

## Soundarya SA

Bengaluru, India

Email: soundaryaadaragi@gmail.com | Phone: +91 6364632416

LinkedIn: [linkedin.com/in/soundarya-adaragi-4917a11a5](https://www.linkedin.com/in/soundarya-adaragi-4917a11a5)

---

## Career Objective

Passionate and detail-oriented Embedded Software Developer with hands-on experience in firmware development, microcontroller programming, and peripheral interfacing. Eager to contribute to innovative embedded systems and deepen expertise in embedded C/C++, real-time operating systems, and industrial communication protocols.

---

## Technical Skills

**Languages:** C, C++

**Microcontrollers:** Renesas RA Family, STM32, Arduino UNO

**Protocols:** UART, I2C, MODBUS (RTU)

**Tools/IDEs:** e<sup>2</sup> studio, Renesas FSP, Tera Term, RealTerm

**Displays:** DWIN DGUS, 20x4 LCD, 7-Segment Display

**Peripherals:** ADC, RTC, Relays, Buzzer, GPS Module, Switch buttons, USB.

**Sensors:** Temperature sensor, Water Sensors, Gas Sensors

**Version Control:** Git

**Debugging:** Serial Monitor, Breakpoints, LED Indicators

---

## Internship Experience

### Embedded Software Developer

RabBan Control Solutions | June 2024 – May 2025

### Project 1: Multichannel Gas Monitoring System

- Developed embedded firmware using C/C++ for Renesas RA series microcontroller in an industrial gas detection setup.
- Interfaced multiple ADC channels with gas sensors to measure varying gas concentrations with real-time accuracy.
- Implemented fault-handling, alarm, and warning mechanisms using relays, buzzers, and 7-segment displays.
- Designed calibration logic to dynamically set and store gas level thresholds for different sensor types.
- Used the RTC module to log time-stamped data for monitoring gas trends over time. Integrated Modbus communication to share gas data and alerts with external industrial monitoring sensor data. alarm states, and provide user navigation for calibration and configuration menus.
- Configured and programmed DWIN DGUS HMI to visualize sensor data, alarm states, and provide user navigation for calibration.

## **Project 2: Application-Specific Processor(ASP).**

- Implemented multi-tasking architecture using FreeRTOS to handle sensor monitoring, relay control, buzzer management, and UI updates concurrently.
  - Acquired temperature sensor readings and evaluated them against configurable threshold levels.
  - Controlled relays based on sensor input, activating fans or equipment as per defined thresholds.
  - Enabled user-configurable scheduling of relays using an internal RTC, allowing automation of fan control
  - Ensured reliable communication between the microcontroller and the HMI via Modbus protocol.
  - Integrated buzzer alert system that activates during critical temperature events and supports manual mute control via HMI.
- 

## **Academic Project**

### **Smart Blind Stick using Arduino UNO**

- Built an Arduino-based smart blind stick for help blind people.
  - Programmed it to find obstacles and depths using Ultrasonic sensor.
  - Designed the mechanical and control system to automate buzzing and vibration operations when obstacle detects.
  - Project aimed at affordable for poor blinds.
- 

## **Projects and Highlights**

- Developed modular, scalable embedded codebases following best practices.
  - Debugged real-time systems to ensure accurate timing and signal reliability.
  - Hands-on experience in embedded hardware-software integration.
  - Worked with cross-functional teams to resolve firmware issues.
- 

## **Education**

### **Bachelor of Engineering – Electronics and Communication**

Angadi Institute of Technology and Management , Belagavi

Graduation Year: 2023 | CGPA: 8.09 / 10

---

## **Core Competencies**

- Embedded C/C++ Development
- Real-Time Data Acquisition and Logging
- Sensor Interfacing and Calibration Logic
- HMI Design and Development
- Industrial Communication: MODBUS (RTU), UART, I2C
- FreeRTOS (Basic Exposure)
- Embedded Debugging and Peripheral Management
- Debouncing and Hysteresis logic.