JATAN VIJAYKUMAR MANDALIYA

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EDUCATION

San Francisco State University, San Francisco, CA   Aug 2024 – May 2026 (Expected)
Masters of Science, Electrical and Computer Engineering   GPA: -/ 4.0
Courses: Embedded Systems, Advance Digital Design, Application Specific Integrated Circuits Design

L.D. College of Engineering – Gujarat Technological University, Ahmedabad, India   May, 2024
Bachelor of Engineering, Electronics and Communication   GPA: 3.76 / 4.0
Courses: Digital System Design, Microprocessors and Controller, Embedded Systems, Advance Microcontrollers, IoT.

EXPERIENCE

Tirex Chargers   Jan 2024 – May 2024
Embedded Hardware Intern   Ahmedabad, India

- Worked on EV chargers of 3.3KW to 250KW and contributed to designing of hardware boards (PCB), including both schematics and layout in Altium, with a focus on power design and load regulation.
- Debugged the hardware boards by identifying design flaws, testing signal integrity, and verifying voltage and currents. Utilized diagnostic tools like oscilloscopes, spectrum analyzers, multimeters.
- Studied and simulated closed loop Buck and Boost converters on MATLAB using PI (Proportional – Integral) with low noise margins and ensuring stable load and power regulation and designed logic of uninterruptible power supply (UPS) based on Op-Amp.

SKILLS

- **Programming Language:** C, C++, Assembly, Python, Verilog, Shell Scripting
- **Cloud Platform:** AWS, ThingSpeak
- **Operating Systems:** FreeRTOS, Linux, Windows, Bare-metal programming
- **Hardware:** Altium (Schematic & Layout), LTSpice, Datasheet, Reference Manual, Hardware Prototyping
- **Microcontrollers:** STM32L476, 8051, MSP430, 8086, ATMega328p, ESP32/ESP8266
- **Communication Protocol:** UART, I2C, SPI, USB, CAN, RF (BLE, Wi-Fi)
- **Development Tools:** Spectrum Analyzer, Oscilloscope, Signal Generator

PROJECTS

Custom RTOS on STM32L476|

- Developed a bare-metal RTOS for an ARM Cortex-M0+ core from scratch, implementing task scheduling, inter-task communication, and interrupt handling to support real-time applications.
- Designed and implemented a priority-based, pre-emptive RTOS scheduler with support for Round Robin, Cooperative, and Periodic scheduling methods to optimize task management and context switching.
- Integrated peripheral drivers (UART, SPI, I2C) into the RTOS, allowing seamless hardware interaction with sensors and actuators.

Energy Monitoring System |

- Developed a Smart Energy Monitoring System using voltage and current sensors to calculate and display power consumption, converting it into units of power used.
- Utilized ESP32 for Implementing OTA (Over-The-Air) updates for seamless system enhancements and maintenance and for system management, ensuring efficient data processing and transmission.
- Integrated IoT and ThingSpeak cloud platform to provide real-time energy data to users' mobile devices for easy access.

Smart Jacket for Mine Workers |

- Created a Smart Jacket for mine workers with MAX30100 oximeter, gas sensor, and temperature sensor for health and safety monitoring. Developed a network for real-time data transmission to managers for quick responses.
- Utilized wireless communication for safety management and continuous monitoring of worker conditions.

IoT Based Surveillance Rover |

- Developed an IoT-based Surveillance Rover with a camera on a pan/tilt platform using dual servos for 180-degree movement and integrated hardware servo control, and IoT-based remote surveillance.
- Set up a local server to stream live camera feeds and remotely control the rover and camera via a web interface.

ACHEIVEMENT

- **CVM'23 Hackathon Winner**