Unmesh Phaterpekar

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Education

University of Colorado, Boulder August 2023 - June 2025
Master's in Electrical and Computer Engineering, Embedded Systems (GPA: 3.61/4.0)
Courses: Embedded Systems Design, Principles of Embedded Software, Practical Printed Circuit Board Design, IoT Embedded Firmware, Low Power Embedded Design Techniques, Introduction to Power Electronics, High-Speed Digital Design

Dwarkadas J. Sanghvi College of Engineering August 2018 - May 2022
Bachelor's in Electronics and Telecommunications Engineering (GPA: 3.83/4.0)
Courses: Electronic Devices and Circuits, Digital System Design, Microcontrollers and Applications

Skills

Micro controllers	8051, NXP FRDM-KL25Z, Arduino, Jetson Nano, Blue Gecko, Raspberry Pi
Languages	C, Embedded C, Python
Peripherals	GPIO, SPI, UART, I2C, ADC, DAC, Timers
Software and Debuggers	Git, Simplicity Studio, STM32CubeIDE, MCUXpresso, Altium, KiCad, LTSpice, Gazebo, AutoCAD, SolidWorks, ADS, Hyperlynx, MATLAB and Simulink, Ansys HFSS

Experience

University of Colorado, Boulder **January 2025 - Present**
Graduate Teaching Assistant | Internet of Things – Embedded Firmware
- Guided students in troubleshooting and debugging IoT projects using the BLE stack on EFR32BG13 Blue Gecko Series from Silicon Labs and contributed to the course by resolving issues and enhancing projects.
- Reviewed and optimized students' embedded firmware code, improving error handling and peripheral communication and collaborated with the instructor to refine course content.

D.J. Sanghvi College of Engineering **March 2020 - June 2021**
Electronics and Simulations | ABU Robocon 2021
- Aided in designing circuits with microcontrollers such as Arduino DUE, Arduino UNO and selected as the Main Controller of Robot, securing an All-India Rank of 9 in the National ABU Robocon (2021).
- Liaised with the Mechanical department to manage real-time simulations in ROS and Gazebo under the Simulations Department, securing 5th place in the ABU Robocon MATLAB competition (2021).

EcoSys Efficiencies Private Limited **March 2020 - July 2020**
IOT System Development Intern | Google Firebase, Altium, Sublime Text
- Gathered and logged live warehouse data to Google Firebase for real-time inventory tracking, designing a web page with HTML, CSS, and JavaScript to display information into organized formats.
- Initiated hardware-based solutions with motion sensors for warehouse discrepancy detection and built an automated anti-theft system to enhance security and prevent inventory loss.

Projects

Pocket Ranger | Simplicity Studio, Altium, LTSpice
- Designed and programmed a low-power gaming system using two Blue Gecko MCUs, enabling Bluetooth Low Energy (BLE) protocol between a sensor-equipped controller (Stick Gecko) and a display unit (Screen Gecko).
- Integrated joystick, MPU-6500, ambient light sensor, and SH1107 OLED into a custom PCB, optimizing firmware for low-power efficiency with BQ25570 PMIC and solar/battery charging.

Eco Sensor System | Simplicity Studio, Visio, Arduino
- Devised a product for flammable gas and ambient light detection using MQ-2 and TEMT6000, acheiving 90% accuracy with ADC conversion and real-time display on a WS2812B RGB board via NZR protocol.
- Created GATT services for sensor data and integrated encrypted wireless communication and alarm systems to signal hazardous conditions in a client-server configuration.

Smart Security System | MCUXpresso IDE, Bare-metal, LogicPort
- Implemented a security mechanism using a PIR sensor, achieving 95% accuracy in detecting unauthorized access and reducing false alarms by 30% through an innovative hand gesture authorization system.
- Employed a security system using GPIO for the PIR sensor and I2C for the ZX Gesture Sensor, enabling real-time motion detection and triggering an alarm upon unauthorized entry to alert the user.