

Wind Sensor

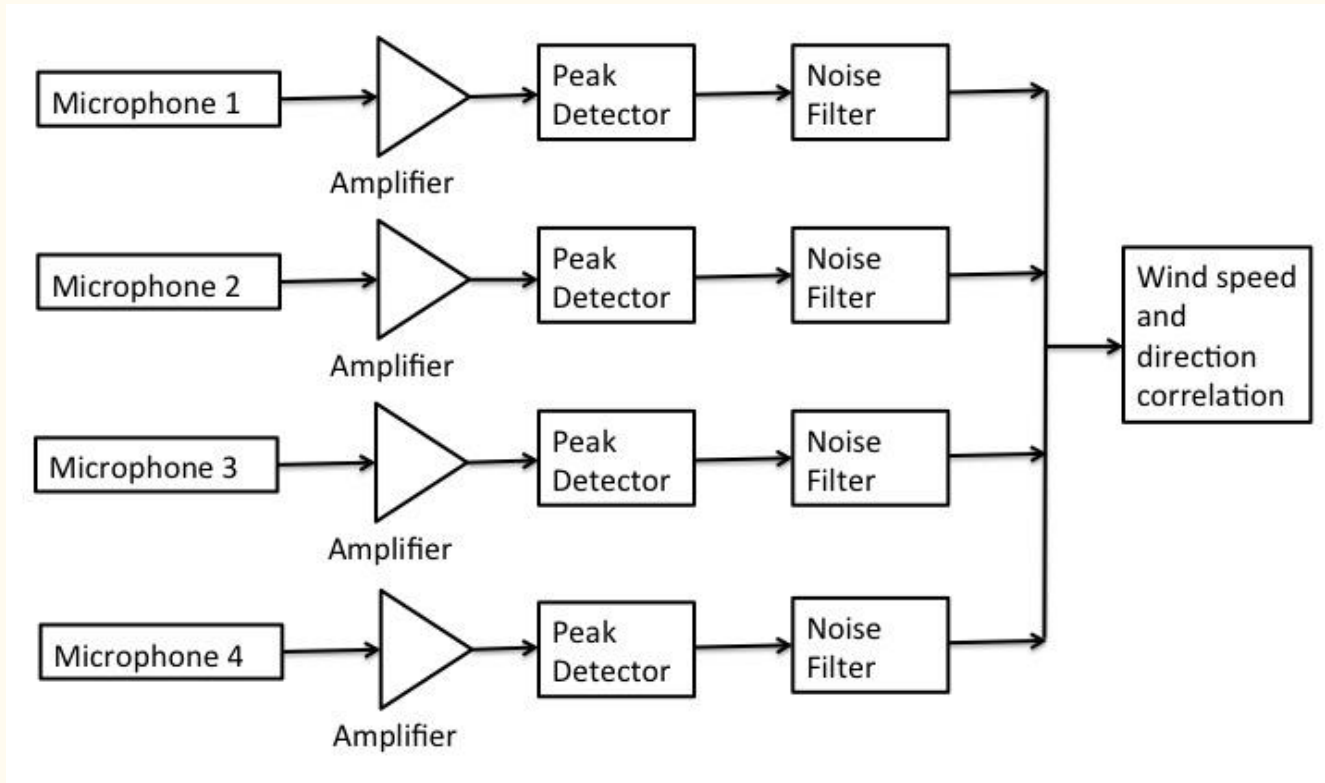
Critical Design Review

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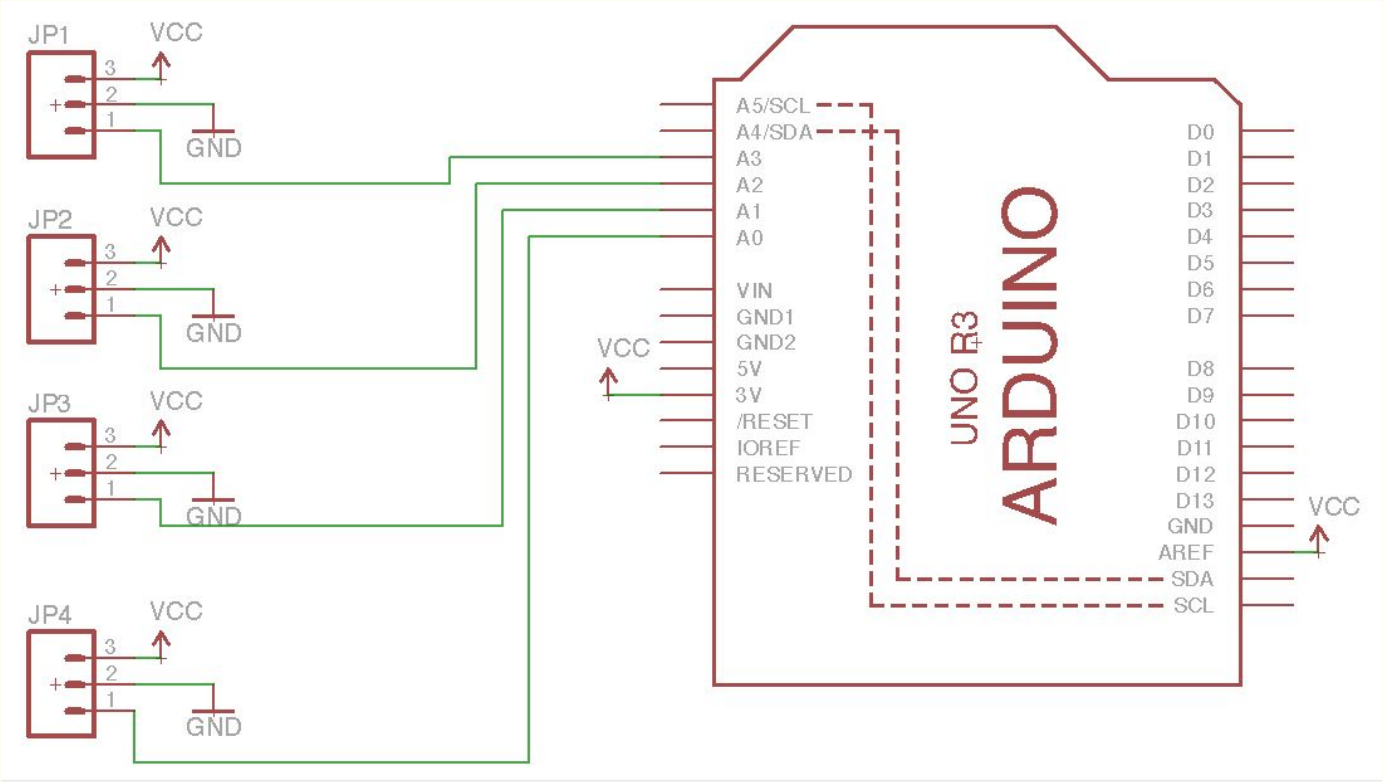
Overview

- Block Diagram
- Schematic
- Code
- Progress Since PDR
- Sample Data and Results
- What We Still Need to Finish

