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Hemanth S Kumar

Professional Summary

A highly motivated final-year Electronics and Instrumentation Engineering student with a strong passion for embedded systems, industrial automation, and hardware design. Possesses hands-on experience in building and debugging real-time hardware prototypes using microcontrollers like ESP32 and Raspberry Pi. Proficient in C and C++ for firmware development and skilled in using industry-standard tools like MATLAB, LabVIEW, and Cadence. Eager to secure a challenging role as an Embedded Systems or Core Engineer to apply a deep understanding of analog/digital circuits and control systems to innovate new technologies.

Technical Skills

- **Core Electronics and Hardware**: Microcontrollers (ESP32, Raspberry Pi, Arduino, 8051, AVR), Digital and Analog Circuit Design, Control Systems, Sensor Integration, PCB Design basics
- **Firmware and Programming**: C, C++, Python (for scripting and automation), Verilog
- **EDA and Simulation Tools**: MATLAB, Simulink, LabVIEW, Cadence, Multisim
- **Communication Protocols**: I2C, SPI, UART, CAN Bus
- **Developer Tools**: Git, Linux, VS Code

Key Hardware Projects

Real-Time Elevator Safety System (Ongoing)

Tech Stack: **ESP32, C++, HX711 Load Cell, GSM Module, Sensors**

- Engineered a safety-critical system with custom firmware in C++ to automatically detect elevator power failures and passenger occupancy.
- Integrated and calibrated an HX711 load cell to accurately determine if the elevator is occupied, a key logic component for the system.
- Implemented a GSM module to autonomously send SMS alerts to maintenance personnel during a power outage, ensuring rapid hardware response.

Multichannel Stethograph for Cardiac Monitoring (2023 to 2024)

Tech Stack: **Raspberry Pi 3B, Python, Vibration Sensors, Signal Processing Libraries**

- Developed a non-invasive cardiac monitoring device using a Raspberry Pi to capture and process heart signals from specialized vibration sensors.
- Implemented digital signal processing algorithms in Python to filter noise and analyze sensor data, successfully identifying key cardiac events from vibrations.

IoT Automation and Monitoring Prototypes (2023 to 2024)

Tech Stack: **ESP32, Arduino, C++, Various Sensors**

- Designed and built a series of IoT prototypes for home automation and environmental monitoring, focusing on robust hardware and reliable firmware.
- Successfully implemented firmware for real-time data acquisition from various analog and digital sensors, establishing wireless communication for remote control.

Problem-Solving and Algorithmic Skills

CodeChef, Remote

Data Structures and Algorithms Training (2 months, 2024)

- Completed an intensive 2-month program focused on core Data Structures and Algorithms, strengthening foundational computer science concepts essential for efficient firmware development.
- Solved over 100+ competitive programming problems in C++, honing skills in logic, optimization, and efficient coding practices.

Education

Expected 2026 **Bachelor of Engineering in Electronics and Instrumentation Engineering**, *Siddaganga Institute of Technology (SIT), Tumakuru, Karnataka*, CGPA: 6.05

Certifications

2024 **Data Structures and Algorithms**, *CodeChef*

2024 **C++**, *CodeChef*

2024 **SQL**, *CodeChef*

Leadership and Extracurricular Activities

2024 **Volunteer, Technisium Tech Event**, *Siddaganga Institute of Technology (SIT), Tumakuru, Karnataka*

Assisted in the organization and logistics for Technisium, the department's annual technical festival, contributing to its smooth execution for over 200 participants.