

EE/CprE 492 Bi-Weekly Report

02/23/18 - 03/10/18

Sd may 18-22: Adaptive Wireless Wearable Neuro-Stimulator

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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:

These weeks were mostly spent working on the connection between the website and the app. We were able to create an endpoint that allows the phone to POST data and will return either successful logon or failed. In this we figured out how the data is actually received on the server and started endpoints for actually putting data from the phone into the database.

Android App:

These past two weeks we have been working on getting the Bluetooth and network functionality working. We are currently unable to make a connection to the web server properly, but are able to create JSON object requests and start the process of connection. We also added new functionality in the login screen to create a POST request and send it off to the server. There is then logic to display a message saying “invalid username or password” if the conditions are not met to log into the app. We are currently working on creating a background process for Bluetooth so that it will passively take data in from the wearable. At the end of this week, we were able to list the devices available to pair and understand better what needs to be done to create the background process. We are also working on creating more customized images to use for navigation of the application.

Wearable:

Over the past two weeks we have been able to make a decent amount of progress. The code for the heart rate sensor has been revamped. We are able to get accurate readings, as

before, but we are also able to get them for arbitrary lengths. What we were doing before only would have allowed us to send a reading every minute (measuring heart rate for a minute then transmitting). Now we maintain a linked-list of the last minute of data in order to enable us to send heart rate readings at arbitrary intervals. This is mostly useful for expandability going forward. There may be still a need to perfect it so that we can have a longer list to eliminate more bad readings. Meaning, maintain a longer list of readings (readings for the last 2 minutes or more). More experimentation is necessary to determine that.

We looked into the vibration motor and have a decent understanding of what needs to be done to power it. The actual Arduino pins do not have the current output necessary to power a motor. After looking into it, it looks like it would be possible to use a transistor as a switch so that we can enable and disable the vibration motor from the Arduino.

The bluetooth on the wearable is able to pair with an android device. We are working on the transmission portion. We can send info from the phone to the wearable, we currently are working on the ability to send from the wearable to an android device.

Past Week Accomplishments

Website:

Created logon endpoint so we can have actual logins for the phone. Was able to successfully parse the POST data, which means the next endpoints we create have the base code needed already done.

Android App:

Can generate GET requests and add them to a queue to query the web server. A new message has been added that only becomes visible when improper login credentials are used and the login button has been pushed. The pair device, button in the settings screen now allows the user to list the available Bluetooth devices.

Wearable:

We looked into the vibration motor and have a decent understanding of what needs to be done to power it. The actual Arduino pins do not have the current output necessary to power a motor. After looking into it, it looks like it would be possible to use a transistor as a switch so that we can enable and disable the vibration motor from the Arduino and use either a battery or VCC to power it.

The heart rate sensor can give sensor readings at arbitrary length intervals by maintaining past readings.

Continued looking into how to send data from the wearable to the Android device.

Pending Issues

- Adding phone to website connection to populate the database with info
- Adding a create user endpoint
- Finding a javascript graphing library for the website data
- Send info from wearable to phone
- Add ability to send a pulse on the vibration motor using a transistor and a battery (or VCC)
- Test heart rate sensor code more thoroughly and experiment maintain a longer list of measurements
- Icons on bottom of Android app are generic and need to be changed to something custom.
- There are currently no requests generated that will push data to the database.

Individual Contributions

<u>Name</u>	<u>Contribution</u>	<u>Per Week Hours</u>	<u>Cumulative Hours</u>
Kevin Wang	Select and save paired device in Android App. Data sent between phone and phone (spoofed data) when application in foreground, will have to work on communication in background and with phone-to-Arduino.	4	26
Kevin Simons	Adjusted login code to work both from the website through our login form, as well as posting data from the phone and verifying the user exists. In doing this we found out more about how to securely handle passwords and will be updating that in the future. After figuring out how to parse the POST data I started building the other endpoints we'd need to create users as well as put data into the database.	4	28
Matthew Stephenson	Added to the heart rate sensor's code base. Added the linked-list functionality so as	6	28

	not to limit sending data only at even minute intervals. Found a good workaround to power the vibration motor due to the limited power that the Arduino can supply using a transistor.		
Patrick Walsh	Switched to using the volley library for web requests. Made it so that the user is only able to log into the app if the credentials are in the database. Added a progress spinner and invalid login message. Set up a meeting with the client. Added icons instead of buttons for navigation of application.	8	40
Brian Weber	Continued working on using bluetooth and a tablet. Able to send information form the arduino to the tablet.	5	24

Plans for Upcoming Week

- Continue JavaScript graphing library research
- Complete endpoints for putting database info and creating users
- Get vibration motor hooked up into a circuit and be able to send a pulse
- Get Bluetooth from wearable to pair with phone
- Create methods to generate web requests for data uploads from android device.

Summary of Advisor Meeting

3/2/18

Mostly just another progress check. Advisor said he would like to see connection of device (prototype wearable) to phone (Android App), as well as Android App to database for next meeting. This was the only meeting for this period, next meeting after break is expected to yield more progress.