Final Presentation

Team Melon: Wind Sensor

Overview

- Final Status
- Block Diagram
- Power Budget
- Wind Tunnel Design
- Problems
- Pseudocode
- Gantt Chart
- Future Work
- Closing

Acknowledgement

S/O to the past members of the Wind Sensor Team:

Scott Nishihara

Jerry Wu

Block Diagram | Acoustic Sensor

Microphone (North)

Microphone (South)

Microphone (East)

Microphone (West)

Microprocessor (Teensy 1.2)

Data Out To WeatherBox

Power Budget

Current Draw: 24 µA

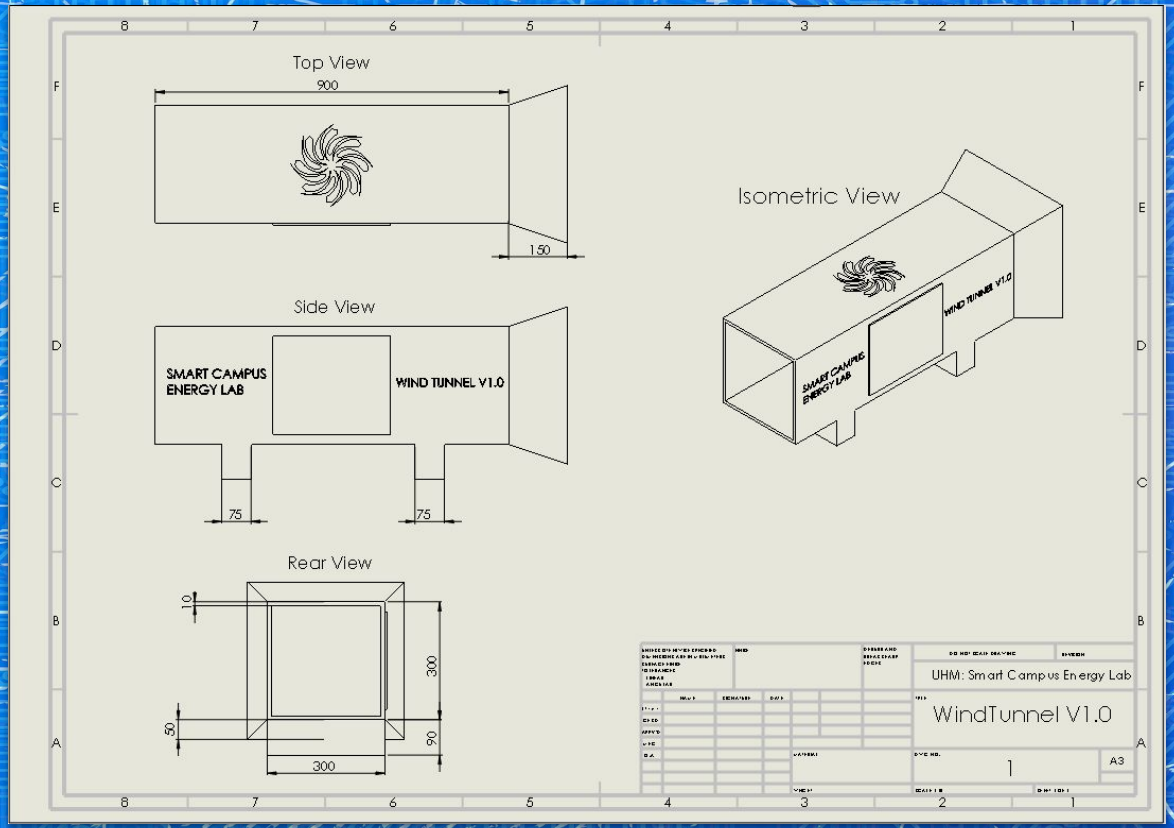
Voltage Supplied: 3.3 V

Power per Microphone: 79.2 µW

Total Estimated Power: 316.8 µW

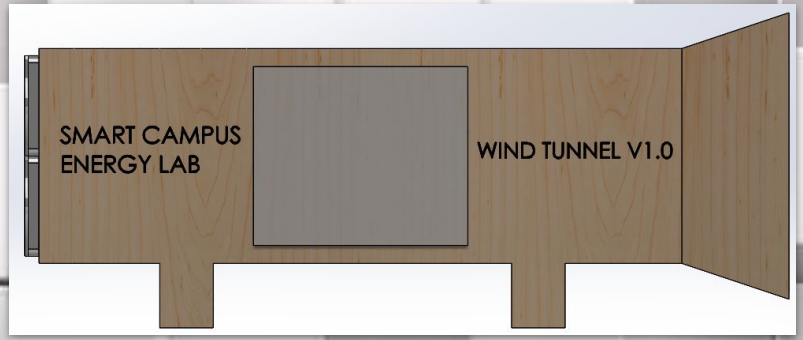
