EE / CprE / SE 492 – SdDec21-20
IoT Smart Lights
Bi-weekly Report

11/8 – 11/22
Client: Dr. Manimaran Govindarasu
Faculty Advisor: Dr. Gelli Ravikumar

Team Members:

Hamza Mostafa Sayed Mahmoud	habdul@iastate.edu	Hardware Design
William Gavins	wpgavins@iastate.edu	Hardware Design
Xinlei Yu	xinleiyu@iastate.edu	Software Design
Nathan Orts	njorts@iastate.edu	Software Design

Summary:

- Integrating the GUI with the controller software.
- Binary Simulation files from PowerCyber Lab simulation can be stored locally with mySQL
- Charging Circuitry testing (MCP73832). Testing wirings, voltage regulator inputs and output signal.
- PCB Was redesigned with JLCPCB Assembly in mind, When validating bom through them found some parts that weren't able to be alternatively sourced with minimum quantities sold in reels rather than individual parts. Tried to use other resources to make the pcb turnkey assembled, but ended up having to move on. Redesigned PCB rev C using an improved version of rev A charging circuitry with added protection. Designed with hand soldering in mind.

Past Week Accomplishments

- GUI software
  - Worked on light configuration page.
    - Adding light to database
    - Editing light
    - Getting light table
  - Worked on integrating with the control script.

- Software Scripts
  - Reconfigured database to adapt to integration. Added field "Relay", "Parent_Relay".
  - Modified mysql function to errors handling.
  - Moved the scripts and database to VM provided by Client and Advisor. Program can run on the VM.

- Hardware
  - Fixed Config issues with Xbee s2c wireless devices
  - Shrunk down footprint for PCB.
  - Redesigned PCB with assembly in mind, JLCPCB is able to do smd assembly to some degree, meaning we can avoid hand soldering many components.
    - Redesigned again, after several parts from JLC were minimum quantity >4k. Decided to use a soldering stencil +parts from digikey.
    - Re-analyzed the pcb design by checking values from datasheets, and corrected several components.
  - Tested Charging circuit design by testing the input and outputs of voltage regulator and the signals on the MCP73832

Pending Issues

- Hardware
  - Assemble PCB upon acquisition.

- Software
  - GUI
    - Light configuration page incomplete.
    - View simulation page incomplete.
  - Software
    - N/A

Individual Contributions

Team Member	Contribution	Weekly Hours	Total Hours
William Gavins	Complete PCB redesign for surface mount compact with intention for much smaller parts, after some BOM issues with JLCPCB Assembly halted that, redesigned for hand solderable parts with a soldermask + reflow gun by hand.	35	103
Hamza Mostafa Sayed Mahmoud	Soldering connections on the PCB Researched vSphere client in and out serial signal. Testing PCB Design Testing charging circuit	9	30
Xinlei Yu	Python app development - Software/Hardware interfacing.	6	41

Nathan Orts	Python app development - GUI	6	63

Plans for Coming Week

- Nathan - Continue GUI development.
  - Complete light configuration page.
  - Continue integrating with other software components.
- Xinlei
  - Integrate with UI and Xbee coordinators
- Hamza - Testing New revised circuit board.
- William- Assemble PCB, integration + debug.