Block Diagram



Schematic



Code

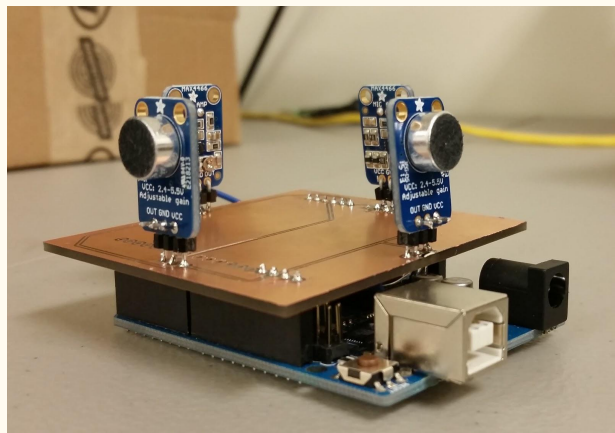
```
G = [ones(1,numel(Dat));Dat;asin(Dat);acos(Dat);asin(Dat).*acos(Dat)];  
b = regress(Sp',G')
```

```
L = X-ones(length(X),1)*mean(X);  
frq=(0:size(L)-1)/size(L)*fs-fs/2;  
Y = fft(L);  
plot(fftshift(abs(Y)));
```

