Monserrat Alvarez

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EDUCATION

University of California Davis Davis, CA
Bachelor of Science in Computer Engineering June 2024

PROJECTS

OBJECT DETECTION SYSTEM (CAPSTONE) January - June 2023

- Partnered with a team to design a prototype to detect objects for an autonomous car for the UC Davis EcoCAR team
- Contributed to the 3D printing of the enclosure and programming of the Jetson Nano and PSoC to display the distance of an object detected by an ultrasonic sensor on a computer's terminal and turn on an LED on when the distance is deemed unsafe
- Wrote a report and presentation detailing the hardware used, production cost, software flowchart, and other details

STEP COUNTER November 2022

- Worked with a team to design a wearable step counter that displayed the user's step count on an android application
- Designed a charge manager board on Altium to charge the battery and connect to a buck boost converter to power the device
- Programmed the device on a PSoC microcontroller and used a breadboard to connect all the components
- Used I2C, UART, and BLE to allow communication between the PSoC, accelerometer, and phone application

PACMAN GAME June 2022

- Created a pacman game using C and a TI CC3200 launchpad, with a teammate
- Displayed the game on an OLED display by using SPI communication and designed the sprites with an Adafruit library in Code Composer Studio
- Implemented HTTP and Amazon Web Services to automatically send the player's final score to their email

SOUND FOLLOWING ROBOT June 2021

- Programmed a robot to move towards sound using the TI MSP432 microcontroller and TI-RSLK Max robotics kit
- Built a microphone amplifier circuit used to detect sound on a breadboard and mounted it on the robot
- Measured and processed the audio signals in digital domain using an oscilloscope and Code Composer Studio
- Controlled the motors by generating Pulse-Width Modulation signals and reduced noise by implementing digital filters

FPGA BOARD DICE GAME June 2021

- Designed a counting dice game using schematic capture, digital logic, and Quartus on the DE10-Lite board
- Created truth tables, K-maps, and finite state machines to design all of the game logic and to display the score on a 7 segment hex display

POTATO SORTER October - December 2019

- Collaborated with a team to innovate a small scaled prototype of a potato sorter to help the UC Davis Student Farm
- Assisted in 3D printing parts and programming an Arduino to control servo motors to move a conveyor belt
- Presented the prototype to a group of judges, explaining the functionality, logic, and cost of the design

WORK EXPERIENCE

UC DAVIS COFFEE HOUSE September 2022 - June 2024

- Maintained a high standard of food safety and cleanliness by regularly checking the temperature of the food to ensure compliance with health regulations
- Worked in a fast paced environment and served customers efficiently and courteously in order to uphold customer satisfaction resulting in a base of regular customers
- Expedited service and created a positive work environment by collaborating efficiently with coworkers

SKILLS

Technologies: Quartus, ModelSim, LTSpice, Altium, OrCAD Capture CIS, GCC
Languages: C, C++, Python, Verilog, RISC-V assembly, MATLAB, VHDL
Interfaces: I2C, UART, SPI
Lab Equipment: Oscilloscope, Function Generator, Multimeter