MAX4466 Datasheet:
http://pdf1.alldatasheet.com/datasheet-pdf/view/73367/MAXIM/MAX4466.html

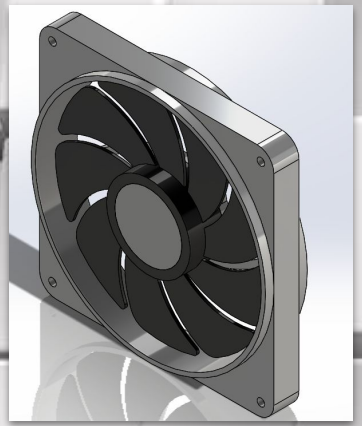
Technical Drawing | Wind Tunnel

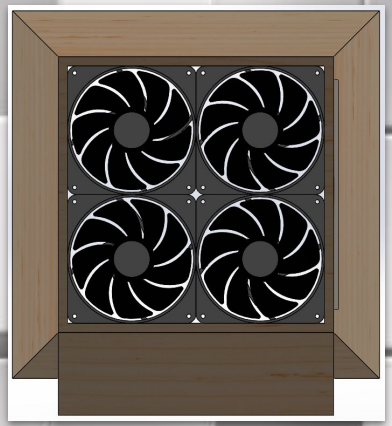


- All dimensions are in mm unless otherwise stated
- Materials:
  - Body - Cardboard
  - Window - Plexiglass
  - Stands - Wood

3D Rendering | Wind Tunnel Assembly







Pseudo-code

Testing Purposes

Receive analog data from microphone

Calculate peak to peak values

Convert to Volts

Repeat 100 times

Take average

Future Deployment

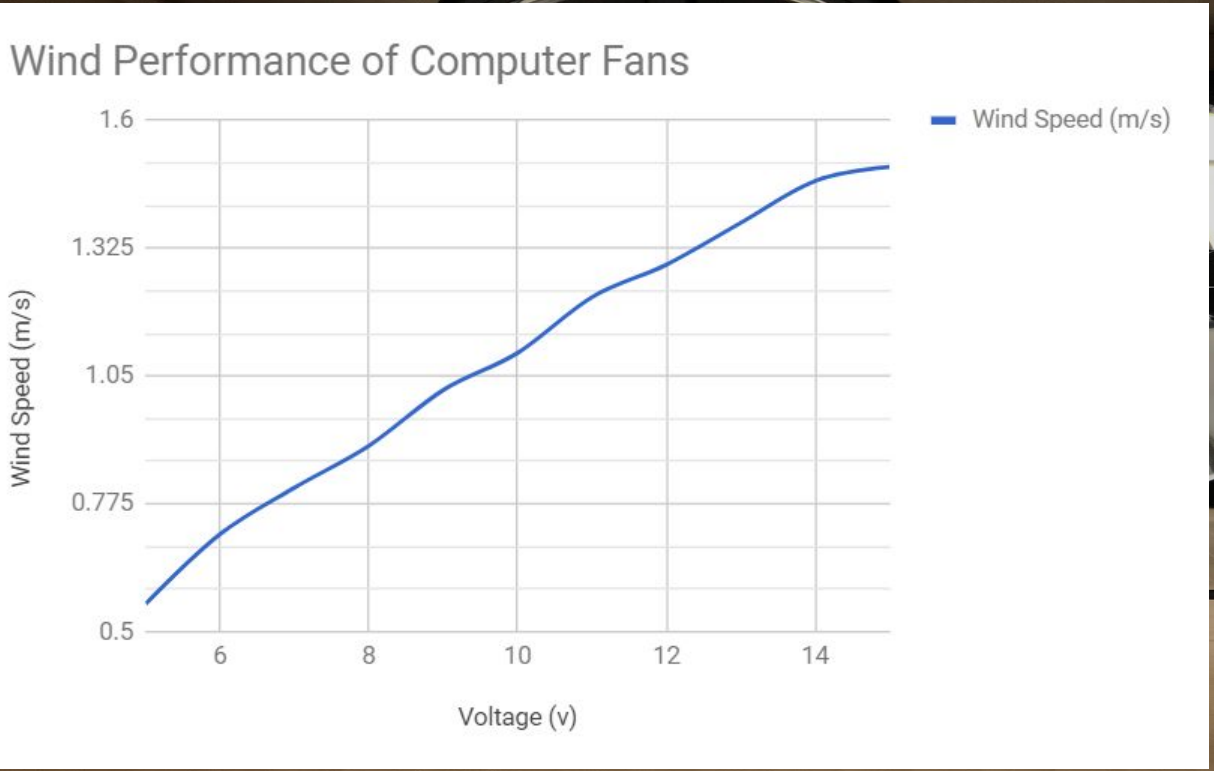
Same as testing setup, but with 4 microphones

