SE 491-sdmay19-27

Smartphone Tracking App for Microsoft HoloLens

Week 4

09/22/18 - 09/28/08
Client: Optical Operations
Faculty Advisor: Daji Qiao

Team Members:

Ben Holmes - *Android Development*
Anthony House - *Website Development/Security*
Ryan Quigley - *Database Admin*
Jose Lopez - *Website Development*
Travis Harbaugh - *Hololens Development*
Cory Johannes - *Report Management*

Summary:

The goal of this week was to finalize the first version of the project plan. We agreed on the project scope. Our team worked on redefining our functional/non-functional requirements and constraints that we previously identified last client meeting. We discussed the operating environment of our project. We identified the hazards that our end project is expected to encounter. We completed the previous work literature by performing an analysis on the indoor techniques to differentiation from what already exists on the market. We worked together on the timeline to figure out the deliverable and goals that our team wants to accomplish by the end of this semester. We finished up the week by creating the project design.

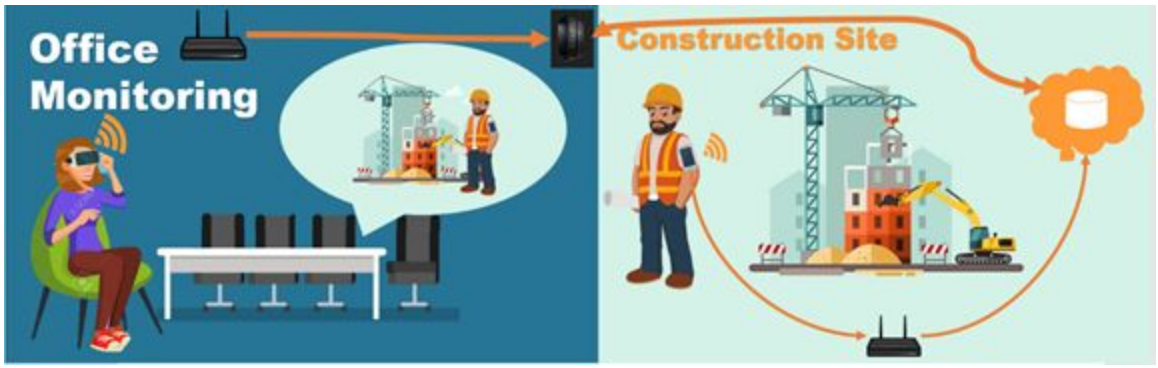
Pending Issues:

- Getting access to the clients repo for microsoft HoloLens
- Getting access to the clients Microsoft Azure account
- Set up real time website display
- Set up the backend with MongoDB
- Update the weekly reports
- Improve the Project plan documentation

Past Week accomplishments

- Travis Harbaugh
    - Created conceptual diagram, Gantt charts, and worked on the project plan.

    - Designed the conceptual sketch of our project to explain how our mobile product and AR solution monitor construction workers onsite.



    - Project Plan
        - Wrote the constraints, Functional/Non-Functional requirements, Operating Environment, Project statement, Acknowledgement, previous work/literature, Timeline, and design.
    - Created Gantt charts
        - Created a detailed Gantt chart that estimates the tasks that our team will perform during the fall/spring semesters.
    - Previous work and literature
        - Analyzed the team research to identify current solutions.
- Ben Holmes
    - Began trying to implement time of arrival methods in the Android application.
    - Still continuing to learn more about how RSSI values can be used to triangulate a user's location. RSSI and Bluetooth seem error prone.
    - Phone orientation is also becoming more important. We need a way to track the phone's orientation in 3D space. How will we know if someone is bending over, and facing a certain direction?
- Anthony House
    - Documentation for the client and organizing team / events.
- Ryan Quigley
    - Experimented with mobile orientation measurement.
- Jose Lopez
    - Updated map img on website for server
- Cory Johannes
    - Began modeling Durham in Unity

Individual Contributions:

Team Member	Contribution	Weekly	Total Hours

		Hours	
Ben Holmes	Attempted to implement time of arrival technique in predicting distance via bluetooth and sound. As of yet is unsuccessful I did learn a lot about rotation matrices, and applying rotations through our gyroscope data Will continue researching ways of tracking phone orientation	5	25
Anthony House	Not a ton, just working on various things. Week slowed down due to exams and other projects	3	21
Ryan Quigley	Experimented with orientation measurements	5	20
Jose Lopez	Updating map img on website for server	3	15
Travis Harbaugh	Conceptual Diagram Project Plan Created Gantt charts Previous work/literature	15	42
Cory Johannes	Unity model of Durham work Project design work	4	13

Plans for Next Week:

- Ryan Quigley
    - Develop a demo for measuring distance when moving straight forward.
- Cory johannes
    - Continue in Unity to create map
    - Learn the algorithms

- Travis Harbaugh
    - Meet the client about the HoloLens
    - Get access to clients repo
    - Get access to Microsoft Azure backend
    - Determine meeting times to access the Microsoft HoloLen
- Anthony House
    - Working on learning smoothing algorithms for use in the prototype
- Jose Lopez
    - Learn more about particle filtering
- Ben Holmes
    - I will focus primarily on managing phone orientation, while Ryan works on calculating distance. This way when we combine our two methods, we will have a very basic Dead Reckoning system
    - We will also need a simple app template for continuing to build our project
    - Will experiment with OpenGL to visualize changes in the phone's orientation
    - Continue researching state of the art methods in radio waves, step detection, and orientation estimation.