Team Members

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Problem Statement

- In environments with dynamic noise levels, frequent volume adjustments for Speakers and TVs are a nuisance.

- Our system will be an intermediary device that regulates the volume of audio devices based on levels of ambient noise in a room.
Specifications

- System will have a full range of sensitivities for volume adjustment (1-5)
- System will adjust volume steadily
- System will have a simple user interface via an iOS app
- System will function within 15 ft radius of microphone
Our Solution: Block Diagram
Sensitivity and Threshold

- Sensitivity set by changing reaction time
  - Range of 1 to 5
  - 5 adjusts volume after 0 seconds of mic input greater than expected
  - 1 adjusts volume after 8 seconds of mic input greater than expected
- Threshold set at a constant 2
FSM
iOS Application: User Interface

- Walks user through setting up a device in an effortless fashion
- iOS app user flow - 5 stages:
  - Welcome Page
  - Device Discovery
  - Calibration
    - Added load calibration capability
  - User Settings
    - Now just sensitivity setting
  - Run Stage
    - Added start/stop capability
Enclosure

- Designed in Autodesk Fusion 360, to be 3d printed in M5

Top View:  
Bottom View:
Cost

- Raspberry Pi: $35
- PCB: $26 (3.19x1.66) or (5.3 sq inches)
- Cables (USB/AUX): $10
- SD Card: $7
- Enclosure: ~$15
- Microphone: $75

- Total: $168
DEMO
Questions?