EE / CprE / SE 491 – sdmay25-12
Pressure Sensor Patch
Week 2 Report

September 19th 2024 – September 26th, 2024
Client: BAE Systems
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 focused on identifying market options for a pressure sensor suitable for integration into the pressure sensor patch. After thorough research, we decided to order a commercial sensor patch that shows potential for our needs. While we acknowledge that other sensors may offer better performance, ordering this patch allows us to take an initial step forward and gather valuable insights into the technical requirements for the project. Our team also met with our advisor this week, where we received insights on how we should proceed with the project and where our priorities should be. Our advisor also provided information on where to look for circuits and how to get them in a cheap manner.

Past Week Accomplishments

- Osaid Samman:
    - Reached out to the faculty advisor and client and arranged times to meet with them. Figured out and addressed team goals and deadlines, and where to go from here.
- Ivan Alvarado-Santoy:
    - Researched possible commercially available sensors that could be used for our application: https://www.sensitronics.com/index.htm and how they can be adapted to our project.
    - Define search terms related to sensor types needed for the project.
        - Force Sensing Resistors (FSR's), Multiple Input Matrix Array
- Zane Lenz
    - Researched possible microcontrollers for the device.
        - ESP32 seems promising.

    - Researched possible pressure sensor arrays for the device.
        - Called Sensitronics and got more information about their “shuntmode” array.
- Nathan Turnis:
    - Conducted more in-depth research for commercial pressure sensors that we could buy. Found some off Amazon and Temu.
    - Met with advisor who advised potentially using Microsoft Power BI as a tool to show the output data. It looks mainly like an application to view data, which may not be what we need.
    - Looked at Sensitronics example code given to how they recommend viewing the output.
- Bilal Hodzic
    - Researched pressure sensors that could work for our project. Specifically researched interfacing with pressure sensors in software and how that would look.
    - Looked into Microsoft Power App for automatic app building. Looked specifically into what loading data into Power App would look like to get a general idea of how we can go about getting the sensor data into a usable format using the Power suite.
- Aina Azman
    - Researched on possible commercial pressure sensors that may be adapted into our project.
    - Researched on the body parts of adaptive sports athletes that have a higher risk of developing pressure sores.
    - Reached out to TekScan https://www.tekscan.com/products-solutions/embedded-force-sensors to gather their input on the suitability of their pressure sensors for our project.
- Sabrina Francis:
    - Researched different types of pressure sensors that would possibly work for our project’s requirements.
    - Researched microcontrollers that could connect to our sensor and Bluetooth to connect to our app.
        - Best option I found was Nordic 52840.

Individual Contributions

Team Member	Contribution	Weekly Hours	Total Hours
Aina Qistina Binti Azman	Researched on possible commercial pressure sensors.	4	4
Bilal Hodzic	Researched software interfacing with pressure sensors and microcontrollers. Researched the power app platform and how it's used to quickly create apps.	4	4
Nathan Turnis	Researched commercial pressure sensors and use of Power BI App	4	4
Sabrina Francis	Researched various sensors and microcontrollers that could work for our project.	3	3
Osaid Samman	Organized the team notes, goals, and accomplishments as well as reached out to the clients for setting up meeting times. Reached out to advisor and met with him. Checked in with team members regarding progress.	2	2
Zane Lenz	Research for microcontroller and pressure sensor array.	3	3
Ivan Alvarado-Santoy	Researched various sensors and microcontrollers that would be suitable for our project.	4	4

Pending Issues

1. Order sensors
    - Need to start ordering immediately, so we can begin testing the products ahead of time, aiming to choose the one most suitable for our pressure sensor patch.
2. Order/Acquire microcontrollers
    - One sensor uses an Arduino, which we have access to.
    - Would prefer to use a different microcontroller that is smaller and has a lot of known support like the ESP32.

Plans For the Upcoming Week

- All group members:
    - Schedule & meet with clients to better understand their wants and needs.
    - Research what is needed for making our silicone mold for the sensor.
- Software - Bilal, Nathan, Aina:
    - Research into the possible pipelines needed to transfer the data from the sensor into an output visible on the screen.
- Hardware - Sabrina, Zane, Ivan, Osaid:
    - Order as needed parts from Sensitronics to start working with the hardware