Sound Traffic Sensing

Group 111-4

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Traffic Sensor

What does it do?

Helps users find places on campus with the least amount of foot traffic.

Description

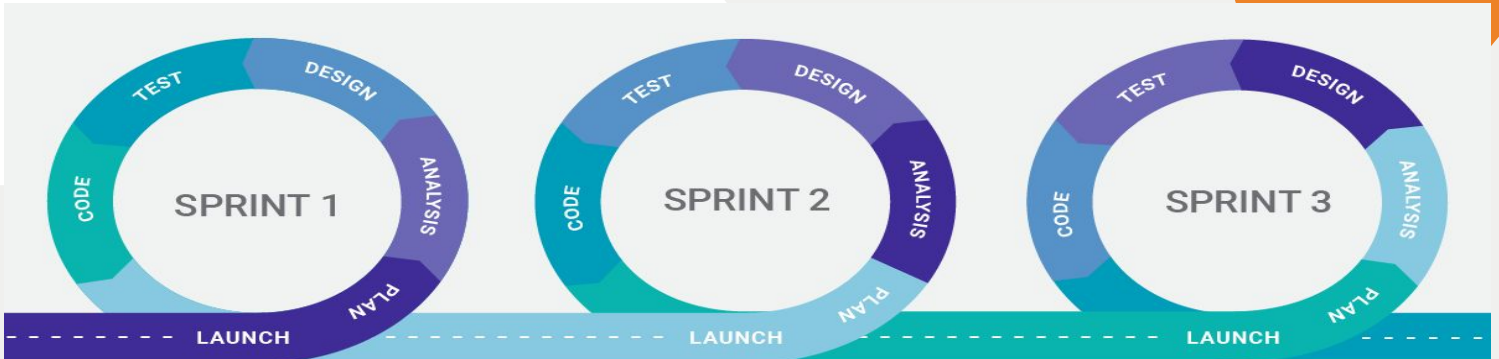
App takes live decibel data from device and analyzes past data to determine whether a location is busy, normal or quiet.

Purpose

Eliminating the need to physically go to locations to see if there's open seating.

Methodology

- Our team used Agile/ Scrum Methodology
  - Rating: ☆☆☆☆☆ (5/5 stars) because of organization of roles and efficiency of task completion
  - Purpose: Used Agile to increase project control throughout development. Agile also helps improve efficiency and make sure tasks are being completed in a timely manner.



Tools Used

Throughout the development process

Software

- Trello
- Slack
- GitHub
- Node
- Pug
- Postgresql
- dB sensor app

Hardware

- Raspberry Pi

Project Management and Communication

- Management Tools:
  - Trello Rating ☆☆☆☆ (4/5 stars)
    - Easy to use. Some of the features unnecessary for our use.
- Communication Tools:
  - Slack.com Rating ☆☆☆ (3/5 stars)
    - Nice features but accessing on computer was a bit more of a challenge and harder to get a hold of people as quickly

VCS

- Version Control Tool: Github
  - Milestone Repo
  - Meeting Log Repo
  - Code Repo
  - Rating ☆☆☆☆☆ 5/5 stars)
    - Easy to use and seamless across all devices. Had a good interface and easy for multiple people to use.

Tool Rating and Details - Node

Framework

Rank: ☆☆☆☆☆ (5/5 stars)

- Easy tool to communicate between front end and database

Tool Rating and Details - Pug

Template Engine

Rank: ☆☆☆☆ 4/5 stars

- Easy to make HTML dynamic
- Interpolation in script tags can be difficult

Tool Rating and Details - Postgresql

Database

Rank: ☆☆☆☆ 4/5 stars

- Easy to navigate
- Plenty of help from labs
- Need 3rd party app for GUI

Backend

- Tool Used for Backend: **Swift Simulator**
  Rating: ☆☆☆☆ (4/5 stars)
  Purpose: To test UI elements and button functionality and if the app was actually making post requests.

