

Purna Ramyasree Saniseti

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Location: Hyderabad

Professional Summary

Embedded Firmware Engineer with over 2+ years of experience in real-time systems, low-level firmware, and Qt-based applications (Python). Skilled in STM32, MSP430, Arduino, and Raspberry Pi with expertise in FreeRTOS, multithreading, and UI design. Proficient in low level driver development, sensor integration, PCB bring-up, and debugging with JTAG, oscilloscopes, and logic analyzers.

Technical Skills

- Programming Languages: Embedded C, Python, C
- Embedded Development: Bootloader, Low level driver development, RTOS
- Microcontrollers/Boards: STM32, 8051, Arduino, MSP430, Raspberry pi
- Communication Protocols: UART, I2C, SPI, ADC
- UI Development: PyQt
- Operating systems and platforms: Linux, Windows, FreeRTOS, CMSISRTOS
- Tools and Frameworks: STM32CubeIDE, STM32Cube Programmer, VS Code, Keil

Work Experience

- Graduate Engineer trainee at ilensys Technologies Pvt Ltd, Hyderabad (June 2023 – December 2023)
- Junior Firmware Engineer at ilensys Technologies Pvt Ltd, Hyderabad (December 2023 – Present)

Projects Undertaken

1. Novasync – Unified Sensor Monitoring System

Duration: June 2023 – April 2024 (10 months)

Description:

Novasync is a compact, integrated environmental monitoring and control system designed for applications requiring precise sensing, actuation and real-time data analysis. It consists of multiple environmental sensors with a photometer, pH meter. This unified platform can be useful for laboratory automation, environmental quality monitoring, biomedical research.

Key Responsibilities:

- Developed real-time embedded firmware for sensor data acquisition, camera-based blood cell analysis, and peripheral interfacing (SPI, I²C, UART, ADC).
- Implemented PID-based temperature control for precise heating and cooling regulation.
- Designed and built a PyQt-based UI (frontend & backend) with multithreading for real-time visualization, monitoring, and user interaction.
- Migrated firmware to FreeRTOS, enhancing system performance, responsiveness, and task scheduling.
- Performed comprehensive testing and optimization of firmware and UI to ensure reliability and robustness.

2. PCR Thermocycler – Low-Cost DNA Amplification Device

Duration: May 2024 – December 2024 (8 months)

Description:

Designed and developed a portable thermocycler for rapid DNA amplification, enabling point-of-care medical diagnostics. Implemented precise temperature control for denaturation, annealing, and extension phases, achieving reliable results comparable to standard PCR machines at significantly reduced cost.

Key Responsibilities:

- Designed a portable USB-powered PCR machine using Arduino with PID-based thermal control.
- Developed complete firmware for temperature regulation, cycle automation, and UI handling.
- Implemented OLED display UI with rotary encoder for intuitive navigation and parameter configuration.
- Integrated EEPROM storage for persistent PCR parameters and safe power-loss recovery.
- Tuned and calibrated PID control to ensure precise, repeatable temperature profiles across all PCR stages.
- Authored detailed documentation including wiring diagrams, control logic, and user instructions for reproducibility.

3. Chart Recorder – Mechanical Temperature Logging System

Duration: January 2025 – Present

Description:

Designed and developed an electromechanical chart recorder for long-term temperature in refrigeration and controlled environments. This ensures a permanent,

tamper proof paper record of temperature trends, providing a reliable backup when digital systems fail or data is lost.

Key Responsibilities:

- Interfaced a PT100 RTD with a 16-bit ADC for high precision temperature measurement, including calibration for accuracy and stability.
- Developed control logic for a pen motor to plot temperature data and a stepper motor to rotate the chart at selectable time scales (24 hours, 1 week, 1 month).
- Implemented firmware routines to adjust motor speeds and plotting intervals based on user user-selected recording modes.
- Programmed continuous temperature sampling, filtering and mapping of readings to mechanical pen movement.
- Created clear technical documentation for firmware logic, calibration procedures and maintenance guidelines.
- Conducting thorough testing and validation of the device for better accuracy.

Achievements

- Conducted a workshop on embedded systems and design development for college students
- Successfully produced 25 PCR Thermocycler units for field use and received positive feedback from end users

Educational Details

Btech: Electronics and Communication Engineering, IIIT Ongole – 2023, 9.2 CGPA

Intermediate: Pre-university course, IIIT Ongole – 2019, 9.4 CGPA

SSC: BVRM Girls High School – 2017, 9.8 CGPA

Personal Details

Date of Birth: 6th January 2002

Gender: Female

Languages: Telugu, English, Hindi

Nationality: Indian

Declaration

I hereby declare that the information mentioned above is true and correct to the best of my knowledge and belief.

Place: Hyderabad

Signature: Purna Ramyasree Saniseti