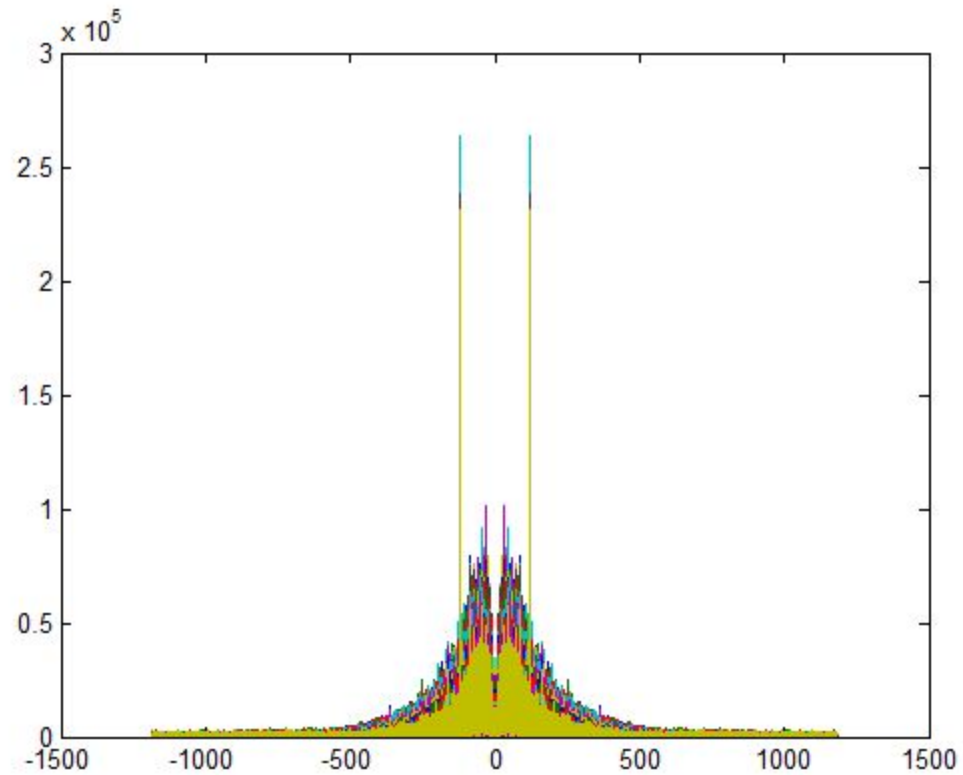
```
Xhat = ifft(LP);  
speed = mean(abs(Xhat-ones(length(Xhat),1)*mean(Xhat)));  
figure(6);  
scatter(S,[speed(end) speed(1:end-1)]);  
figure(7);  
plot(abs(Xhat))
```

