EE / CprE / SE 491 – sddec19-12

Campanile-Carillon Model Phase II

Jan 2019 – Dec 2019

Client: Dr. Tin-Shi Tam

Faculty Adviser: Dr. Gary Tuttle

Team Members

Ryan Roltgen – Software Engineering – Meeting Scribe

Sam Habel – Computer Engineering – Meeting Facilitator

Yicheng Hao – Electrical Engineering – Power Systems Lead

Gabriel Stackhouse – Software Engineering – Software Lead

Kienan Otto – Computer Engineering – Report Manager

Grant Mullen – Computer Engineering – Integration Manager

Weekly Summary

This week was heavily focused on analyzing our current software and hardware viability. We spent time optimizing our code to determine if the hardware was truly adequate for our needs. Assuming we have the correct hardware selected, we made a decision on our power system and created a Bill of Materials to acquire those components. Additionally, our power system should be capable of handling a more power-hungry system for the required time if we so choose to upgrade.

Past Week Accomplishments

- Realize during testing that the Raspberry Pi slows down too much while running the MIDI files - Ryan, Kienan, Gabe
  - Spent time figuring out ways to optimize code to make the program run better on the Pi
  - Optimized code to see if FPS improvements happened
  - Figured that the CPU is bottlenecking too much that either the performance is going to be poor or more powerful hardware is necessary to run this program
- Team website updates started - Sam, Ryan
  - Project plan attached
  - Member bios expanded

- Raspberry Pi alternatives researched - Sam, Gabe
  - May need something with more rendering power if the code can't be optimized enough
- Bill of materials BOM sheet - Grant, Yicheng
  - Power supply system bill added
- Research possible battery voltage monitoring solutions - Grant, Yicheng
  - Found several possible solutions. One could be integrated into the code for our existing atmega chip or a stand-alone chip could handle it. Also possible to get a of the shelf solution.

Pending Issues

- Raspberry Pi is still slowing down during the PlayState and we are out of ideas to optimize the code to improve performance significantly enough to keep using the Pi
- Light bar doesn't update if the Raspberry Pi is being slowed down
- Known bug: Last LED lit up when the song ends remains on
- CAD file of the carillon model needs to be looked at more

Individual Contributions

Team Member	Contributions	Weekly Hours	Total Hours
Ryan	Worked on optimizing code for the PlayState.cpp to hopefully make it run better on the Raspberry Pi otherwise we may look into other options for hardware.	6	25
Sam	Worked on updating the team website, researched possible Raspberry Pi alternatives, researched container solutions for hardware	5	21
Yicheng	Worked on finding the charger, battery, inverter, and wire. Finished the first version BOM sheet of the power system.	6	22
Gabe	Worked with Kienan and Ryan on optimizing code for better performance. Spent time testing changes to see if improvements were made. Researched Raspberry Pi alternatives when it became clear it was needed.	6	25
Kienan	Debugging and optimizing code to improve performance on any device running code. Adjusted settings for best appearance at predicted resolution.	5	22

Grant	Selected suppliers for various components of the power system. Did approximate battery life and charge time calculations. Researched different battery voltage monitoring solutions.	7	23

Plans for the Upcoming Week

- Make a decision about Raspberry Pi alternatives
- Continue updating team website
- Further optimize code if possible
- Meet with client and advisor
- Meet with the ME team
- Submit a parts order