

EE / CprE / SE 492 – sdmay25-12

Pressure Sensor Patch

Status Report 5

March 13th, 2025 - April 3rd, 2025

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

Osaïd Samman - Scrum Master/Manager/Team Organization

Sabrina Francis - Hardware Developer

Zane Lenz - Hardware Developer

Ivan Alvarado Santoy - Hardware Lead

Weekly Summary

This week, we started to test our device. We conduct multiple tests to ensure our device is comfortable and receives data well. We have planned out various sitting positions we are going to try out during testing in an attempt to cover everyday use cases. We are keeping track of what user is currently testing the device using our websocket data transfer solution on the Android app. We are storing our data in Kafka, which allows for robust data storage and real-time data streaming.

Past Week Accomplishments

- Osaïd Samman:
 - Finalized instructions for product use
 - Helped put together the board
 - Tested the prototype device
- Ivan Alvarado-Santoy:
 - Gathered and updated Hardware spec sheets for creating Engineering Requirements
- Zane Lenz:
 - Designed and iterated on a pressure tile holder. Had a pressure tile holder manufactured.
 - Tested prototype device
- Nathan Turnis:
 - Worked on developing a heat map to show the exact pressure values.
 - Heat map shows red/green gradient indicating pressure level.
 - Added switch to allow the user to indicate there is an imbalance in pressure to help testing.
 - Added user select - allows us to select what user is currently using/testing the

- device to improve our model.
 - Tested our system. Sat on the pad in various positions to see what results we get. Timed how long it took to get an imbalance of pressure. Common positions were leaning left/right/forward/back.
- Bilal Hodzic:
 - Tested system
 - Wrote websocket connection for app to transmit live data
 - Organized database for storing session information
 - Wrote backend websocket handler for working with received data
 - Wrote code to connect to Kafka allowing for storage of streaming data in real time
 - Pushed application to web server allowing for real communication and data collection
- Aina Azman:
 - Adjusted the page flow of the application for seamless user experience.
 - Tested prototype devices and together with team members we collected data for data analysis.
- Sabrina Francis:
 - Soldered and wired together the final device with battery setup
 - Built and tested each tile individually
 - Put tiles together with Pico and battery setup
 - Figured out new pin setup for Pico and tiles
 - Created data collection method
 - Collected data with our system

Individual Contributions

Team Member	Contribution	Weekly Hours	Total Hours
Aina Qistina Binti Azman	Adjusted page flow and testing	8	79
Bilal Hodzic	Connected web sockets. Hosted app on server. Kafka data storage	20	131
Nathan Turnis	User select, imbalance check, heatmap, testing.	8	91
Sabrina Francis	Put the board together with the battery setup and tested.	20	91
Osaid Samman	Finalized instructions	10	66
Zane Lenz	Made device holder, tested device	6	72
Ivan Alvarado-Santoy	Update Hardware requirements	2	83

Pending Issues

- More testing and data collection required

Plans For the Upcoming Week

- Continue to conduct tests on our device
- Improve app communications
- Sprint through the finish line
- Put data through machine learning algorithm
- Build another device