Progress since PDR

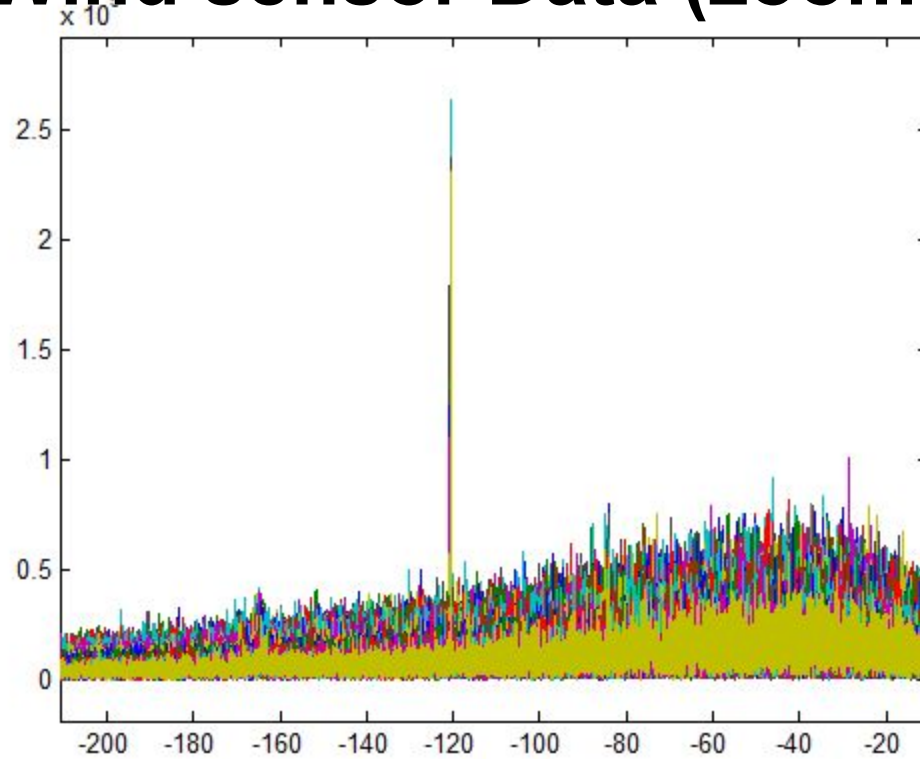
- Finished unit angle testing
- Looked at frequency correlations
- Redesigned the peak detector code
- Designed and soldered a PCB to be used for testing four directions