Check differences in values between all 4 mics

If values are within certain distance of each other, treat wind speeds as vectors

Take vector sum of both mics to obtain “real” magnitude and direction

Data


Wind Performance of Computer Fans
Wind Speed (m/s)
1.6
1.325
1.05
0.775
0.5
Wind Speed (m/s)
6
8
10
12
14
Voltage (v)

Problems

Couldn’t get the correct amount of readings from Teensy at first

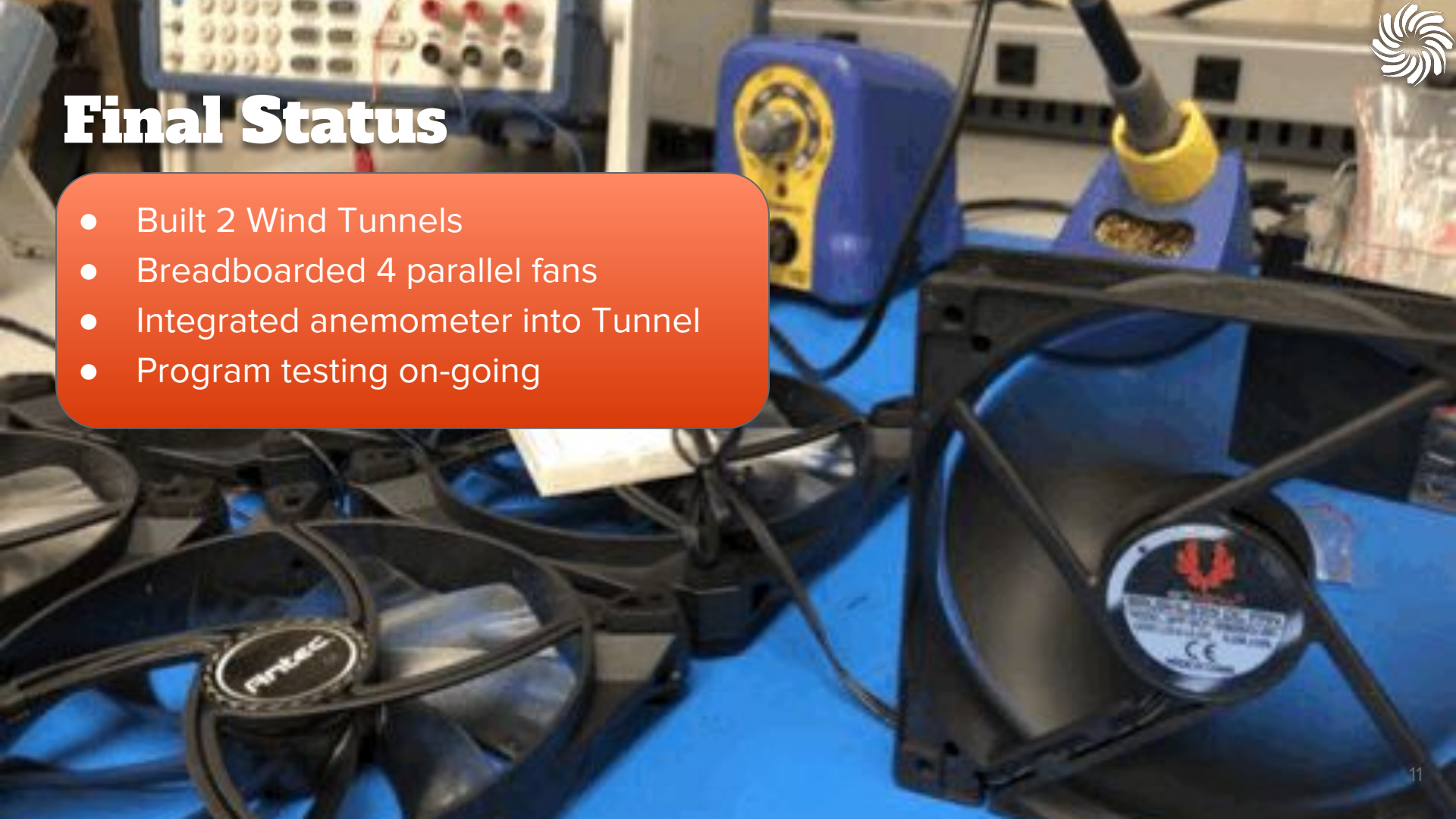
Programming and data errors

Connectivity (USB and Teensy software)

