EE / SE 491 Week 5 Status Report

Mar. 11, 2019 - Mar. 15, 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 and analysis of Sweat sensor

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)

- Client finally reviewed the parts list and the parts list was approved
- The client has many of the parts in his lab, so I will visit and retrieve the necessary items in order to begin interfacing the Raspberry PI with the various parts.
- Held off on attempting to implement medical algorithms due to not having a heart beat sensor yet, instead focusing on data visualization for now
- Weighing the pros and cons of various data visualization frameworks for iOS, some potential options
  - https://code.google.com/p/core-plot/
  - http://epreston.github.io/PSArborTouch/
- Researching iOS security - our plan is to have all data stored locally, so cybersecurity shouldn't be too much of an issue - however I'm worried about the sniffing of bluetooth data

(Justin)

- Working on architecture of application that is going to be on android devices
- As mentioned above security will mainly be troublesome in the communication of the devices since files are stored locally and only the user will have access to this data
- Waiting for parts to interface with the raspberry pis to begin working on communication between similar devices

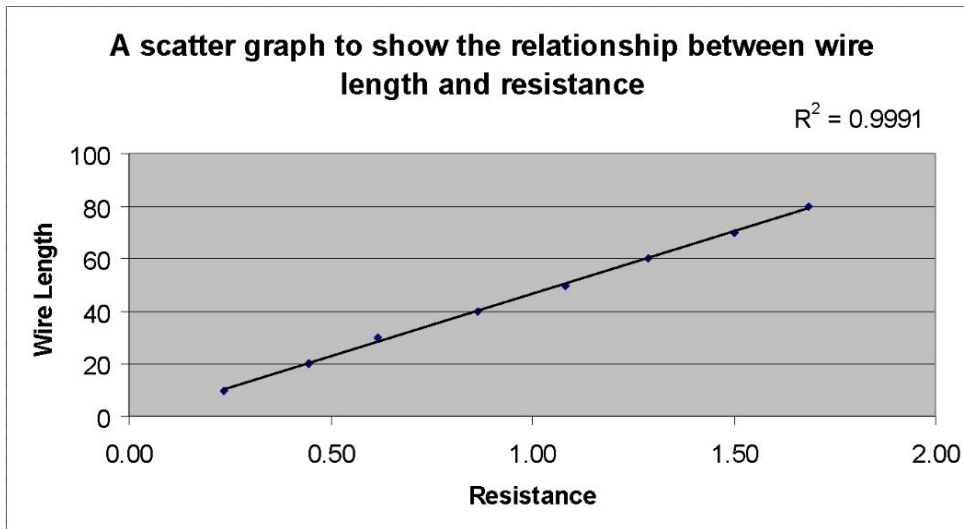*Electrical Engineers*

(Omar)

(Sungmin)

- Our plan is changed. We will focus on circuit design based on special tape, then we will focus on 3D printer.
- Special tape is already in our client's lab, so I reviewed his paper.
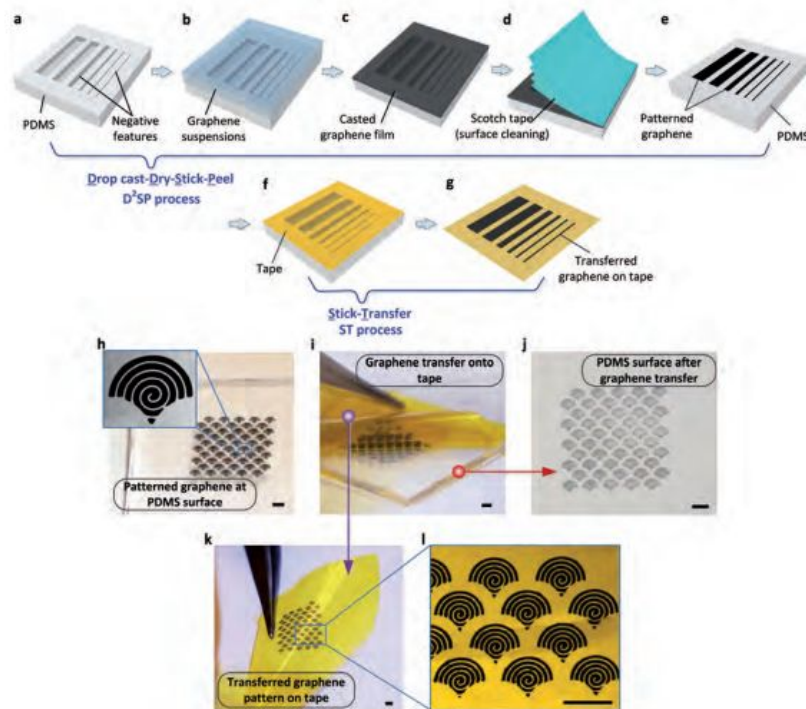
(http://www.memslab.net/uploads/1/1/5/5/11554938/73_reduced_resolution.pdf)

(Sangwon)

- Professor changed plan to not working on DMD 3D printer
- First working on mobility sensor which connect to knee and shoes sensors that have 20 sensors.
- Basic principle of mobility sensor. Detecting resistance of sensor, if ultra thin skin stretch resistance change and by using difference resistance we can detect mobility.

A scatter graph to show the relationship between wire length and resistance

$R^2 = 0.9991$

Wire Length vs Resistance

Individual Contributions

Team Member	Contribution	Weekly Hrs	Total Hrs
Sovann	Switched focus to data visualization on iOS device due to not having the parts, and researching some security concerns since this application will handle sensitive data.	6	38

Justin	Continued working on architecture of application and studying technologies used within android development.	6	37
Omar			24
Sungmin	Focus on circuit design, and we will use special tape, so I reviewed our client's paper related to special tape, and already our client has it in his lab.	6	38
Sangwon	Due to plan change visit lab and research about special tape that we will use and focus on mobility sensor with shoes sensors. Research how detect mobility.	6	38

Plans for Next Week

- (Sovann) Visit Dr. Dong's lab and take inventory of the parts I may need
- (Sovann) Order the parts that I need from the ETG
- (Sovann) Research the security of bluetooth and other minor security issues we may face
  - * I'm familiar with web security, however, not too familiar with bluetooth protocol ..

- (Sungmin) Being familiar to circuit design with graduate student who is working in our client's lab.
- (Sungmin) Being familiar to basic idea about circuit design.
- (Sungmin) Think about basic mobility sensor in special tape.
- (Justin) Acquire parts and algorithms
- (Justin) Begin using the raspberry pis
- (Justin) Begin working with sensors once acquired
- (Sangwon) Working with graduate student and learn how to design circuit in special patch
- (Sangwon) Make case list that we have to experiment to collect data.