EE/CprE/SE 492 WEEKLY REPORT 6

3/30/2021 - 4/12/2021

Group 3

Smart Digital Stethoscope

Dr. Khokhar

Team:

- *Erik Becker: Chief Hardware Engineer*
- *Joseph Dobosenski: Scribe*
- *Margaret Heaslip: Report Manager*
- *Andrew Holman: Chief Software Engineer*
- *Megan Kasabian: Meeting Facilitator*
- *Jordan Spidle: Test Engineer*

Weekly Summary:

This week we continued development on the individual components of the project. For the software we continued to improve the UI of the website and work on the machine learning classifiers. We finalized the heart beat classifier and continued work on the respiratory algorithm. We also started implementing the algorithm in the website itself so it can be used to classify real recordings. The ADC code was reworked to be much more configurable. We will need to redo testing with the new code but the results should be more in line with what's expected. For hardware, the final microphone was tested for functionality. Research was done into techniques for fitting the microphones into a chest piece for accurate noise collection. This noise can then be removed.

Past Week Accomplishments:

- Erik Becker:
    - Continued testing the microphones. Tested the MEMS microphone for functionality
- Joe Dobosenski
    - Refined ADC code to modularize it more so we can quickly swap between modes of operation, sampling frequency, etc
    - Researched potential solutions for Bluetooth issues I have been having but did not have much luck
- Margaret Heaslip:
    - General modifications to the website
    - Add medical history panel
    - Look into how to add images to the website
- Andrew Holman:
    - Create final version of heart beat classification algorithm
    - Continue working on resolving issues with respiratory classifier.

- ○ Research implementing the algorithm into the website.
- ● Megan Kasabian:
  - ○ Performed tests with new microphones with the hardware team.
- ● Jordan Spidle:
  - ○ Purchased new stethoscope to finish design

Pending issues

- ● Explore wired alternative to Bluetooth

Individual contributions

NAME	Hours this week	HOURS cumulative
Andrew Holman	5	44
Megan Kasabian	5	17
Erik Becker	2	23
Jordan Spidle	6	16
Maggie Heaslip	5	25
Joe Dobosenski	12	45

Plans for the upcoming week

- Erik Becker:
  - Continue integrating the microphone into the chest piece
  - Continue testing the ADC with the microphone and filters
- Joe Dobosenski:
  - Improve data logging for ADC so that we can more readily extract results of conversion for analysis
  - Explore wired options to get a better sense of what is needed to have our device register as a microphone
- Margaret Heaslip:
  - Get a specific image to try and add to the homepage of the website and add it with a general description of how the device works
  - Add information to the medical history tab such as DOB, name, contact information
  - Add contact information
  - Become less confused by html and css
- Andrew Holman:
  - Finalize the respiratory database ML algorithm
  - Begin integrating ML algorithm into the website
- Megan Kasabian:
  - Continue to work with the hardware team to test the microphones.
- Jordan Spidle:
  - Finish inserting microphone into stethoscope

Summary of weekly advisor meeting:
      We met with Dr. Khokhar 4/11 and caught him up to speed with the progress of the project

- ADC/Bluetooth
  - Can get Bluetooth project to run on its own and get ADC to run on its own
  - Having a lot of trouble getting Bluetooth running alongside ADC in merged project where libraries are generating conflicts on compilation
  - Will start pursuing a wired approach as a workaround so we can have the project at least work
- Machine learning/Website
  - Make sure we will automatically classify a recording shortly after it is made
  - Finish the heartbeat classifier so we can move to the respiratory classifier and finish the website.
  - General aesthetic modifications and additional informations and functionality
- Hardware
  - Ensure the physical device properly captures the pressure waves

Updated UI