EE/CprE/SE 492 WEEKLY REPORT 4
Oct. 3- Oct. 31

Group number: 17
Project title: SmartPark
Client &/Advisor: Md Maruf Ahamed

Team Members/Role:
William Clemmons - Project Lead and Software Designer.
Kennedey Reiling - Client Interaction and Hardware Design.
Brian Witherspoon - Hardware and Software Design.
Mubassir Serneabat Sudipto - Client Interaction, Quality Control, and Software Design.
Zachary Sears - Hardware Design and Quality Control.
Ethan Haberer - Hardware Design and Quality Control.

Weekly Summary

Since the previous report, the software team has made multiple advancements on our application and server development. The application team successfully finished the visuals on the home page which includes the search bar, map view, and navigation bar. We completed the debugging of the search bar for a more visually appealing design. We began the development of the Stripe API payment page. We believe that the code is completed, however, implementation has not yet been completed. The server team designed the database to ensure it holds all of the necessary information. An ER diagram was created to complete this task. Next, we tested with a Flask mock-server to allow further testing. In the last week of this period, we finished the cosmetics of the payment page for the application.

The hardware team created a library that allows WiFi connectivity. Using an HTTP client, we tested the communication between our hardware and server. We completed a design for a potential PCB board and updated the schematic for the hardware. We were also able to successfully receive data from the sensors while being connected to WiFi, and the data is displayed in the console. Additionally, the hardware team created a mock server to test the device's communication. They also created code for an LED area that will allow users to visualize the state of each parking spot.

The team began testing communication between hardware and software.

Past week's accomplishments

- Hardware
    - Received data from the 4 ultrasonic sensor Arduino System.
    - Integrating the 4 ultrasonic sensor systems to connect to WiFi and registering our boards to the Wifi to allow for connection ease.
    - Started testing how to upload the sensor data to a server using Arduino HTTP Client library
    - Created a PCB design and schematic for the 4-sensor system with RGB LED included.
    - Got our system to connect to our mock server
        - Implemented a get, post, and put request
    - Merged all code branches into the main branch
- Software

- App Development
  - Got the payment page to function.
  - Payment page cosmetics have been completed
- Server
  - Completed making the test server for the project.
  - Tested possible and suitable database options.
    - Choose a final database
  - Designed a database model
    - Implemented model
  - Defined all requests needed for the application
  - Started implementation of our final backend

Pending issues

- The code for the Stripe API is complete, however, implementation has proved difficult.
- Trying to create a UUID(Universally Unique Identifier) for our mock server for Arduino testing.
- Figuring out the HTTPClient library (Arduino) in correlation with sending/receiving data from the server

Individual contributions

Name	Individual Contributions	Hours this Week	Hours Cumulative
Software Team			
William Clemmons	• Finished integrating the home page components together. • Started developing a mock server to use to test databases. • Helped other members out with various tasks. • Set agenda for team meetings. • Completed the Database implementation • Defined all requests needed for the backend	30	77
Ethan Haberer	• Created a Navigation Bar on the application. • Integrated a search bar to allow users to search for lots. • Learned cooperative coding techniques • Completed Stripe implementation • Began design of main payment page • Debugged Payment Page and Stripe API • Finished payment page cosmetics	29	71
Mubassir Serneabat Sudipto	• Created the ER Diagram for the project using MySQL Workbench and visualized how the schema would work with tables, connections, and keys. • Created the complete database schema for the project using MySQL and optimized it to align with	34	77

	project specifications. ● Started proceeding to deploy and host the server to a mock server called “Flask” for testing purposes. ● Started proceeding to work with Express JS and using it to host the server for the project. The development and deployment is still in progress. ● Started working on updating the senior design project website and updating it as per the team's demands and preferences.		
Hardware Team			
Zachary Sears	● Created a WiFi connection library for hardware. ● Consolidated WiFi connection and sensor array code into one file and tested the system. ● Registered Arduino boards with IT to continue WiFi testing. ● Created a GitHub repository to streamline program development. ● Continued work on sensor array library ● Began testing HTTP requests ● Consolidated sensor array, wifi connection, HTTP request, and new LED management code into a single branch on GitHub	31	73
Brian Witherspoon	● Looked into potential options for an LED display ● Integrated RGB LEDs into our circuit design. ● Created an LED array function that will light an LED a certain color based on the status of a parking spot. ● Looked into the dimensions of our circuit to find an electrical box that will store our circuit and placed an order for one. ● Modularized our code by creating a library for our WiFi connection. ● Researched the possibility of using thermal bubbles for our weatherproofing. ● Successfully post and pulled data from our mock server ● Researched PCB design and whether our design warranted building one.	29	71
Kennedey Reiling	● Created a PCB design for our 4-sensor system with a RGB LED. ● Registered our NANO boards to the Iowa State WiFi network. ● Integrated the wifi to the 4-sensor system. ● Started testing how to upload the sensor data to a	27	75

	server through HTTPClient. ● Met with our team to discuss how we will integrate our hardware and software. ● Met with our client and our professor to check in and give updates ● Started testing how to upload the sensor data to a server through HTTPClient ● Researched and ordered parts for our final hardware design ● Got the sensor data to connect server ● Researched and ordered parts for our final system (● Created a function to take in a distance and determine if a car is there or not ● Started looking into LED display ● Created a setLED function for the display ● Created a post request to the server ● Simplified the code		

Comments and extended discussion

Plans for the upcoming week

- Hardware:
  - Figure out code for multiple RGB LEDs
  - Connect hardware to the software team's mock server
  - Extend library functionality to clean up files
  - Document our code in more detail
- Software:
  - Begin implementing the requests needed for the backend
  - Implement more frontend functionality by mocking request
- Team:
  - Meet with our advisor.
  - Complete the in-class tasks.
  - Meet with Dr. Shannon to discuss our problem statement, user needs, requirements, and engineering standards.

Summary of biweekly advisor meeting

- *10/1: updated our advisor on what we have been working on the past couple of weeks. Discussed our plans for the upcoming weeks. Specifically creating a design for a PCB and how we are planning to power our system.*
- *10/15: Demonstrated our circuit to the advisor as well as updated him on integration design. Decided to make the switch to perf board instead of PCB. Discussed what the design of the final product for the app would look like.*
- *10/29: updated our advisor with what we have been working on for hardware and software and explained how we will begin combining the 2 teams to work towards our final design.*