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Semester: Spring 2024

Course: ECE445L

A) ***Objectives*:**

1. In a few sentences, describe the purpose of the lab:

B) ***Hardware Design Deliverables:***

1. Deliverable 1: Using **KiCad**, create a schematic for your design. Include a screenshot in the space below.

A computer circuit board with many different colored lines

Description automatically generated with medium confidence

1. Deliverable 2: Using **KiCad**, create a Layout for your design. Include a screenshot in the space below.

A blueprint of a computer chip

Description automatically generated

C) ***Software Design Deliverables:***

1. I have pushed my project to GitHub for grading (Yes/No): YES
2. Deliverable 3: System design diagram of the modules created.

A diagram of a program

Description automatically generated

D) ***Deliverables:***

1. Deliverable 4: Total cost estimate

I have updated the bill of materials (Yes/No): Yes

A screenshot of a computer

Description automatically generated

Out of pocket costs: $111.70

Adjusted competition costs: $55.77

1. Deliverable 5: Estimated current usage

A screenshot of a calculator

Description automatically generated

1. Deliverable 6 (5pt EC): TIW Training

Both Phebe and Neilan completed the canvas training and the in person training and printed prototypes of our design.

A screenshot of a computer

Description automatically generated

A screenshot of a quiz

Description automatically generated

1. Deliverable 7 (10pt EC): Discrete IC usage
2. Deliverable 8 (10pt EC): Characterization of the system

E) ***Analysis and Discussion Questions:***

1. How did you debug your system? How intrusive was it?

We used unit tests on each IC component by creating isolated test modules with individual initialization and test functions. This approach was minimally intrusive because we verified the functionality of each sensor/component individually. We have not yet implemented integration testing.

1. What’s the difference between unit testing, integration testing, and functional testing?

Unit testing involves individually testing each hardware component or each function in isolation. Integration testing involves testing how multiple components interact and ensuring that the data flow between them is correct. Functional testing involves evaluating the software functions’ behavior and ensuring that the behavior matches with system requirements.