

# SE 491-sdmay19-27

## Smartphone Tracking App for Microsoft HoloLens

### Week 10

3/31/19 - 4/21/19

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:

This week we merged all of our components together. The re-calibration service has been added to the Android application, along with the gyroscope to replace the compass. We also implemented websockets between the server and Android app. In addition, the front end implemented Dijkstra's algorithm to pull points away from out of bounds areas, and onto the walking path, while also adding extra functionality for storing data by user.

### Pending Issues:

Testing.

## Past Week accomplishments

- Travis Harbaugh
  - The layout of the building interior and exterior was not the correct spots on the map. To fix this I compared google maps with street map and I noticed that the lat and long at one position were very close within .0000018 of each other. I couldn't use google maps data because there are some very big difference between open street map and google maps. Since I am using mapbox SDK I had to use openstreetmap data.
  - After I found a reliable location I then recreated building architecture by create an 3D model of durham by getting measurements from the durham floor plan and create triangles to form planes to create the building walls and pillars of durham for frontend visualization in the hololens.
  - Worked on creating a test plan that would allow use to test the accuracy of tracking solution. I used the durham floor plan along with autocad to attain the correct dimensions of each zone in the durham building. The way it is going to work is we will have zones that just cover straight paths and turns. We will use mathematical formulas to find the distance of where the user is currently located to the absolute true path. Then compare the distance from that path and that will attain the application tracking accuracy.
  - Tested the multiple users feature that allows you to display multiple avatars on the hololens based on the userID.
  - Designed the poster and made implementation diagrams.
  - Made powerPoint for Final presentation
- Ben Homes
  - I merged all of my Bluetooth/Sound code with the master branch in git
  - Began testing different paths with re-calibration points
- Anthony House
  - Started creating examples of how we can stream data using sockets from the java clients
  - Set up the sockets for the server in anticipation for socket connections in the future
  - Started cleaning up the front-end code so I could understand it and transition to that effort
  - Created an Acknowledgement system for sockets
  - Converted the old system on the frontend of calculating appx pixels to exact pixels
  - Created a way to pull production data to the localhost
  - Added in an x, y scale for the front-end
  - Created Dijkstra's Algorithm to pull users out of restricted zones. Took 10 hours in itself just to implement this
  - Showed Jose where some improvements can be made for a faster working algorithm
- Ryan Quigley
- Jose Lopez
  - Can now display any user with data, not just Ryan
  - Can now display True paths dynamically after many trials and errors
  - Tried to implement improved algorithm for restricted zones
  - Tried to code an algorithm for automatically calculating error from true path

- Cory Johannes
  - Some work on zoning, till Anthony came out with Dijkstra work. Then added quick fix to help optimize

### Individual Contributions:

Team Member	Contribution	Weekly Hours	Total Hours
Ben Holmes	Merged all Bluetooth/Sound code with master. Testing.	12	64
Anthony House	Lot of stuff. Most notably Dijkstra's algorithm.	22	45
Ryan Quigley		0	44
Jose Lopez	Can display any user and true paths dynamically.	20	60
Travis Harbaugh	Tested the multiple users feature. create an 3D model of durham by creating meshes to from walls, pillars. Designed the poster and made implementation diagrams. Made powerPoint for Final presentation.	32	149
Cory Johannes	Added correction persistence to Dijkstra's algorithm.	2	14

## Plans for Next Week:

- Travis
  - Create a demo of the hololens for the final presentation.
  - Work on the final documentation.
  - Finish the final presentation powerpoint for the panel.
- Anthony House
  - Update the UI
  - Work to find bugs and get a better path drawn
  - Start working on Posters, ect
- Ben Holmes
  - Continue testing, and refining full solution as needed
- Cory Johannes
  - Documentation and project poster work
- Ryan Quigley
  - Testing
- Jose Lopez
  - Continue testing