Abhinav Avula

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Education

Electrical and Computer Engineering, Bachelor of Science (August 2020 - Current)
University of Colorado-Boulder, Target Graduation - May 2024
Computer Science, Minor (March 2022 - Current)
University of Colorado-Boulder, Target Graduation - May 2024

Applicable Coursework

Introduction to Digital and Analog Electronics
C Programming for Electrical and Computer Engineers
Differential Equations
Linear Algebra
Data Structures
Programming with MATLAB
Embedded Software Engineering
Introduction to Circuits and Electronics
Digital Logic
Circuits as Systems
Programming Digital Systems
Electronics Design Lab

Certifications

Introduction to Python [Udemy]
Embedded Systems Bare-Metal Programming Ground-Up (STM32) [Udemy]

Technical Skills

Programming
- C, Embedded C, C++, Python, MATLAB/Simulink, Data Structures, GDB, LLDB, Valgrind, Github, JupyterLabs, VSCode, Eclipse IDE

Data Analysis/Libraries
- Pandas, NumPy, Matplotlib, JupyterNotebook

Hardware Description/Hardware Verification
- Verilog, SystemVerilog

Embedded Peripheral/Driver Development
- Interrupts, GPIO, UART, ADC, SysTick, I2C, SPI, LCD, DMA, Silicon Labs Thunderboard Sense 2, STMicroelectronics STM32 Nucleo-64

Computer/Digital Systems Programming
- Nios II Assembly, I/O, Interrupts, Caching, Pipelining, DE10 -Lite

Circuit/PCB/Schematic Design
- LTSpice, EasyEDA

Electronics Design
- Prototyping, Speed Sensing, Control Systems Design

Electrical Engineering Lab Experience
- Soldering, Hardware Debugging, Power Supply, Oscilloscope, Multimeter, Waveform Generator, Breadboard

Projects

ECEN 1400 Introduction to Digital and Analog Electronics Course Project - RC Car

- Simple RC car controlled via bluetooth phone application
- Used an Adafruit CLUE-nRF52840 Express with Bluetooth LE to control car via the Bluefruit Connect phone application
- Utilized CircuitPython bluetooth libraries and DS SolidWorks to design car frame
- Wrote code in CircuitPython to control the direction of the car

ECEN 2270 Electronics Design Lab Course Project - Robot

- Built a 4 wheel drive mobile platform robot
- Designed and implemented a motor speed sensor and a closed loop speed controller
- Altered to have have the frame of and imitate a GNK Droid from *Star Wars*
- Remote controlled via Bluetooth phone application
- Distance sensor to keep robot safe from collisions

ECEN 2370 Embedded Software Engineering Course Project - Accelerometer

- Utilized the SPI protocol to read/ write data from an accelerometer in C, linked clock trees, state machine, structs, and interrupts, for appropriate peripherals and functions.
- Wrote drivers for the Serial Peripheral Interface (SPI) communication protocol and the ICM 20648 accelerometer from scratch
- Thunderboard LED color would change depending on the angle of the board

CSCI 2270 Data Structures Final Project - Class Search Program

- Program in C++ utilizing the hashtable data structure to retrieve classes given the last name of a professor, searching from thousands of instances
- Utilized topics taught in class such as quadratic probing, open addressing , chaining, hash functions, hash tables, linked lists, and binary search trees