Testing

Xcode/Swift

Rating: ☆☆☆ (3/5 stars)

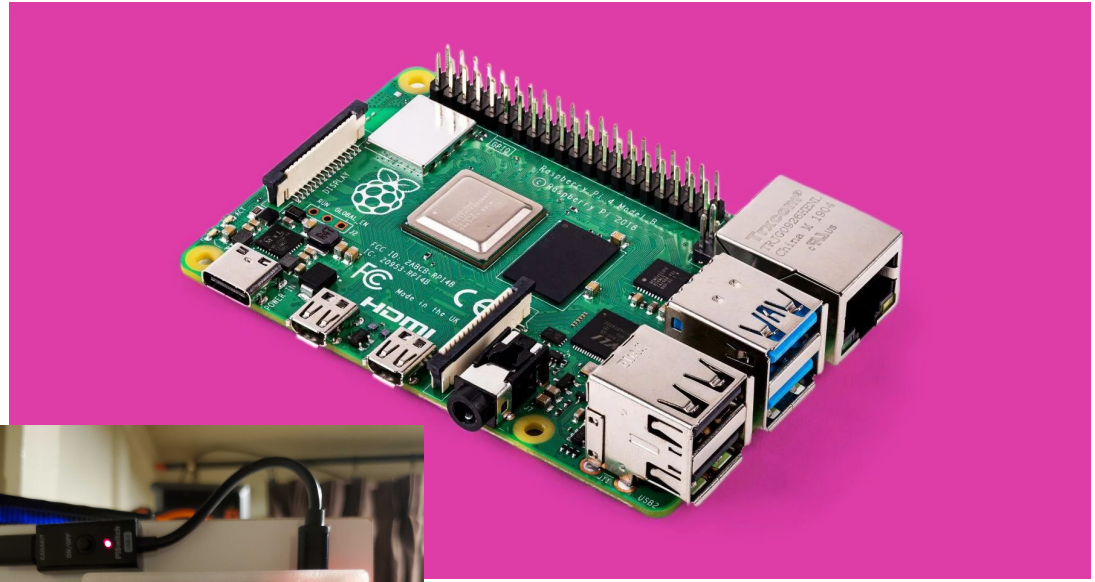
Challenges with integration with webapp due to apple's limitations on what it allows to post to.

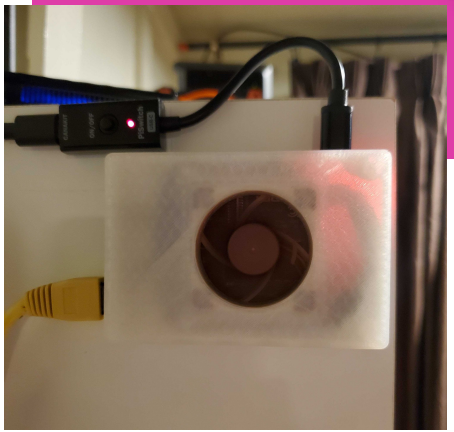
Raspberry Pi 4

Server

Rank: 5

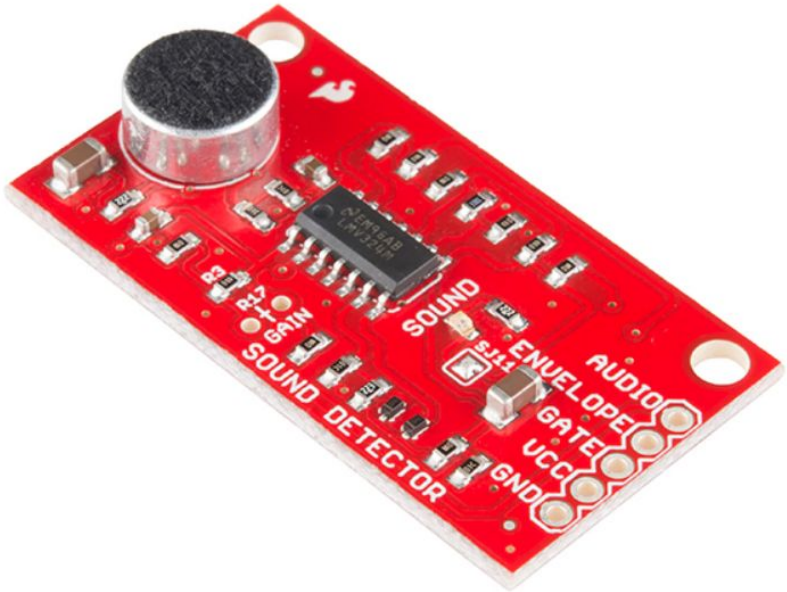
- Easy to connect to
- Inexpensive and Linux based





dB Sensing

- Sensor has to be paired with the Raspberry pi.
  - Because of this we went ahead and replaced it with a mobile application on our smartphones.
  - This is a cheaper and more realistic way to implement the dB sensing.
  - Mobile sensor is much more accurate.



Challenges

- Cannot host a server at CU without permission from IT.
- Integration between sub units.
- Communication due to school scheduling (Hard for everyone to find a time to meet).
- Sensor unit is not very accurate.
- Sensor Unit cannot be used when RPI is acting as a server.

How did we overcome these challenges?