EE / Cpr E / SE 492 - SDMAY 21 - 48
Learning Holiday Light Display
Week 5 Report
Mar 16, 2021 - Mar 29, 2021
Client and Faculty Advisor: Dr. Daniels

Team Members:

Christopher Woods - Chief Software Engineer
Ty Gardner - Chief Engineer (Computer Vision)
Jacob Martin - Chief Computer Engineer
Ashkirat Singh - Meeting Facilitator
Mitchell Wadle - Meeting Scribe
Joyeux Noel - Report Manager

Weekly Summary:

The objective for the past two weeks was to get the LEDs to display the pattern on the tree and our team was able to accomplish the following as well: set up the main sequence for the state machine on the new Tree Pi, and also set up the message queue suite, ZeroMQ, which would make it easier for the calibration process.

Past Week Accomplishments:

Mitchell: Assembled new lazy susan and ran tests on code for motor. (Please see the schematics below at the end)

Jacob: Helped Chris and Ash to get the main sequence working so that the LEDs display basic patterns successfully on the tree. Took photographs of the tree with only one LED lit in order to test the code for detecting the LEDs in the calibration process.

Joyeux: Helped Mitchell come up with the design and ordering of the parts that will be incorporated into the lazy susan.

Chris: Worked on the refactor of communication between the Camera and Tree Pi and state management using ZeroMQ, a message queue suite, and also helped Jacob and Ash with getting the LEDs to display a few patterns successfully on the tree.

Ty: Helped with the image processing procedure such that once everything is put together, the animation process is streamlined with the calibration of the LEDs.

Ash: Helped Jacob and Chris with getting the LEDs to display several patterns on the tree; debugged the code in the main sequence in order to get the calibration process started.

Pending Issues:

- Test all the code that was created while the new Raspberry Pi image on the new SD card got set up, and begin testing the calibration procedure for detecting the LEDs
- Motor for lazy susan wasn't strong enough to turn lazy susan

Individual Contributions:

Team Member	Contribution	Weekly Hours	Total Hours
Jacob Martin	Installed the Raspberry Pi OS, and successfully established the connection between the Pis, as well as the web server on the new SD card	16	56
Chris Woods	Started refactor of communication between the Camera and Tree Pi	16	60
Ty Gardner	Refactored image processing to map images in a circular format from top-down perspective on the tree	14	53
Ash Singh	Helped get the libraries installed so that the LEDs on the tree light up when we run the main sequence	16	57
Joyeux Noel	Helped Mitchell with ordering the parts that would be used for motorizing the Lazy Susan	14	48
Mitchell Wadle	Assembled lazy susan and compiled and tested code written for stepper motor.	12	48

Plans for Coming Week:

- Lazy Susan - Joyeux and Mitchell
  - Get a better motor as the one we currently have is not strong enough to turn the tree. Add a 360 degree power ring to susan to power the control box. Assist other teams as the lazy susan is near completion.

- Animation - Ty and Ash
  - Run tests on the code for the animation feature and make sure that the current configuration (top view of the tree on a 2-D plane) gets rendered properly when the pattern is displayed onto the tree

- Calibration - Chris and Jacob
  - Run tests on the code for the calibration and make sure no issues that haunted the team previously persist on the new image of the Raspberry Pi OS

Diagrams/Drawings:

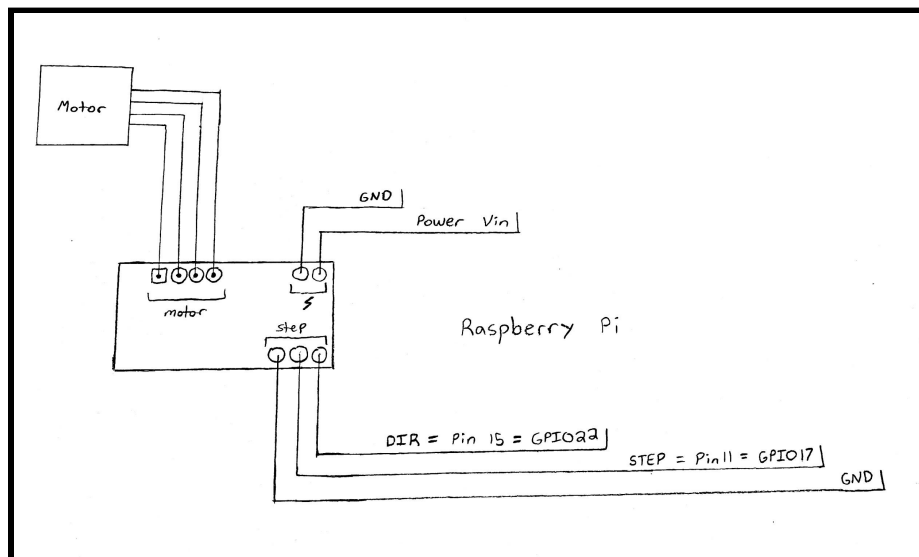The following figures show the current progress and plans for working with the Lazy Susan:

