CPRE 492
Feb 13, 2025

Status Report 2

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 and pulse oximeter devices in which we could pick up a proper signal to the Analog Discovery 2 through our own GUI interface. We have now started the signal processing on our GUI on the data received from the DAQ. We are working on implementing an API that will take the signal produced and will find the “features to extract” from that data.

Individual Roles:

Sajan Patel Hours: 6 Cum. Hours: 59 Issues: N/A	Started a new sensor this week. Attempted to use pulse oximeter and have it work with existing code given by DAQ. Also made ECG sensor work with the DAQ and existing software
Daniel Karpov Hours: 6 Cum. Hours: 59 Issues: N/A	We started testing the new pulse oximeter and researching how we would implement it into code—also started looking into selecting different sensors to use from the same breadboard.
Jay Patel Hours: 6 Cum. Hours: 59 Issues: N/A	Developed new ecg method non reliant on previous python apis. Adjusted and tested for the new DAQ device and it’s specific API
Ty Beresford Hours: 6 Cum Hours: 59 Issues: N/A	Began purging GitHub repository to adjust for new coding standards with the new DAQ device; explored ImGui Python Library to allow more modularized GUI approach.
Chuck Mallek Hours: 6 Cum Hours: 59 Issues: N/A	We started implementing the pulse oximeter sensor with the Analog Discovery 2 software and researched how to implement our muscle sensor with the Analog Discovery 2.

Advisor Meeting

Room to improve: None. We found our stride and are ready to ramp up our senior design effort development to meet our deadline.

The Good: This week, we received new components to convert our prototype of one physiological sensor to 3 or more.

Upcoming Week

Upcoming Group Success:
→ Meet on sunday to try to get the rest of the sensors connected and working with Waveform.

Upcoming Individual Roles:

Sajan Patel	Try and figure out how to make a pulse oximeter work with the given code. Continue to research APIs that will make integration easier.
Daniel Karpov	Continue to work on the new sensors. We will start writing code modules where a user can select what type of sensor is being used, and then that specific sensor data gets outputed.
Jay Patel	Continue to develop new ECG Data analysis methods and begin work on blood O2 analysis if issues are resolved with data processing
Ty Beresford	Begin working on individualized GUI pages to consistently pull, refresh and display data.
Chuck Mallek	Resume working on the physical aspect of the project, including figuring out the new sensors we were given and how to connect them to the new DAQ oscilloscope device.