MODBUS, TCP/IP, MQTT, HTTP, WIFI

TOOLS: GIT, Makefile, CMAKE

O**S KNOWN:** Linux, Windows

EDUCATIONAL DETAILS

B.E Mechatronics Engineering | Kamaraj College of Engineering and Technology

Sep 2018 – May 2022 | CGPA 7.92

LANGUAGES KNOWN

TAMIL (NATIVE) | ENGLISH (PROFESSIONAL) | HINDI (BEGINNER) | KANNADA (BEGINNER)