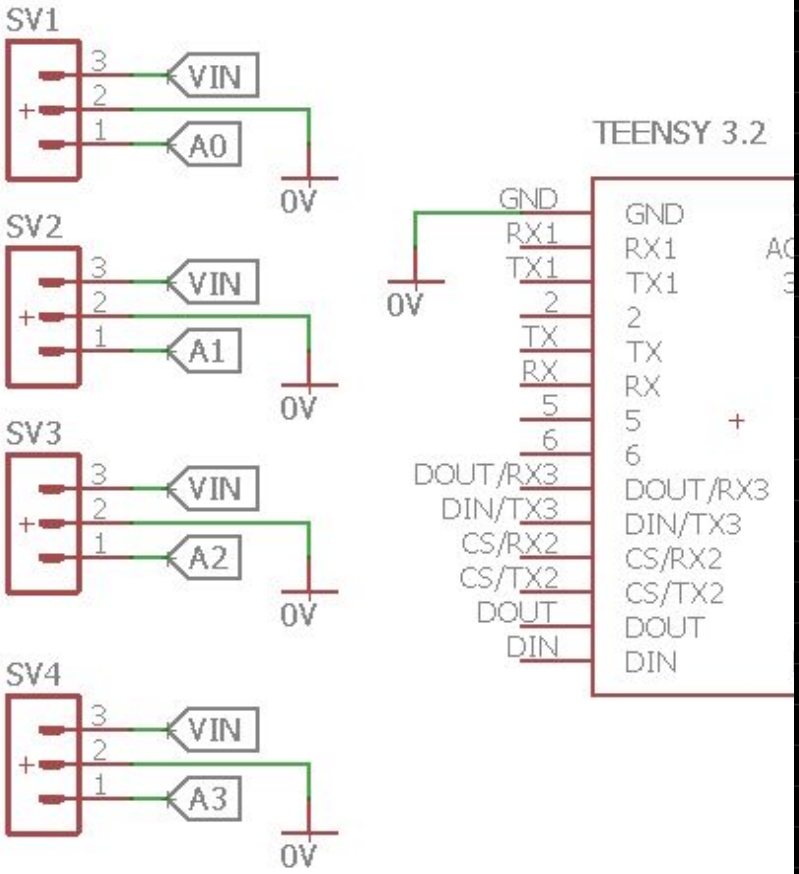
Background noise

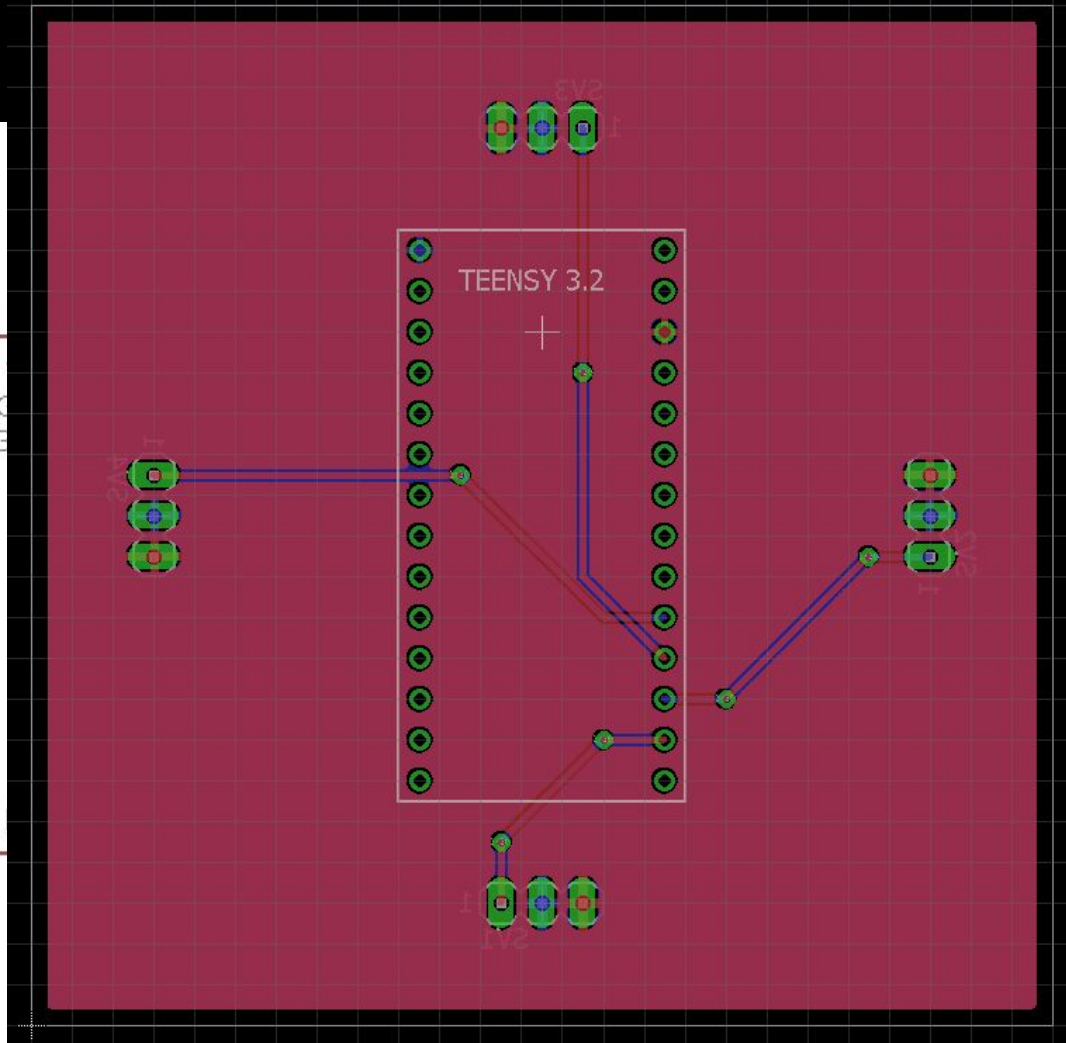
Final Status

- Built 2 Wind Tunnels
- Breadboarded 4 parallel fans
- Integrated anemometer into Tunnel
- Program testing on-going

