EE / CprE / SE 491 – sdmay25-12
Pressure Sensor Patch
Week 7 Report

October 24th, 2024 - October 31st, 2024
Client: BAE Systems, Adaptive Adventures
Faculty Advisor: Santosh Pandey

Team Members:

Aina Qistina Binti Azman - *Software Developer*
Bilal Hodzic - *Software Lead*
Nathan Turnis - *Software Developer*
Osaid Samman - *Scrum Master/Manager/Team Organization*
Sabrina Francis - *Hardware Developer*
Zane Lenz - *Hardware Developer*
Ivan Alvarado-Santoy - *Hardware Lead*

Weekly Summary

This week, our team held a biweekly meeting with the client, where we gained further insights into their specific project needs and requirements. Additionally, we achieved a technical milestone by successfully establishing a WebSocket connection between our Android app (developed in Android Studio) and a Raspberry Pi Pico. Using a network connection hosted by the Pico, we conducted initial testing, confirming that we can reliably transfer data from the Pico to the app. This progress validates the data communication capabilities essential for the project's functionality.

Past Week Accomplishments

- Osaid Samman:
  - Continued to maintain contact with clients, advisor, and grad students. Kept the team organized and progressing towards the goal. Assisted with some CAD design. Focused on having a clear goal for the next client meeting.
- Ivan Alvarado-Santoy:
  - Learn and experiment with Raspberry Pi Pico and micropython development
  - Research refactoring of HX711 load cell amplifier module library from c++ to micropython to for use on the Raspberry Pi Pico to read load cell data
  - Consolidate Design and Requirements information in a Turtle Diagram for presenting with stakeholders (BAE Engineers, AA Reps)
- Zane Lenz
  - Continued learning fusion 360
  - Experimented with load cell code
- Nathan Turnis:
  - Initial basic learning of Kotlin
  - Found Android Jetpack Compose - a UI library for front-end Android

development in Kotlin
        - This library could be used in future iterations of the project, once we get communication going
        - Avoids XML and codes UI components directly in Kotlin; it does not seem too difficult
    - Prototyped with connecting to a web socket in an Android application
- Bilal Hodzic
    - Began exploration of Kotlin language
        - Started learning basic Kotlin
        - Looked into feasibility of using Kotlin for the application
    - Wrote socket code for interacting with the Raspberry Pico W microcontroller
        - Wrote code for generating WIFI on pico
        - Wrote python program to connect to socket and decode canned message that is sent
- Aina Azman:
    - Learned basic Kotlin.
        - Took a short course on basic kotlin.
    - Continue working on UI/UX of the application.
- Sabrina Francis:
    - Met with Lee to get an overview of Fusion 360
        - Learned how to use software
        - Discussed ideas for the sensor board
    - Created CAD Design for the board to hold sensors
        - Gave Lee the design for the board to get cut out

Individual Contributions

Team Member	**Contribution**	**Weekly Hours**	**Total Hours**
Aina Qistina Binti Azman	Learned basic Kotlin and continue working on UI/UX of the app.	6	31
Bilal Hodzic	Learned some Kotlin and wrote python socket code	10	34
Nathan Turnis	Basic Kotlin & Jetpack Compose, Web socket	6	29
Sabrina Francis	Met with Lee to learn Fusion 360 and made sensor holder design	6	30
Osaid Samman	Continued to maintain contact with clients, advisor, and grad students. Kept the team organized and progressing towards the goal. Assisted with some CADD design.	5	19
Zane Lenz	Learned Fusion 360 and worked with arduino code	6	30

Ivan Alvarado-Santoy	Experiment with Raspberry Pi Pico and convert needed libraries for interacting load cell sensors	8	28

Pending Issues

- Try learning Kotlin to understand the feasibility of potentially writing the whole app in Kotlin.
- Refactoring of HX711 Load cell amplifier module from c++ to micropython
- Order sensors and other parts

Plans For the Upcoming Week

- For the android app side, start to implement rudimentary views. Start testing with Bluetooth devices generic Bluetooth devices to see if we can get and maintain a connection.
- Further specify the elements that shall be included and implemented in the application.
- Fully refactor the needed libraries for the Raspberry Pi to start receiving data from the load cells and start the calibration process
- Integrate load cell data capturing process with wireless communication