EE / CprE / CybE / SE / SD 491– sddec24-17

SmartPark: IoT-Driven Automatic Parking Solution

Week 2 Report

Feb 07 – Feb 13
Client / Advisor: Md Maruf Ahamed

Team Members:

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.

Past Week Accomplishments

- Hardware Team:
  - We created the Arduino code to use the IR emitter and receiver.
  - We discovered that the IR could emit and receive data for the length of the TLA.
- Software Team:
  - App research
    - We researched different coding methods, such as native or cross-platform (hybrid) development.
    - We studied multiple app architectures like monolithic, peer-to-peer, and micro-service structures.
    - We found numerous frameworks (Apache Cordova and React Native) and discussed which would be most beneficial for our team.
  - Payment Research
    - We researched different APIs we could use in our mobile app to accept payments. Focused on ease of use and cost since we don't have long to work on it. The following options were investigated:
      - Stripe.
      - Braintree.
      - Square.

Pending Issues

- We have learned that the Apple Developer Program costs $99 annually to upload apps to the App Store. Eventually, we will need this amount to continue our app development.
  - We will also need an Apple device for development because we cannot emulate iPhones on Windows or Linux machines.
- We should consider getting more Arduinos so that the hardware team can work on different parts of the hardware simultaneously.

Individual Contributions

Team Member	Contribution	Weekly Hours	Total Hours
William Clemmons	Started researching what services we could use to collect and monitor user payments.	5	8
Kennedey Reiling	Started prototyping with Arduino Kits. Figured out how to set up the IR sensor for future prototyping.	5	7
Brian Witherspoon	Started researching and developing a prototype with Arduino Kits. Also, I was successful in setting up the IR Sensor detection.	5	7
Ethan Haberer	Started researching potential app frameworks and strategies to develop our application.	5	7
Zachary Sears	Got successful in setting up the Arduino Kits to test an infrared emitter/receiver pair to send and receive signals.	5	7
Mubassir Serneabat Sudipto	After researching the best server options for our project, MySQL will be used for database storage and management. I also looked into cross-platform languages like Flutter and React Native for our project app framework. I also started learning about Flutter and React Native, which will help me understand their use in cross-platform app development.	5	8

Action Table

We have been told that a task board would be beneficial to include in our weekly reports. This has been included in the link provided.

Plans for Coming Week

- Hardware Team:
  - We will get the receiver's output to print in the console instead of lighting up an LED on the device.
  - We will start trying to get the LCD screen to work as a console and communicate to the "user" effectively.
  - We are researching IR emitter/receiver protocols for the parking lot sensors we plan to implement.

- Software Team:
  - We will continue researching mobile, payment, and server options to educate ourselves so we can make the best possible decisions regarding our project.
  - We will start deciding on a coding language for the front and the back end to allow us to begin development.