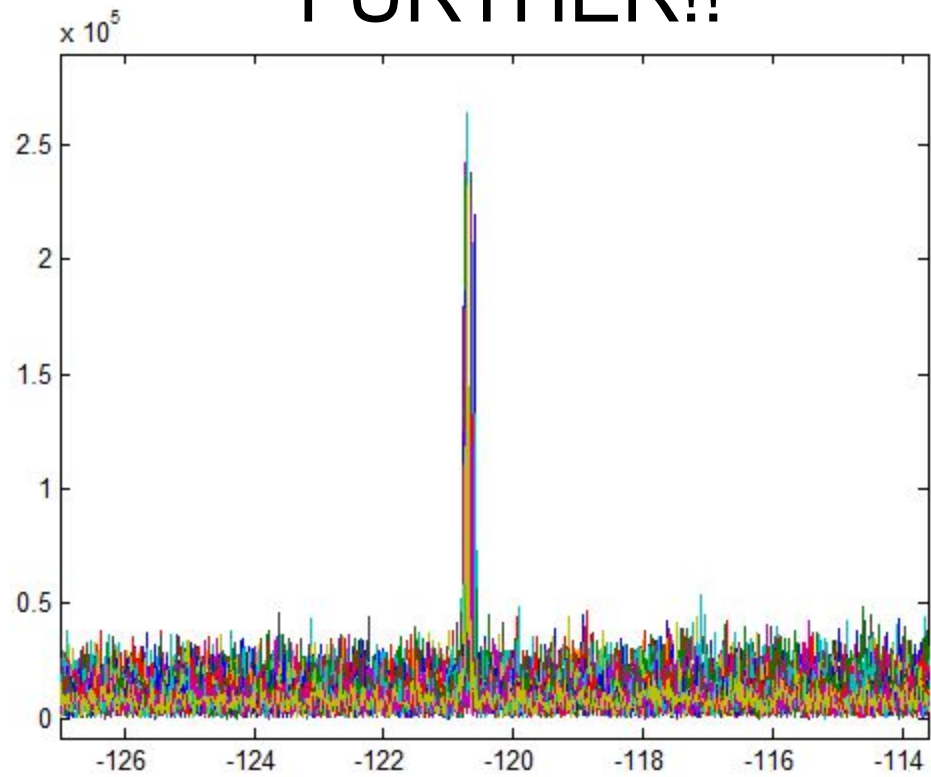
Wind sensor Data



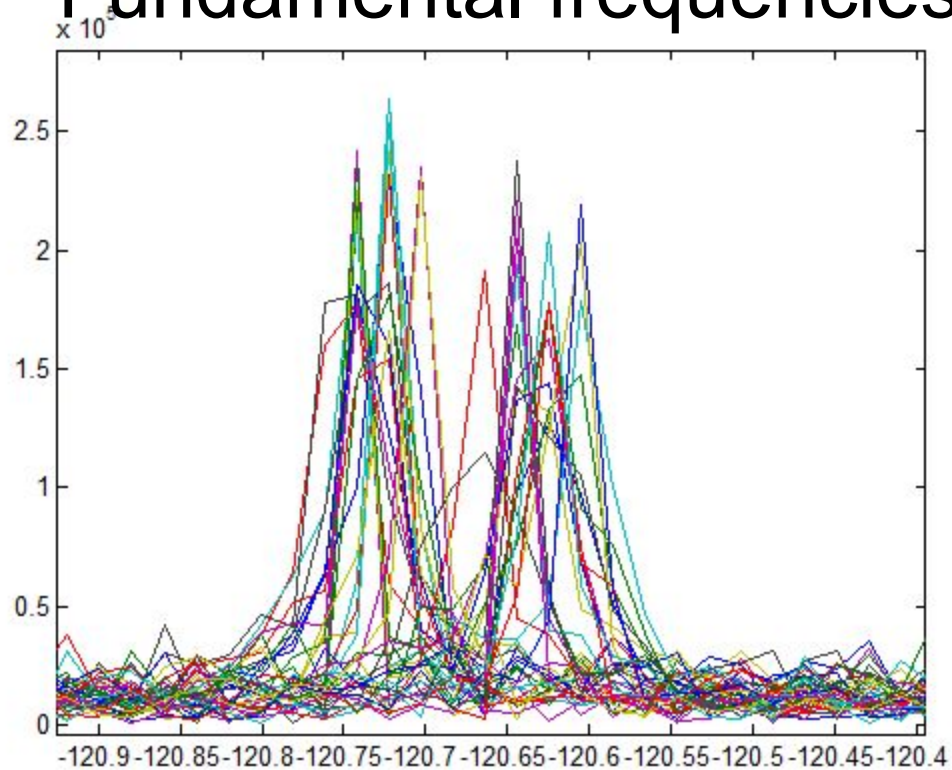
Wind sensor Data (zoomed)



