

EE/CprE/SE 491 WEEKLY REPORT XY

8/30/2021-9/13/2021

Group number: 18

Project title: Batteryless Game Device

Client &/Advisor: Henry Duwe

Team Members/Role:

Shivam Vashi- Software Lead

John Brose - Power Systems Engineer

Daniel Lamar - Test Engineer

Franklin Bates - Microcontroller Engineer

Jake Larimore - Integration Engineer

o Weekly Summary (Short summary about what the group did for the week. This should be about a paragraph in length. These are just a few questions to help you get started. What was the overall objective for the week? In general, what tasks were completed? Were there any changes made to the project?)

On the software side, we started to create the framework for the code so that integration of hardware and software can go as smoothly as possible. As for hardware the objective for the past week was to test the input power management system to the device. This led to needing to create two pcbs to test the power management system due to the IC packages being quite small meaning a breakout board was required. Rather than buy from the market, we created our own so as to be cheaper and also to incorporate multiple passive elements into a smaller area and make testing easier. Overall, this week fundamental building blocks needed to expedite the completion of the project were thought of, created, and ordered.

o Past week accomplishments (Please describe/summarize as to what was done, by whom, when and, collectively as a group. This should be about a paragraph or two in length. Bulleted points are acceptable as well. Please keep only your technical details related to your project. Figures, schematics, flow diagrams, pseudocode, and project related results are acceptable, but please ensure that they are legible (clear enough to read) and to provide an explanation. If researching a topic, please add a few details about what was learned and how it is relevant to the project. If two or more people worked on a single task, be sure to distinguish how each member contributed to the task. Specific details relating to the assistance provided to other members may be included here. Do not include classwork, such as individual reflection assignments, and group meetings as part of your duties.)

Shivam Vashi: Began working on the framework to implement code. Also created the basis for the room challenge with a way to simulate input when there is no connection between the physical device and the software yet.

Franklin Bates: Worked on creating the SPI control for the MSP430 MCU. Established a base construct for testing validity of information transferred using the interface. Began working on creating libraries for use by software to interact with the interface.

Jake Larimore: I worked with John in making basic PCB breakout boards so we can breadboard our chips for testing purposes. I also set up a weekly meeting with Dr. Duwe and ordered a list of parts for the hardware portion of this project.

John Brose: Worked with Jake to create two breakout boards for testing energy harvesting and storage of energy for the system. Ordered the two pcbs from etg as well as specked out parts that needed to be ordered alongside the pcbs.

Daniel Lamar: Began writing a thorough testing plan for the semester with deliverables, unit tests, and who will be completing each test. The plan encompasses software, hardware, and physical tests that need to be completed throughout the semester. I also began designing the mechanical system that will be used in the crank generator system.

o Pending issues (If applicable: Were there any unexpected complications? Please elaborate.)

Shivam: We don't have a lot of exact specifications for what is considered a fair difficulty for things like the room challenge and what data that would be, so in order to test the room challenge, dummy data was created with a method that currently reads the file. For the future, I may want to have a file that is read from for each instance of checking what is a reasonable value to compare to for the challenge rooms to avoid a costly refactor.

Franklin: The E-Ink display comes with libraries that are developed for other devices however none that can be easily tailored to our specific microcontroller. This does not appear to be a large problem as the libraries for the RaspberryPi interface are written in C and I believe can be used as a framework for understanding how the interface must interact with software we create.

Jake Larimore: Nothing as of yet. There most likely will be once we get testing.

Daniel Lamar: The physical size constraint of the crank generator system makes it difficult to integrate mechanical system. This will be easier to implement once the device shell is created.

John Broe: Availability of equipment needed to solder such small parts.

o Individual contributions (Creating this section is optional, but it is Required to include the "Hours Worked for the Week" and their "Total Cumulative Hours" for the project for each member somewhere relevant in your report. Your individual weekly hours should be at a minimum of 6-8 hours for this course. So please manage your time well. Also, ensure that individual contributions support your claim to the weekly hours. Be honest with the reports.)

Name	Contributions	Hours Worked this Week	Hours Cumulative
Shivam	Began Coding Framework, Room Challenge	8	14
Jake Larimore	Ordered Parts, Setup weekly meeting with Dr. Duwe, helped John with making PCB Breakout boards.	4	6
Daniel Lamar	Developed a testing plan for the remaining semester, Began mechanical design for the generation system	2	6
John Brose	Designed and ordered pcbs. Specked out parts to be ordered.	3	6
Franklin Bates	Designed SPI interface initialization for the MCU. Worked towards creating libraries for the E-ink display interaction.	4	8

o Comments and extended discussion (Optional)

Feel free to discuss non-technical issues related to your project.

o Plans for the upcoming week (Please describe duties for the upcoming week for each member. What is(are) the task(s)?, Who will contribute to it? Be as concise as possible.)

Shivam Vashi: Continue to implement the framework by creating a file that hosts all values compared to for challenges and the like, add in the main function to call room challenge, and then work on room generation.

Franklin Bates: Over the next two weeks I will be working on testing the SPI interface initialization and information transmission validity. If this is successful I will be working further on creating the library for working with the E-Ink Display via software interface.

Jake Larimore: Once we acquire parts and PCBs, we can get to testing our initial schematic.

John Brose: Once boards and parts come in the plan is to solder up the boards, test the functionality in a controlled manner, and then iterate or move on to other systems depending on the outcome.

Danie Lamar: I will communicate testing plans with the group, revise out gphant chart, and determine the next steps to take as a group once I complete the mechanical design of the crank generator. This may include developing the physical shell of the device.

o Summary of weekly advisor meeting (If applicable/optional)

(Provide a concise summary on the contents and progress made during the advisor meeting.)

N/A