CPRE 492
Feb 27, 2025

Cy-Vital Status Report 3

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: 65 Issues: N/A	Created code for one of the sensors available. Data can be obtained and connected to the DAQ. But still running into errors
Daniel Karpov Hours: 6 Cum. Hours: 65 Issues: N/A	Worked on getting the AD2 connected to the python program. I found that the connection was working correctly but couldn't transfer any digital or analog output or input. Going through the AD2 SDK.
Jay Patel Hours: 6 Cum. Hours: 65 Issues: N/A	Working with data acquisition using AD2 python libs, debugging errors related to scope channel initialization
Ty Beresford Hours: 6 Cum Hours: 65 Issues: N/A	Fully implement [pyimgui], the python bindings for imGui. Frame locking, custom menu bar and items.
Chuck Mallek Hours: 6 Cum Hours: 59 Issues: N/A	I successfully tested the multiplexor chip, the pulse oximeter chip, and the muscle sensor chip as I got them all working on the Waveforms software.

Advisor Meeting

Room to improve: We need to get the Software to work with the DAQ and sensors.

The Good: We got multiple sensors to work properly on the hardware side and got the multiplexer to work.

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	Continue to work on getting the sensor to work with DQ and hardware. Research possible ways to implement data analysis into code.
Daniel Karpov	Look into the AD2 SDK and do a walk-through on using Python to connect to the AD2. Start writing code for reading other sensor data.
Jay Patel	Continue working on data analysis methods, potential migrate existing code to an AD3 device if Dr.Lu has one to spare
Ty Beresford	Eliminate bloatware within [pyimgui] to better attach to existing backend. Provide assistance to backend for frontend and backend re-write.
Chuck Mallek	I will begin fully developing the biological sensor, including working on a design to house the electrical unit and soldering the remaining sensors to create a final package for our project.