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

This week, we made solid progress on both the hardware and software parts of the parking system. On the hardware side, we connected four LEDs to show whether parking spots are available, and these LEDs light up based on the readings from the ultrasonic sensors. The setup was done on a perforated board, and we organized the trigger and echo pins for the sensors into an array. A function was also created to initialize the sensor array. On the software side, we made sure the code supports HTTPS for WiFi and works well with the sensor array. All of the changes were successfully added to the main code. We also ran some tests and found that the LEDs correctly respond to the sensors, turning on or off depending on whether the parking spots are occupied. Next steps will include refining the code to improve reliability and making the system more stable.

Past week's accomplishments
- Hardware
  - Got 4 LEDs to light up according to the parking spots
  - Received data from the 4 ultrasonic sensor Arduino System and used this data to look up the LEDs accordingly.
  - Started prototyping the hardware on perforated board
  - Created an array for trigger and echo for the sensors and created a setup function in the sensor array
  - Restructured the code libraries (added https to WiFi and led to sensor array)
  - Merged all code branches into the main branch
- Software
  - App Development
    - Mocking the server to test sending and receiving request
  - Server
    - Implementing the following server request
      - getLocation - List all the locations/lots in our database
      - getOneOpen - return one spot at the lot that is open

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.
- When trying to access the Arduino timer/counter registers, we overwrote one of the register flags, causing the Arduino's code to not upload to the boards. We are working to reset the Arduinos and get new ones as backups.

Individual contributions

Name	Individual Contributions	Hours this Week	Hours Cumulative
Software Team			
William Clemmons	● Assisted teammate is making progress on backend and frontend	5	82
Ethan Haberer	● Created markers on map that indicate parking lots ● Began using a mock server for requests pertaining to the front-end of the application. ● Debugged the map and payment pages	12	83
Mubassir Serneabat Sudipto	● Started working with Express JS and hosting the project's server with it. Development and implementation are still ongoing. ● Began updating the senior design project website in accordance with the team's requests and preferences.	6	83
Hardware Team			
Zachary Sears	● Implemented an interrupt system to time measurement intervals for the sensors ● Began documentation of hardware code ● Expanded libraries to accommodate new functionalities	10	83
Brian Witherspoon	● Researched RTC configurations to implement into our project ● Worked on trying to implement timers that would allow us to take 5 distance measurements in a short span of time to take the average distance ● Created sensor arrays that will allow us to set up multiple sensors all at once ● Modularized our code by moving functions to their respective libraries and cleaned up the main file	14	85

Kennedey Reiling	● Created an array for trigger and echo for the sensors and created a setup function in the sensor array ● Restructured the code libraries (added https to WiFi and led to sensor array) ● Met as a team to give updates and start integrating the 2 parts of the project ● Professor meeting ● Wired and tested 4 LEDs ● Started soldering the prototype for the project using perforated board ● Helped troubleshoot how to use the Arduino timers	16	91

Comments and extended discussion

Plans for the upcoming week

- Hardware:
  - Research how to implement Arduino interrupts
  - Implement Arduino interrupts
  - Continue prototyping on the perforated boards
  - Design a system to take an average of several measurements to send to the server
- Software:
  - Continue implementing requests on the server
  - Show locations on the map in the app
  - Complete front-end development
- 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
- *Upcoming on 11/25/2024*