

EE / SE 492 Week 4 Status Report

Oct. 12, 2019 - Oct. 25, 2019

Group: sddec19-20

Project: Ultra-thin electronic skin for real-time health Monitoring

Advisor/Client: Liang Dong

Team Members:

Sovann Chak: Software Architect, iOS Developer

Omar El-Sherbiny: Circuit Design of Data Processing and Communication

Justin Gordon: Software Developer, Communication research

Sungmin Kang: Circuit design and analysis of Mobility sensor

Sangwon Lee: Circuit design and analysis of ECG, DMD 3D printer

Passing Week's Accomplishments

Software Engineers

(Sovann)

- Worked on code for Arduino Nano BLE device to communicate via bluetooth low energy
- Set up peripherals for sensors so we can begin comms with the central devices (i.e. laptop or cellphone)
- During group meeting we discussed ways to connect arduino with the fabricated sensors

(Justin)

- Implemented graphing framework into android app
- Gathered mock data on ECG, EMG, Accelerometer
- Tested graphing framework and tweaked visuals
- Obtained feedback from the client about how they would like data presented from sensors

Electrical Engineers

(Omar)

- Run preliminary tests using an Arduino UNO and processing mocked data for a mobility sensor
- The tests were successful; however, we need to keep in mind the mechanism of transduction, which will alter the shape of the sensor. It's best to start looking into using NFC modules to transmit the data from the sensor to the arduino, and then using a BLE module to transmit the processed data to the mobile application

(Sungmin)

- Fabricated the sensors in the new methods (eco-flex + graphene base)
- Connect all of connector into the sensors
- Found the way to use pad-formed electrodes

(Sangwon)

- Fabricated the sensors(ECG) in the new methods (eco-flex + graphene base)
- Connect all of connector into the sensors

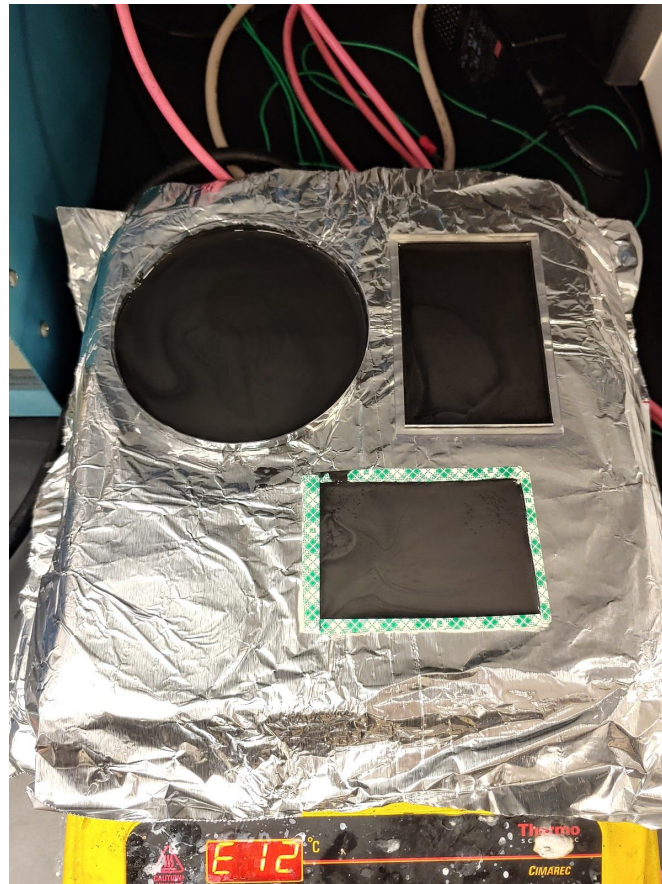


Figure 1. Fabricating sensors eco-flex + graphene base and another graphene layer.

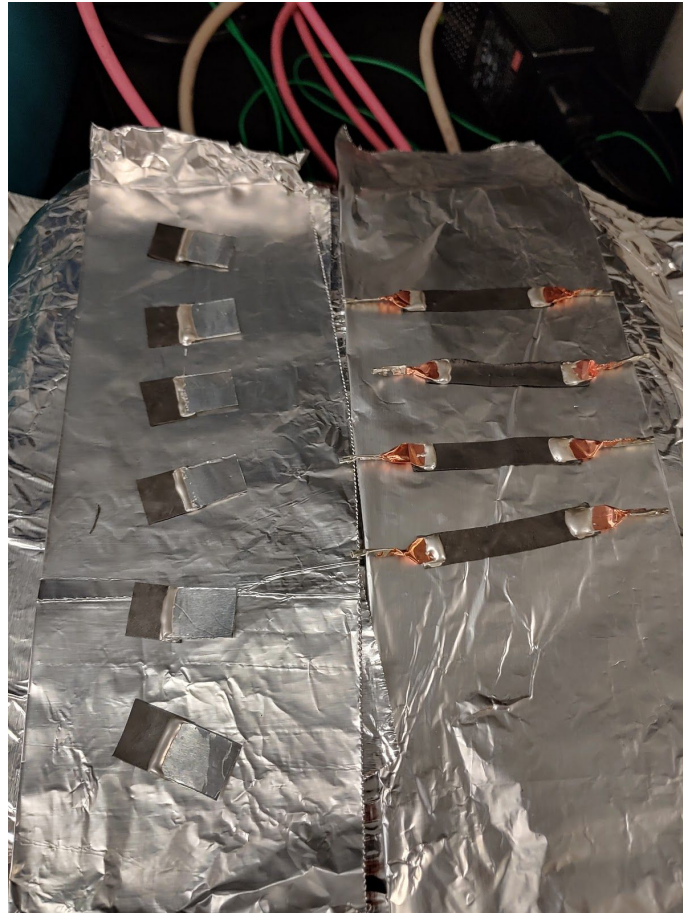


Figure 2. ECG and Mobility sensors.

Individual Contributions

| Team Member | Contribution | Weekly Hrs | Total Hrs |
|-------------|--|------------|-----------|
| Sovann | Worked on BLE communication by writing code for the peripheral aspect of our project (sensor communication). | 6 | 81 |
| Justin | Implemented graphing framework, discussed implementation details with Dr. Dong | 6 | 73 |

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|---------|--|---|----|
| Omar | Ran preliminary test using arduino | 6 | 66 |
| Sungmin | Changed the way to fabricate sensors (graphene + eco-flex base), and connect all of connector. Also, found a way to use our patch-form electrodes. | 6 | 81 |
| Sangwon | Fabricating sensors with new method which is graphene and eco-flex base and connecting with contact. | 6 | 81 |

Plans for Next Week

- (Sovann) Meet with EE team to begin testing sensors and retrieve data via BLE
- (Sovann) Work on actual application to provide a nice, easy to use mobile application
- (Sungmin) Test the sensors with software devices
- (Sungmin) Try to find a better way to improve contact our connectors
- (Sangwon) Fabricating various size and test voltage difference.
- (Sangwon) Testing sensor with communication device such as BLE
- (Justin) Continue to tweak features on the application until the presentation of the app is nice
- (Justin) Implement multithreading to have real-time data from sensors placed into graphs
- (Omar) Survey of commercially available NFC modules
- (Omar) Test the EMG and ECG sensors using mocked data