Continuous Monitoring of Asthma Control
Progress Report 8

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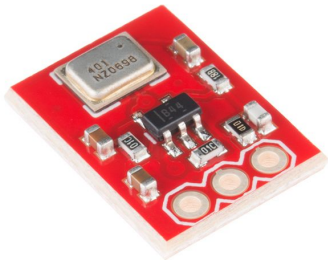
Date: Friday, March 10th - Thursday, March 16th

Problem Statement
Asthma patients often do not experience the the symptoms of asthma exacerbations, such as coughing, wheezing, and increased respiratory rate, for up to 2 days after it has begun. In severe asthma patients, where the exacerbations are more frequent, prolonged detection can lead to more serious symptoms, longer recovery times, and extended tissues destruction. These severe asthma patients only account for 10% of all asthmatics, but they account for a disproportionate amount of health-care costs, hospital admissions, doctor visits, and emergency services. By creating a device that can detect the symptoms of an asthma exacerbation earlier, the patients could be notified to start their asthma action plan (AAP) sooner. This could potentially save significant amounts of time, money and resources while reducing the effects of the exacerbation.

Restatement of Previous Team Goals
- Work on LabVIEW code to add data storage
- Begin fabrication on the device once supplies are delivered
- Brainstorm how to integrate the device into a shirt/band of some sort

Summary of Team Role Accomplishments
- Luke (BSAC) - Attended biweekly BSAC meeting
- Tim (Leader/ Communicator)- Worked on/ submitted the progress report. Submitted another request for the HIPAA training.
- Kelsey (BWIG/ BPAG)- Fixed SolidWorks design. Reordered cable. Uploaded progress report to website.

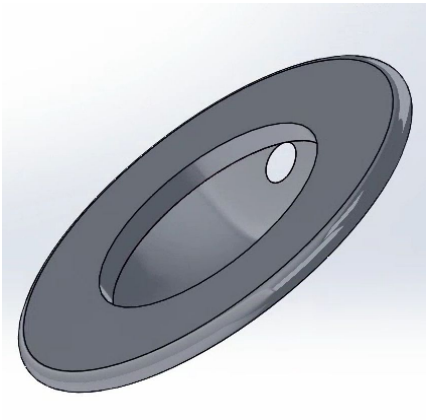
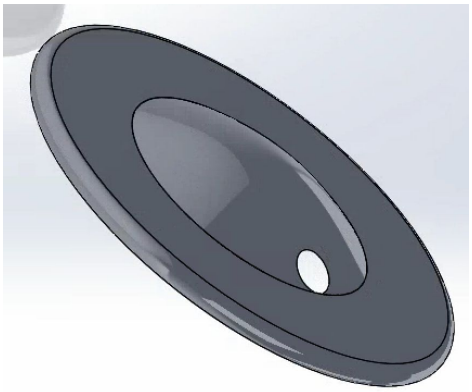
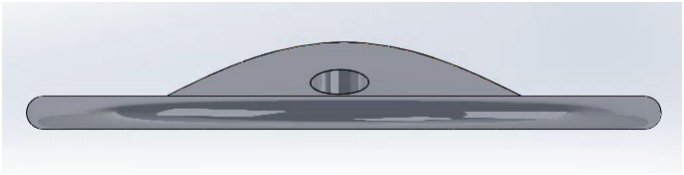
Summary of Design Accomplishments
The team decided on an encased microphone design. First, it will feature a 3D printed casing in order to make the design slimmer/more ergonomic. In addition, the microphone be completely enclose in the new casing. The reduced bulk will increase patient comfort and enable the device to be more easily integrated into a shirt. The team will use the same microphone as last semester: Sparkfun MEMS Microphone Breakout- INMP401 (ADMP401). The idea behind this is that we know that microphone has



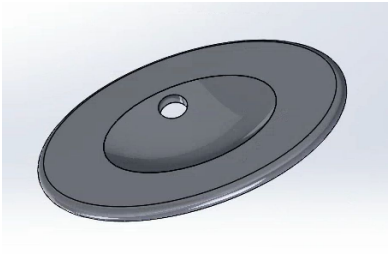
worked well and it should be compatible with our code written last semester.

Our team measured the previous semesters microphone design to get a better idea of the size we should make our design. With these measurements, solidworks designs were created.

Old solidworks images:

New solidworks images:




No new design changes have been made in the past week. The two conductor shielded cable with drain wire (Digi-Key C2534-50-ND) has shipped, but the team just received word that that casing has been printed. The team now has all the parts required to begin assembling the prototype. We intend to build the device and begin testing as soon as we get back from break.

Activities

Date	Member	Task	Time (hrs)	Week Total	Sem Total
3/15	Tim	Worked on progress report	.5		
3/16	Tim	Finished/ submitted progress report	.5	1	19.5
3/15	Kelsey	Reordered cable and fixed dome thickness on 3D printed piece	0.5	0.5	21
3/16	Luke	Progress Report	.5	.5	18

Statement of Team Goals

- Work on LabVIEW code to add data storage
- Assemble the prototype and begin testing
- Look more into the requirements for the shirt/ alternatives for holding the microphones

Individual Goals

- Luke: Begin fabrication of the device once we have supplies
- Tim: Complete the online HIPAA training. Work on LabVIEW code and begin fabrication.
- Kelsey: Pick up the 3D printed microphone casing and begin assembling the prototype.

Difficulties

One potential difficulty might be getting the DAQ software to work with the version of LabVIEW on the laptop for testing. We had issues with the LabVIEW on the instrumentation computers being too old and incompatible last semester, so we might run into similar issues again. Another potential issue could arise with adding more inputs into the DAQ. Although the DAQ is able to handle many inputs, we will have to figure out how to import the different signals into the LabVIEW program.

Project Schedule/Timeline

Task	Jan		February				March					April			
	20	27	3	10	17	24	3	10	17	24	31	7	14	21	28
Deliverables															
Progress Report	X	X	X	X		X	X	X							
PDS			X												
Preliminary					X										

Presentation					X										
Preliminary Report/Notebooks					X										
Final Presentation															
Final Report/Notebook/Evals															
Team Goals															
Select 3 final design ideas				X											
Design Matrix				X											
Presentation Powerpoint					X										
Decide on final design						X									
Presentation poster															
Meetings															
Team	X		X	X	X	X									
Advisor	X	X	X	X	X	X	X								
Client	X					X									
Website															
Update info	X	X	X	X	X	X	X	X							

Expenses

Date	Item	Cost
3/8/17	Digi-Key 2 conductor Shielded Cables with drain wire (C2534-50-ND)	$41.64
3/16/17	Microphone casing	$3.56