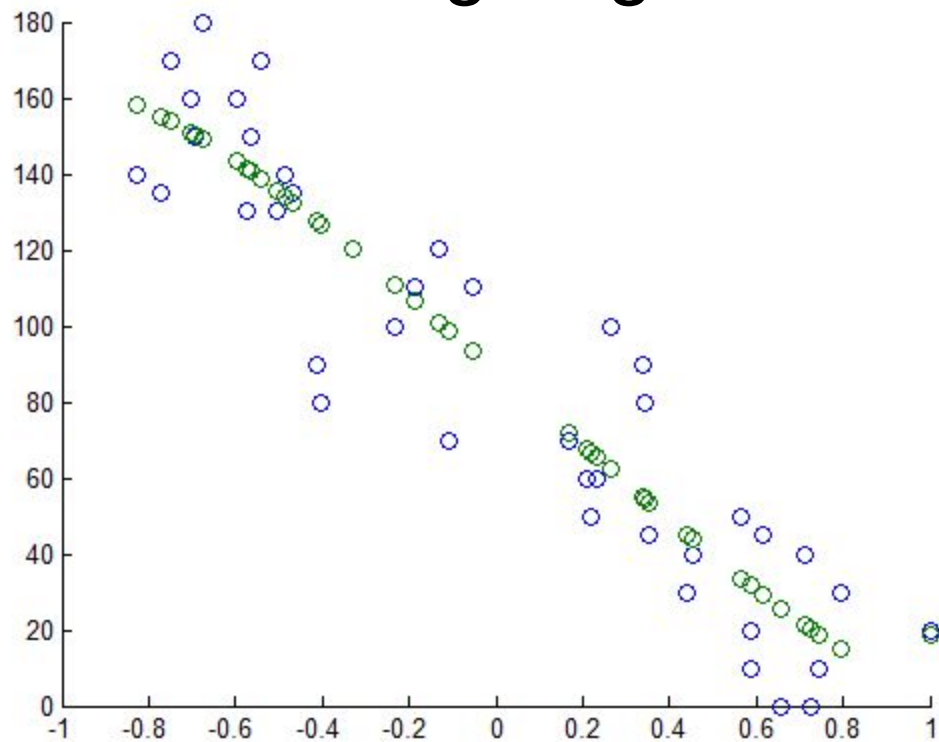
FURTHER!!



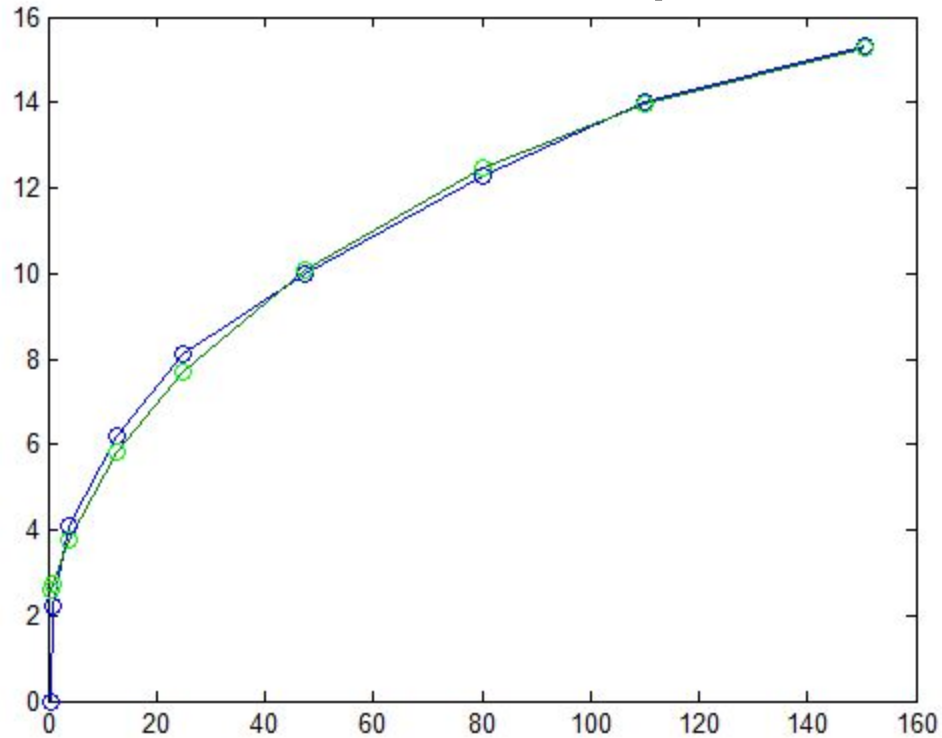
Fundamental frequencies



Fitting Angles



Fitted Wind Speed



What We Still Need to Finish

- Write Arduino Code for sampling four microphones
- Convert MATLAB Code to Arduino Code for amplitude and angle correlation
- Test our design
- Test our new fans
- Goal is to have a prototype by the next all hands meeting

Questions?