

EE/CprE/SE 491 BI-WEEKLY REPORT 1

Start Semester – 2/18/2023

Group number:

sdmay23-41

Project title:

Automated Testing Station for Sensing Applications

Client &/Advisor:

Moneim Ismail

Team Members/Role:

Thomas McCoy - Group Organizer, Software developer

Matthew Rief - CAD designs/3D printing

Garth Anderson - PCB designs

Malvin Lim - PCB designs

○ **Weekly Summary**

Overall objective for this week was to get as close as possible to a testable design. Garth and Malvin continued working on PCB design, improvements, fixes, etc. Thomas continued work on the LabView program for project interface, and Matt started 3D printing components and continued work on DUT platform design.

○ **Past week accomplishments**

Thomas McCoy:

- Setup LabView at workstation, download libraries, and install device drivers.
- Start simple LabView programming.
- Began project program features:
 - LED blinking
 - Frequency control
 - Servo rotation control
 - Top/bottom servo select

Garth Anderson:

- Combined the two LED circuits and MFC system into a single microcontroller system that controls all peripheral PCBs.
- Searched for available components to use and had to ensure there were compatible KiCad footprints.
- Designed an interconnect wiring system to connect the controller circuit to LEDs and motors.
- Designed switching mechanisms for toggling top/bottom PCB which changed a few times (mostly due to miscommunication and Mo never sending the circuits he said that he would send at every meeting).
- Made the LED & photodetector circuit for our design, which changed several

times due to changing what kind of LED and op amp we should use and switching from a phototransistor to a photodiode.

- Had to check with ETG for a list of available op amps and go through datasheets to determine which could work. Also helped resolve overvoltage issues associated with our power supplies. Spent about 4-5 hours each week for the last 2 weeks.

Malvin Lim:

- Updated pins on PCB
- Assigned footprint for all of the components
- Created an estimated PCB design
- Reorganized components for space optimization

Matthew Rief:

- Modeled some test brackets to try out the fitment that will hold the DUT in place.
- Modeled some brackets that the servo motors will slot into to fix to the case later on.
- Design revisions

○ **Individual contributions**

<u>NAME</u>	<u>Individual Contributions</u> <i>(Quick list of contributions. This should be short.)</i>	<u>Hours this week</u>	<u>HOURS cumulative</u>
Thomas McCoy	LabView programming (3rd item down)	6	18
Garth Anderson	Last 2 items on the list above	5	16
Malvin Lim	Last 2 items on the list above	6	16
Matthew Rief	Last 2 items on the list above	4	14

- **Plans for the upcoming week**

Thomas McCoy:

- Continue project program features:
 - Connect to Keithley
 - Find a way to write analog 0-5V with arduino uno
 - Meet separately with our advisor.

Garth Anderson:

- Modify the LED and photodetector circuit again to switch from RGB to RGBW LEDs and implement an outside switch for toggling a common ground that will effectively toggle between top/bottom PCBs.
- Modify the microcontroller circuit and interconnect system to accommodate these changes.
- Design the PCB in KiCad for the LED PCBs and get exact measurements to be sent to Matthew for his 3D printed structures.
- Develop a parts list and ensure continuity with the footprints in KiCad.
- Make a pinout diagram for the microcontroller since it is different than Mo's original idea and you will need this for the software.

Malvin Lim:

- Get components availability from ETG
- Get the final Schematic for PCB and PCB design ready for the advisor to check.

Matthew Rief:

- Test how well 3d prints can hold a vacuum with some test chambers
- Acquire airtight coating from Ace hardware.
- Design the test chambers and look up how gaskets are supposed to fit to make it airtight with the lid.

- **Summary of weekly advisor meeting**

This week's meeting was a bit more informal, went over some communication problems, reviewed LabView program progress, and assigned work for the upcoming week.