EE/CprE/SE 492 WEEKLY REPORT 2

2/9/2020 - 2/22/2020

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 getting set up for all the components that need to be completed this semester. For the software we continued experimenting with the ADC and Bluetooth transmitter by creating sample projects. We also implemented basic file sharing on the website which allows doctors to view the audio files of patients. For hardware, the stethoscope circuit analysis was re evaluated and confirmed through simulations. We also have narrowed our options for microphones, with plans to order one next week.

Past Week Accomplishments:
- Erik Becker:
  - Familiarize myself with OrCad simulation again
  - Re evaluated and confirmed filter circuit analysis and component values through simulation.
- Joe Dobosenski & Margaret Heaslip:
  - Evaluated various sample programs and got two different projects working
    - The first project configures/uses the ADC of the board and outputs the readings to console
    - The second project allows users to pair a mobile device and read the real time status of push buttons on the microcontroller
  - Did some preliminary research on the BLE sdk to to figure out to actually program custom programs
- Andrew Holman:
  - Continue to update specific user functionality on the website.
  - Implement file sharing between users on the website.
- Megan Kasabian:
  - Met with my biosensors professor and was given

information about microphones.
- ○ Researched microphones and I'm looking into if the microphone should already have an amplifier attached.
- ● Jordan Spidle:
  - ○ Contacted Recording Engineer for possible microphones to use
  - ○ Continued research for microphones

Pending issues

- ● Joe Dobosenski:
  - ○ Need to evaluate BLE constraints to see if we will need to do any sort of compression for data we send through
- ● Erik Becker:
  - ○ Need to test the physical filter circuit. Confirm simulation data on frequency response. This includes cutoff frequencies and attenuation.

Individual contributions

NAME	Hours this week	HOURS cumulative
Andrew Holman	5	20
Megan Kasabian	4	5
Erik Becker	4	5
Jordan Spidle	3	4
Maggie Heaslip	4	8

Joe Dobosenski	10	16

Plans for the upcoming week

- Erik Becker:
    - Complete physical testing of filter circuit
    - Work with hardware team to order a microphone
- Joe Dobosenski:
    - Merge two sample projects (ADC and Bluetooth) to try to be able to transmit data to a host device
    - Evaluate the various complications with BLE and data transmission/loss
- Margaret Heaslip:
    - Working with Joe to develop program for board
    - Coding so UI stuff for the website
    - Learn html/css
- Andrew Holman:
    - Generally improve machine learning algorithm
    - Add selection of specific conditions
- Megan Kasabian:
    - Finish research on the microphone
    - Meet with other hardware members before purchasing microphone
    - Join Erik in the TLA to perform testing
- Jordan Spidle:
    - Finalize microphone and start testing.

Summary of weekly advisor meeting:

We met with our advisor (Dr. Khokhar) on 2/14. This was the first meeting we have held with him since returning from break. Most of our conversation was catching him up on our progress that was made since the end of last semester.

There was a discussion about our machine learning approach. Dr. Khokar has suggested that we adapt our approach to be able to identify different heart abnormalities. Previously, we were taking a binary approach

to our diagnosis functionality where it would only indicate yes or no as to whether there were abnormalities or not.