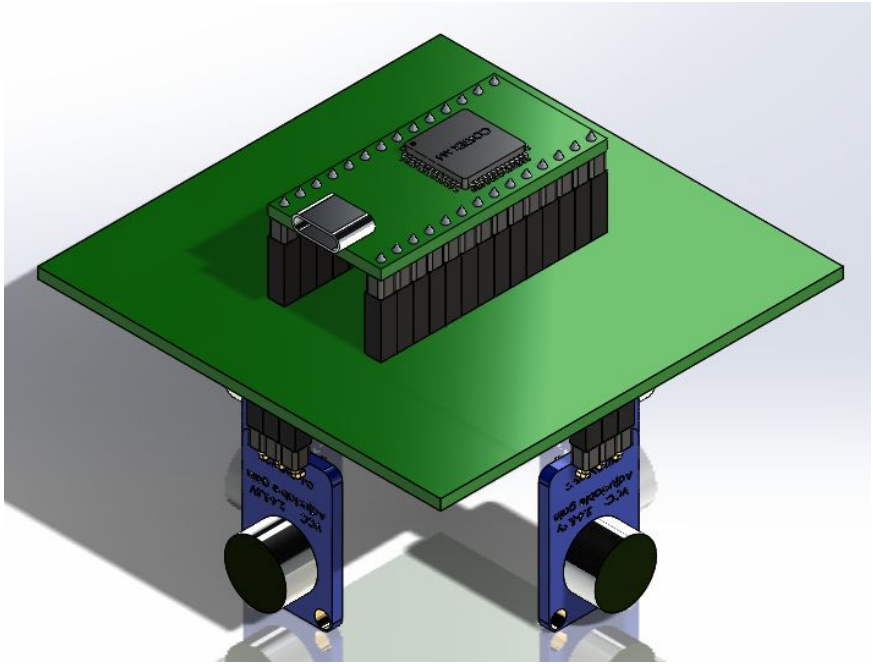


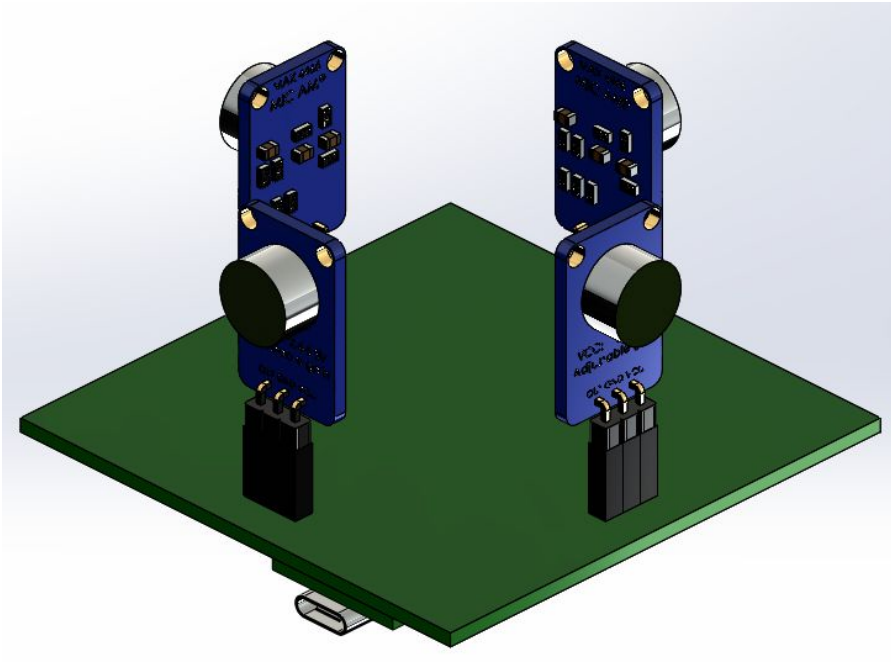
Eagle Files


SV1
3
2
1
VIN
A0
0V
SV2
VIN
A1
0V
SV3
VIN
A2
0V
SV4
VIN
A3
0V
TEENSY 3.2
GND
RX1
TX1
2
TX
RX
5
6
DOUT/RX3
DIN/TX3
CS/RX2
CS/TX2
DOUT
DIN
0V


TEENSY 3.2

PCB Rendering





Gantt Chart

Team Melon Joseph, Josh, Mark		January			February				March					April						May
Week		Week 1	Week 2	Week 3	3	Week 4	Week 5	Week 6	24	Week 7	Week 8	Week 9	Week 10	24	Week 11	Week 12	Week 13	Week 14	Week 15	28	Week 16
	CDR													x							
	Final																			x	
Research	Acoustic																				
	Ultrasound																				
Testing	Acoustic																				
EAGLE	Schematic																				
	PCB Layout																				
Debugging																					
Wind Tunnel																					
Ron Ho Fund																					
Housing																					
Final Paper																					

Future Work

Discontinue the acoustic sensors

Explore the ultrasound sensors

Make minor improvements with the wind tunnel

Print a PCB


Questions?