

sdmay18-15: Building wireless lab space on a college campus

Week 6 Report

October 15 - October 26

Team MembersAlec Sauerbrei — *Curriculum Lead*Colin Ward — *Communications Manager*Hope Scheffert — *Git/Documentation Manager*Omar Taylor — *Software Design Lead*Tyler Much — *Physical Design Lead*Dalton Handel — *Network Design Lead***Summary of Progress this Report**

The team has made great strides in the prototyping and testing phases of the project during the span of this reporting period. Members of the team were able to sit down with Dr. Mani Mina and discuss the progress that we've been making on the cages. Dr. Mina suggested we try a prototype with aluminium foil, and to focus our research more on "electromagnetic signal blocking" rather than Faraday cages specifically, as more helpful information would surface.

The team organized a "Lab Jam" this past Tuesday to get together and push forward on the technical progress of the project. During the span of that afternoon, the team got the Ubuntu Server built to run OpenBTS, the current prototype was modified with additional metal mesh, and the Raspberry Pi 3 and its python scripts were tested inside the cage. While the test results with the RPi3 weren't as successful as the results done with cell phones, it has helped us to learn what we need to modify on the cage to block the appropriate signals.

Pending Issues

The team received word back from the client-advisors that the sourcing for the parts list wasn't the best. The team will be going back over the list to find new websites/stores that can provide the same components.

Plans for Upcoming Reporting Period

A second version of the Faraday cage is going to be made using aluminium foil and tested in the same way that the first was to see how it fairs. OpenBTS will also be functional on the SDR by the next reporting period.

Individual Contributions

| Team Member | Contribution | Weekly Hours | Total Hours |
|----------------|---|--------------|-------------|
| Alec Sauerbrei | Discussed curriculum and met with mani mina about possible options for better blockers for our faraday cage and worked with the group on faraday cage testing | 7 | 24.25 |
| Colin Ward | After getting my Raspberry Pi connected to the University network, I wrote a handful of python and shell scripts. These scripts are | 8 | 29 |

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| | used to ping specific devices and access websites automatically from the Pi. There are also scripts for remotely monitoring the signal strength of the Pi. These were then used on the Pi during testing in the prototype Faraday box. | | |
| Hope Scheffert | Worked a little on project plan version 2. Helped Tyler improve the prototype by lining it with wire mesh. Conducted several tests with improved prototype by placing phone and pi in box and calling/pinging. | 7 | 26 |
| Omar Taylor | Conducted further research into OpenBTS, namely I was able to discover that the SDR we currently have on hand (NI USRP-2920) is likely to be sufficient for us to host a cell network on with the OpenBTS software. This week, I have moved onto building the OpenBTS software onto the SDR to verify this revelation for myself. I have also begun documenting my results for reproduction purposes. | 5 | 18 |
| Tyler Much | Attended lab jam and redid the prototype for the faraday cage. I went to Ace Hardware to get some metal screens. Then our group cut and fit the mesh on the inside of the faraday cage. After extensive testing it seemed like the mesh helped blocking cell signal, but not wireless. This makes sense, because the mesh has holes. The holes make it so High Hertz signals would still be able to get through... | 8 | 24 |
| Dalton Handel | Building and configuring Ubuntu Server 16.04 LTS VM on VirtualBox to run OpenBTS. Discussion with Mani Mina over EM shielding (suggestions for different experiments). | 8 | 25.5 |