CPRE 491
Nov 15-21, 2024

Weekly Report 10

Advisor: Professor Meng Lu

Group: 22

Members:
- Sajan Patel (Fullstack Software)
- Daniel Karpov (Data Processing)
- Jay Patel (Data Processing)
- Ty Beresford (Fullstack Software)
- Chuck Mallek (Physical & Electrical Design)

Project: CyVital

Project Purpose: CyVital project is dedicated to providing modular hardware in the form of sensors and its corresponding software counterpart to read, analyze and display data seen within the sensors. The hardware-software will be used for the Biomedical Engineering Lab, so it must be created so that students, professor(s) and TA(s) can use it with ease.

Languages:
- Graphical User Interface: Python
- Backend Data Analysis: Python

System:
- Configuration: Universally modular
- Open Sourced: GitHub Repository

License:
- For educational purposes through Iowa State

Weekly Summary

Group Success:
As a group, we made solid progress for our EKG device again in which we intuitively added the signal analysis processing to our graphing GUI. Still, this will need to be tested, but it works on raw .csv data. We also succeeded in adding an exported PDF on the data gathered which will be used by the students to learn how signal analysis changes the raw data. Adding a SQL database might add too much complexity for a user it will be scrapped for now.

Individual Roles:

Sajan Patel Hours: 6 Cum. Hours: 53 Issues: N/A	Worked on reading sensor data from sensors and using signal processing API to clean up raw data. Also looked into making a report for data after the test is run.
Daniel Karpov Hours: 6 Cum. Hours: 47 Issues: N/A	Worked on getting the ECG data into a PDF for a final document that appears once the program run.Also worked on a new signal processing library that shows graphs.
Jay Patel Hours: 6 Cum. Hours:53 Issues: N/A	Worked on an alternative signal processing API for the ecg sensor that allows for real time signal processing and data extraction
Ty Beresford Hours: 6 Cum Hours: 53 Issues: N/A	Produced fully working GUI concept with potential for [matplotlib] graph implementation
Chuck Mallek Hours: 6 Cum Hours: 53 Issues: N/A	Researched how to implement a database of our own and came to the conclusion that It might not be the solution we were looking for. I also asked our client about it and they said to scrap it for now. I will continue on it if the client makes the request.

Advisor Meeting

Not much was said at the advisor meeting. We updated him on what we were doing and he gave us the green light to keep going in the direction we were.

Room to improve:
Nothing really to improve. We made good progress this week and just want to keep it up.

The Good:
Keep up the good work from last week and try to get as much done with the signal processing and report as possible.

Upcoming Week

Upcoming Group Success:

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Upcoming Individual Roles:

Sajan Patel	After the break, I am gonna keep working on making sensor data more readable and clean for output. Also, work on making a report for the user after all tests are run.
Daniel Karpov	Will continue to work on outputting data to the PDF. We need to output the heart rate and other vitals that come from reading the heart rate.
Jay Patel	Will continue to work on real time signal processing for the ECG sensor to accurately detect and sharpen data for r-peaks and atrial and ventricular polarization/depolarization
Ty Beresford	Will begin sanitized data integration with data API; will investigate in potential issues in latency between GUI and data API.
Chuck Mallek	After Thanksgiving break, I will work on creating a lab document for the EKG sensor. I will also start researching the next Iteration of our prototype. This will mean making a “box” for the project making it modular which will eliminate some of the complexity for the users.