Lightning Talk 7:

Prototyping

PRESSURE SENSOR PATCH

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Project Overview

Description

Develop a pressure sensor patch for Our project aims to create a pressure sensor patch that alerts users with reduced sensitivity to avoid prolonged pressure and prevent pressure sores

Problem Statement

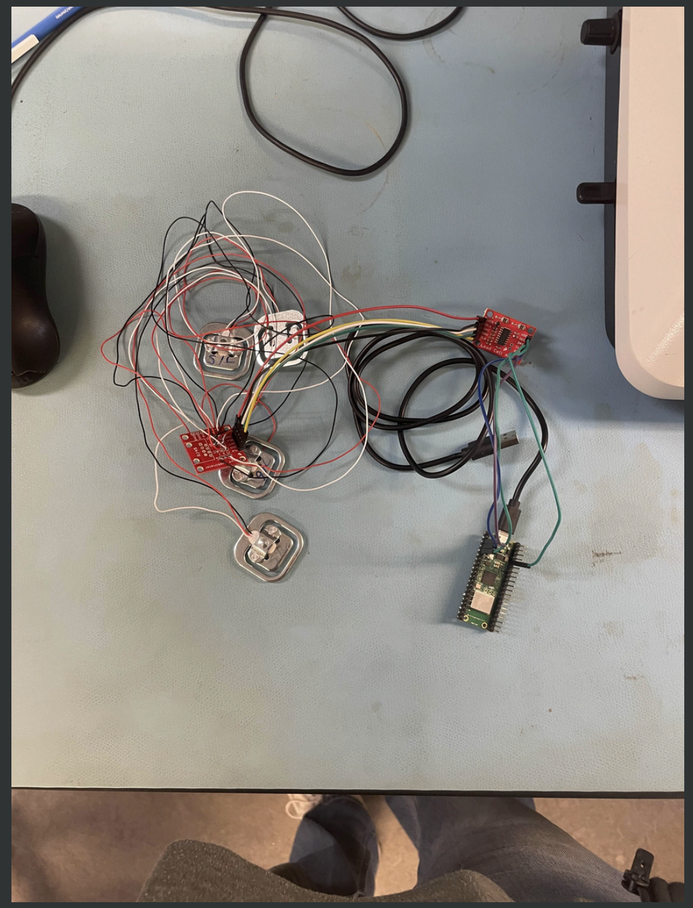
Individuals with nerve damage in their lower extremities are unaware of excessive pressure, risking injury. Our patch provides real-time monitoring to promote timely repositioning

Solution Outline

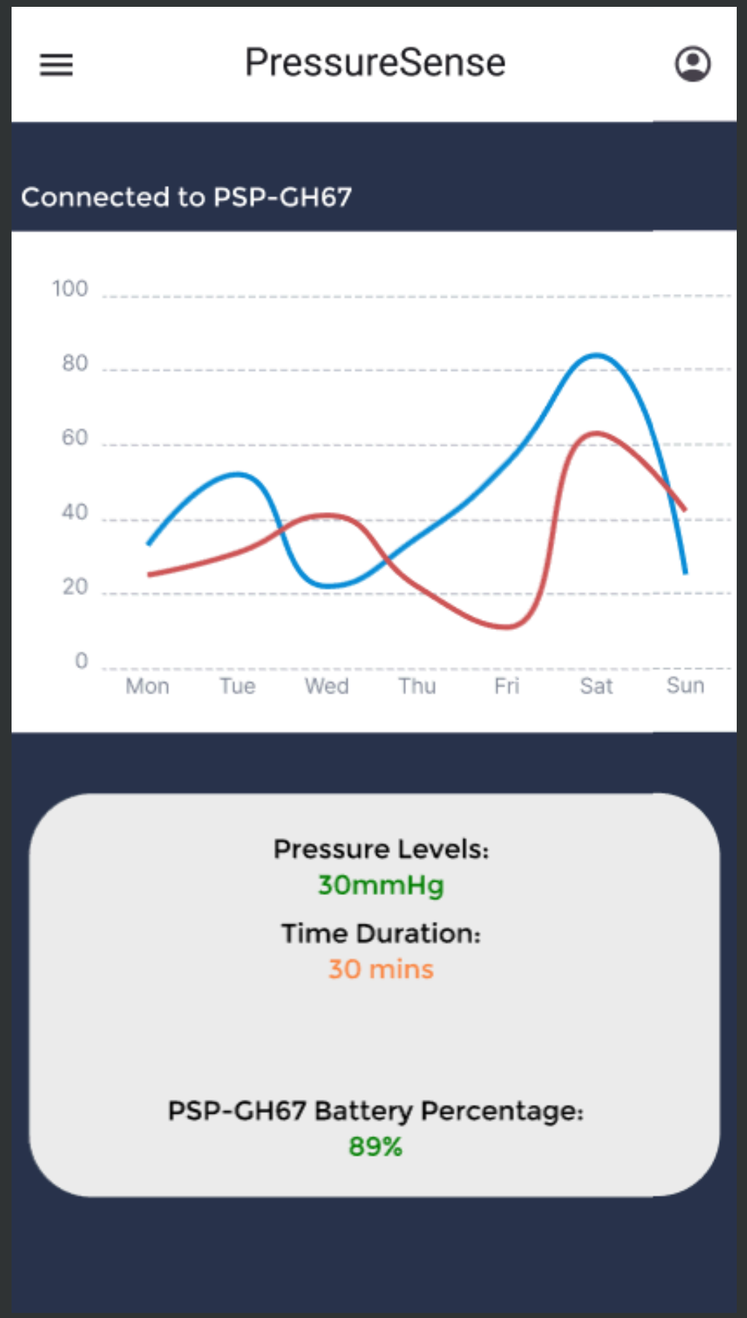
The solution integrates a load cell sensor array, microcontroller, and a mobile app for pressure data monitoring and alert notifications

Prototypes

Pressure Sensor Patch



Load cells connected to pico



Prototypes

Application

For application, we developed initial application prototype, focusing on the Home Page.

The key feature of the application prototype:

- Real-time graph with x-axis representing the pressure & y - axis representing the time.
- Calculation to determine the value when the pressure exceeds the safe threshold.
- Alert notification when the pressure exceeds the safe threshold.

Purpose & Role in Design Story

Purpose:
Our prototype is designed to test core functionalities like accurate pressure sensing, data transmission, and real-time notifications.

Role in Design Journey:
This prototype bridges our initial design and final product by validating essential functions before finalizing form factors and integration.

Learning Objective:
We aim to confirm that our system provides timely alerts and allows users to take preventive action based on reliable pressure readings.

Insights from the Prototype

What worked:

- Gathering data from load cells
- Displaying data from load cells to pico to a python file
- Android app successfully connecting to a socket and receiving data

Challenges encountered:

- Connecting the pico to a client and sending real load cell data
- Form factor of load cells and pad - how to position cells and microcontroller in a comfortable manner

Overall Takeaway:

- Data transfer (pico to app) will be the hardest part as we continue to iterate through the prototype
- Designing a comfortable and flexible pad for the athletes to sit on

Implications & Next Steps

Immediate Modifications:

We plan to refine sensor sensitivity settings and test with diverse loads to ensure accuracy in various use cases.

Future Prototypes:

Our next prototype will incorporate these refinements and begin testing in a real-world adaptive sports context.

Long Term Goal:

Achieve a user-ready product that can operate seamlessly and provide preventive alerts reliably for at-risk individuals.