

SE 491-sdmay19-27

Smartphone Tracking App for Microsoft HoloLens

Week 3

09/15/18 - 09/21/08

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:

- Added Proximity sensor to Android app. Now we have implemented (barometer, proximity, light, accelerometer, gyroscope, magnetometer, and orientation)
- Continued researching different sensors that can help us in accomplishing our goal of dead reckoning tracking technology
- Added ability to use and control sound through the Android app. We can now hear and identify frequencies in the range of 1000-20000 hz, this is the limit for most Android phones.
- Started working with way for collecting and storing data from the phones.

Pending Issues:

- TDOA distance measurements using sound and RF frequencies
- Step Detection using accelerometer
- Stride Length estimation
- Sound emitting speakers
- Sending bluetooth packets between phones

Past Week accomplishments

- Travis Harbaugh -
 - Implemented low-pass and high-filters to improve step detection on android application.
 - Calculate the distance a user has walked based on the accelerometer data collected.

- Researched indoor navigation techniques using phones sensors, camera.
 - Ben Homes
 - Lots of research on different tracking implementations, Dead Reckoning, Wifi, Bluetooth, Orientation estimation.
 - Android app can now recognize and emit frequencies using phone's speaker and microphone. It is a crude implementation, but it basically works.
 - Anthony House
 - Server set up to start receiving data from phones
 - Helped manage the team
 - Ryan Quigley
 - Research
 - Jose Lopez
 - Research about particle filter
 - Cory Johannes
 - Beginning work on drawings
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Individual Contributions:

Team Member	Contribution	Weekly Hours	Total Hours
Ben Holmes	Lots of research on different tracking implementations Implemented sound, for sonar or time dilation of arrival	3	20
Anthony House	Server setup for data consumption	4	18
Ryan Quigley	Reading research papers on experimental tracking methods	3	15
Jose Lopez	Research	3	12
Travis Harbaugh	Improved step detection on android/iOS application Researched indoor techniques using accelerometer, Gyroscope, and Proximity sensor Calculate the distance walked from the	5	27

	data collected from the Accelerometer on android/iOS		
Cory Johannes	Drawings, notes from meetings	3	9

Plans for Next Week:

- Travis Harbaugh
 - Connect with Andrew to work with the hololens in unity.
- Ben Holmes
 - Researching state of the art methods for accomplishing our task. We need a way to track people using the accelerometer, so I will look into what has already been done. We will probably start with the Dead Reckoning approach, and then later branch out into utilizing sound and radio waves for localization.
- Anthony House
 - Research methods for displaying an image on top of another image (web)
- Ryan Quigley
 - Check accelerometer for turn
- Jose Lopez
 - Create website with floor plan layout
 - Have basic algorithms for displacement
- Cory Johannes
 - Finish drawings
 - Familiarize self with research