

EE/CprE/SE 492 SDDec19-10

Programmable Holiday Lights

Week 1 Report

9/2/19 - 9/13/19

Client: Dr. Tom Daniels and Wife

Advisor: Dr. Tom Daniels

Team Members:

Jake Grace - Software Lead

Joe Nunez - Meeting Scribe

Chad Griggs - Report Manager

Val Smith - Signal Processing Specialist

Thien Nguyen - Front End Dev/Web Master

Steven Williams - Hardware Lead

Past Week Accomplishments:

- Fixed light code
- Ordered new parts (new power converter, new light strand)
- Replaced dead light strand with new working one
- Updated web server with code developed over the summer
- Abstracted some RGB logic into classes/methods to make using the strand more dev-friendly
- New buck power converter was tested and set to output 5V. The old perf board that had the 7805 voltage regulator and logic level shifter was removed and replaced with the buck converter

Pending Issues

- OpenCV build runs into errors. 'File truncated...' May need a bigger SD card to increase space available and memory.
- Need a plan of attack for the image recognition
 - Come up with a naive openCV implementation to match the website json data to the light strand
- Buck converter heatsink is connected to Vout, rather than ground. Could cause a potential short if not properly insulated

Plans for Coming Weeks

- A plan for the insulation of the buck converter must be decided. The current idea is to insulate it with hot glue, this action should be taken before we test it inside the system in case the heat sink contacts the power supply and causes a short.
- Test the buck converter while running the lights to verify the new power solution works. We need to verify that it can output enough current to run the pi.
- Long term goal is to measure and record characteristics of the circuit to make sure they are as expected while also verifying the signal integrity of the data line to the lights.

Individual Contributions

Team Member	Weekly Contribution	Weekly Hours	Total Hours
Jake Grace	Met with most of the group for a general 'where did we leave off', ran into a few issues but were later resolved. Then came back a few days later for major code updates. Pushed changes to Git. (tried to) compile openCV.	15	15
Joe Nunez	Met with the group to get the project rolling from where we left off last semester. Helped fix an issue that was causing the programmable lights to not turn on. Went through the test code provided by the Light library that we're using to run examples and to figure out how to properly control the lights. Also met with Steven individually to figure out some aspects of the project that we'd like to change.	6	6
Thien Nguyen	Assisted in Troubleshooting why the lights code would not operate on the hardware.	5	5
Chad Griggs	Helped Steven removed the old power board and install the new buck converter.	4	4
Valery Smith	Got one of the IP displaying LCDs working. Met with team for meetings. Determined distance needed between camera and tree. Ordered and procured new parts including buck converter and plywood. With Steve wrote Python script to take an arbitrary number of pictures and took a bunch of pictures with only one light on for training. Went with Steve to Boyd lab to have plywood cut. Wrote and researched python script to automate picture taking.	12.5	7
Steven Williams	Met with the group getting to where we left off/what progress we made over the summer. After receiving the new parts, Chad and I ripped out the old power distribution, we installed the new buck converter and will see how well it works. Also uploaded the web interface I developed over the summer to the	15	15

	Pi.		
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