EE/CprE 492 Bi-Weekly Report

03/24/18 - 04/06/18
Sdmay18-22: Adaptive Wireless Wearable Neuro-Stimulator
Swamy Ponpandi / Adan Cervantes

Team Members

Kevin Wang — Meeting Facilitator
Kevin Simons — Test Engineer
Matthew Stephenson — Report Manager
Patrick Walsh — Communications Manager
Brian Weber — Chief Engineer

Weekly Summary

Website

Data POST endpoint works correctly, we can now receive data from the android app and put it into the database quickly. I touched base with our client about moving our website resources to a server that he owns, and will start making preparations for that shortly. Added the ability to create a user through the web interface as well as started to add a new endpoint to register a device. Continued work on getting the php and js graphing library connected.

Android App

A new background service has been added that can take varying sizes of data and send them off to the database. The background service uses the internet connection of the device to upload the data to the web server where it is then pushed up to the database. The app is also now capable of communicating with the wearable device via bluetooth. It can both send and receive data.

Wearable

All code has been integrated. The driver code for the heart rate sensor, the driver code for the temperature sensor, and the driver code for the vibration motor have all been integrated. Before, they were all their own separate projects. This also required rewriting multiple drivers .

The drivers had sleep() calls which meant when integrated with other parts, they did not work because they were using too much processing time. We then changed it so that they were all check the current system time to see if it was there turn to run rather than just sleeping until it was. Fair scheduling is definitely a time consuming part of this project. Wrote methods to send packets in a specified format at a given frequency. It stores all the current data in an array of structs so that when the phone and wearable are connected, it can send past data. That leaves the accelerometer left.

Past Week Accomplishments

Website

- Completed the data POST endpoint and tested it
- Gave demo to client, and started implementing the feedback
- Removed all ISU dependencies from web app
- Added create user button to website
- Added a check when creating a user to verify the username does not exist
- Added more tests to the website endpoint test script

Android App

- Created background service for Android app to push data to database.
- Bluetooth code and the rest of the app have been integrated together.
- Can now send and receive data from the wearable via Bluetooth.
- Create an account login now checks for return statuses to see if a valid account can be created.

Wearable

- Integrated code for different sensors
- Revamped code for multiple sensors to allow for fair scheduling
- Wrote code to store data in packet format for transmission
- Able to do rudimentary communication both ways between wearable and app

Pending Issues

- Connecting php with js graphing library to graph real data
- Finish the register device endpoint so it works through the android app

- Data upload background service uses hard-coded data that is sent repeatedly to the server, it needs to be updated to use real data stored on the device.
- App UI needs to be updated.
- Device settings needs to have functionality implemented
- Filter data coming from the temperature sensor to remove bad readings
- Get full packets being transmitted
- Get accelerometer working

Individual Contributions

Name	Contribution	Per Week Hours	Cumulative Hours
Kevin Wang	Able to read data from the Arduino over Bluetooth, confirmed data is being sent over. Worked on parsing (as the data comes in) and storing off the data into local database in Android App.	7	49
Kevin Simons	Was working on the website again this week, was able to finish the data POST endpoint and worked with Pat to get that tested and he can now put data from the phone into the database. Met with the client to give him a demo of the site and got some feedback from him, as well as information about the mwigration we'll need to do before the end of the semester. General website improvements listed above.	5	50
Matthew Stephenson	Integrated code including rewriting most of our drivers to allow for fair scheduling. Implemented a struct for representing a packet that I store in an array every so often (flexible frequency as per the client's request). Wrote a basic function that will be used to send every so often if connected to the android device. Tested much of the wearable code.	6	58
Patrick Walsh	Added a new background process to the Android app to push data to the database.	5	58

	Did some research into where to store data in an Android app for data from the wearable.		
Brian Weber	Worked with Kevin Wang to connect the Arduino and the app. Then I worked with with the accelerometer, and sodderd it.	5	41

Plans for Upcoming Week

- Get php hooked up with graphing library to graph real data from the database
- Complete and test register device endpoint so we can uniquely identify a wearable
- Update database upload background service to use stored data from the app instead of hard-coded values.
- Update device settings to allow functionality
- Update app UI
- Get local Android App database working so real sensor data can be fully integrated
- Get accelerometer working
- Finish testing wearable
- Get wearable and android app sending whole packets and responding
- Perform more filter of data from the temperature sensor (there is some noise currently)

Summary of Advisor Meeting

3/30/18

     We gave a demonstration of components to advisor: showing communication between Arduino and Android Application over Bluetooth (receiving and sending messages between the two), as well as Application communication with the database. Some discussion on upcoming final assignments as well, such as poster and paper, making sure things are on track.

4/06/18

     Some discussion on plans for working on poster, paper, and final presentation. Discussed with advisor some issues with reading accelerometer data properly from sensor, and possible alternatives if solution couldn't be worked out. Showed advisor progress on integration of data received over Bluetooth saving into persistent storage so it can be retrieved later to send to database. Progress check as usual for each component: hardware, Android App, website.