sdmay18-34: Integration of personnel tracking in an Augmented reality environment

Week 5 Report
October 16 - October 22

Team Members

Logan Highland — *QA Lead*
Chandler Chockalingam — *Project Manager*
Christopher Stapler — *Report Manager*
Josua Gonzales-Neal — *Chief Engineer*
Jason Ramirez — *Software Architect*
Victor Da Silva — *Chief Engineer*

Summary of Progress this Report

This week we attempted to narrow down potential solutions for the personnel tracking portion of our project. The team focused on learning more about the implementation of SpotFi a paper that details localization based solely on Channel State Information that utilizes commodity WiFi cards. As the implementation details seemed complex at first look, this week also looked into open-source implementations of the algorithm to incorporate into our system. In addition, team members took up individual tasks that involved finding the correct hardware for gathering Channel State Information.

Pending Issues

One challenge that we might face fairly soon is hardware incompatibility issues. Channel State Information has only really been gathered using the Intel 5300 Wi-Fi NIC Chipset. This card needs a mini PCIe connection to run properly. Most laptops have a mini PCIe slot however they might not contain enough antennas for the algorithm to function properly.

Plans for Upcoming Reporting Period

At the end of the next reporting period, we plan to have demoed some localization using either Channel State Information or RSSI to both our advisor and client. We should have the Intel 5300 card placed inside two different laptops and should be able to test out the CSI tool using these laptops. Another goal is to compare our CSI output to table highlighted in a research paper shared with us from our advisor.

Individual Contributions

Team Member	Contribution	Weekly Hours	Total Hours
Logan Highland	Searched for open source software to help us collect the CSI information from the chip, as well as ways to use the information we gather.	5	28
Chandler Chockalingam	Read more papers on CSI. Looked into implementations of CSI and RSSI. Found an open-source implementation of the SpotFi algorithm written in MATLAB.	4	25

Christopher Stapler	Looked into how the CSI tool works for purposes of the project. Looked closely for information on what operating systems it will run successfully on. Researched its design and found out that it consists of two different parts, a modified driver for the intel card and also a closed-source firmware. Looked deeper into SpotFi and Chronos papers and discovered that for SpotFi to be implemented fully three antennas will be needed for both the receiving antenna and the transmitting antennas.	5	30
Josua Gonzales-Neal	Researched methods to connect the Raspberry Pi and a PCI-E connector for our Intel 5300 wireless chip. Gave a list to the client on supplies needed for the antenna array for the Intel 5300 chip.	4	27
Jason Ramirez	Searched for alternative boards for raspberry pi. Looking up CSI algorithms and reading papers for understanding. Got laptop from Daji and started taking apart.	4	26
Victor Da Silva	I read the research papers that we were given for the CSI tracking. I also got a computer with Linux running on it for future testing. Did research on how to implement CSI with our specific project.	5	25