Fig 1. Diagram of motor connected to driver

12" lazy susan
6" gear track with gears
ROB-12779 Stepper Motor Driver
ROB-10551 Stepper Motor

Gear and track
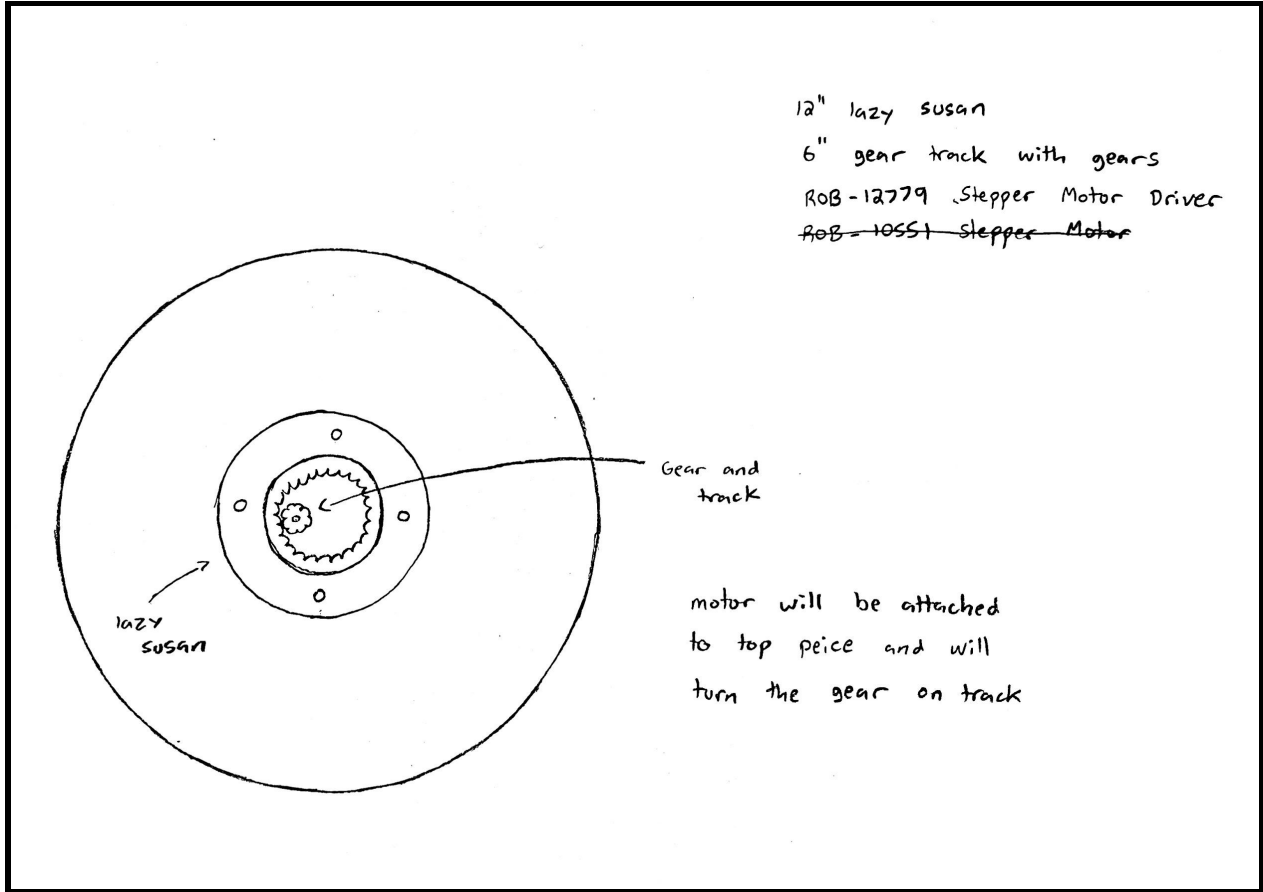
motor will be attached to top peice and will turn the gear on track

lazy susan

Fig 2. Sketch of base of lazy susan with gear