**Team: NoiseHub (Team #8)**

**Team Leader: Alex Prior**

**Next Team Leader: Allen Zou**

**Goals:**

* Hardware implementation
  + Dual LIDAR array
  + Microphone
* Refine mobile application home screen
* Reconfigure Timestream database structure
* Formal PDR
* Video demo

**Roles:**

* Benjamin Brewer - Hardware Engineer
  + Dual LIDAR array
  + Raspberry Pi + Sensor hardware configuration
  + Formal PDR
  + Video demo
* Ibrahim Chand - Full Stack Developer
  + Mobile application home screen
  + Mobile application color scheme + logo redesign
  + Timestream reconfiguration research
  + Formal PDR
  + Video demo
* Alex Prior - Sensor Scripting and Full Stack Developer
  + Microphone research and application
  + Timestream reconfiguration research
  + Formal PDR
  + Video demo
* Allen Zou - Hardware Engineer
  + Dual LIDAR array
  + Raspberry Pi + Sensor hardware configuration
  + Formal PDR
  + Video demo

**Progress:**

With everyone heading home early for thanksgiving break and the bulk of the work remaining involving hardware, our team worked hard in the weeks before the end of the semester to hit a reasonable stopping point in order to divide up research and responsibilities for when we came back from winter break.

Before break started, we ordered our second LIDAR sensor that would be used in our “dual LIDAR array” as well as another “plug and play” USB microphone. We chose a USB microphone as it did not require any drivers, making it a quick solution to integrate with our Raspberry Pi. While we waited for our new parts to arrive, we continued refining our mobile application UI/UX and brainstormed how we will sanitize and draw conclusions from our data once we have more sensor data streaming to AWS.

We started a redesign of the home screen that included a new color scheme and layout for displaying and visualizing data on each study space. Prior to winter break, the design still had a ways to go, but we got the ball rolling while we worked on our final PDR and demo video.

Once we returned from winter break, we fully tested our new hardware. The USB microphone posed several unforeseen problems, but ultimately worked. Splitting the Raspberry Pi’s single I2C connection to both LIDARs also posed a challenge, but Allen and Ben were successful after a few days of testing.

By the end of my cycle as team lead, I was able to prototype modeling a state system for noise level based on current and peak volume, both LIDARs were streaming continuous data to the Pi, and the mobile application was redesigned for our data visualization.

**Issues:**

Our biggest issues during my time as team lead stemmed from splicing the Raspberry Pi’s single I2C connection across two LIDAR sensors, and the microphone configuration. Allen and Ben split up to tackle the I2C connection, I was troubleshooting the microphone, and Ibrahim was redesigning the mobile application.

Allen and Ben tried daisy chaining the LIDAR sensors, but kept running into issues. After doing some digging, they found that many people online recommend against daisy chaining for I2C connections, and found a way to splice the connection instead. After dealing with some issues involving the pull-up resistor, they were able to get both sensors working.

My time troubleshooting the microphone stemmed from the lack of technical specifications on the microphone’s product page. Adafruit did not publish any specs such as the microphone’s supported frequencies or channels, which were required parameters for configuring the audio streaming scripts I needed to write in Python.

**Progressive Measurement Methodology:**

We continued using the Trello board set up months ago, which proved extremely helpful for staying on track and organizing our data when troubleshooting or planning. As tasks were completed, we continued to move them across our “Kanban” style board, as well as updating our Gantt chart.

**Work for Next Period:**

* Create LIDAR tripwire algorithm
* Finalize room volume state system
* Finalize Raspberry Pi housing with sensors
* Visualize data on mobile application

**Personal Assessment:**

Our team communicated clearly and effectively, easily dividing up work and agreeing on a list of priorities at every meeting. As we continue to dive deeper into both the software and hardware aspects of our project, everyone is ready and willing to divide up work according to each person’s strengths and weaknesses, and everyone helps each other out when troubleshooting or bouncing ideas off.