

# Care-Mate: Wheelchair Pressure Distribution Mapping System

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# Problem

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Patients that are bound to wheelchairs suffer from restricted blood flow.

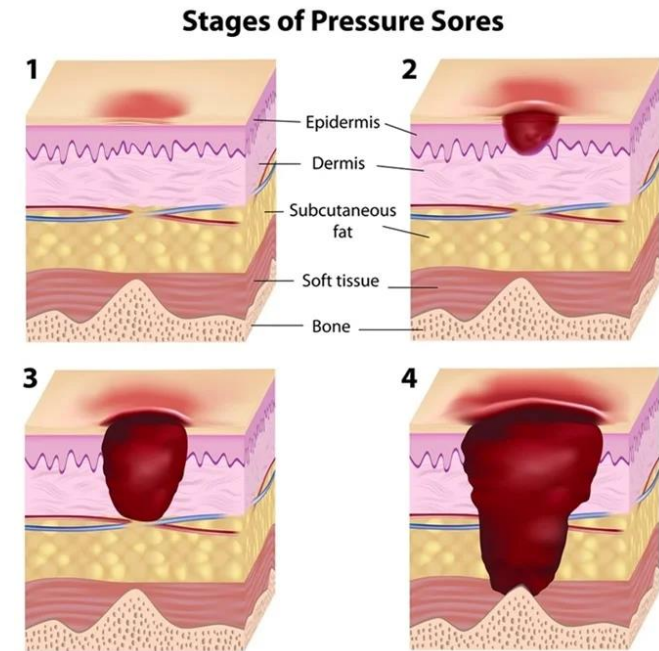
- This occurs between areas of bony protrusions and the chair

When this goes unaddressed pressure ulcers can form in the affected area

- These pressure ulcers put patients at risk for infections and affect their quality of life

Patients that have restricted feeling are at great risk

- This can be mitigated by the caregiver, but pressure ulcers still form



# Key Concepts

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## Heatmaps

- Graphical representation of data in a gradient of color

## Pressure map

- Specific heatmap of the measurement of pressure between two objects

## Bluetooth transmitter

- Device that allows a non-Bluetooth device to connect and share data via Bluetooth

## Bluetooth Low Energy

- Bluetooth with a lower power consumption

## Pulse Oximeter

- Device that measures a patient's oxygen saturation levels

# Objective

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Prevent the formation of pressure ulcers in disabled patients

Design and build an application that will read and display pressure sensor information

Allow easy accessibility for users

- Displayed in color blind formats
- Bluetooth low energy
  - Wireless
  - Power efficient

# Existing Solutions

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## Existing Options

- Body Pressure Measurement System - Tekscan
- ForSite SS – Xsensor
- MeasureX Pressure Mapping System – Blue Chip Medical Products
- BodiTrak2 Wireless IoT Pressure Mapping System

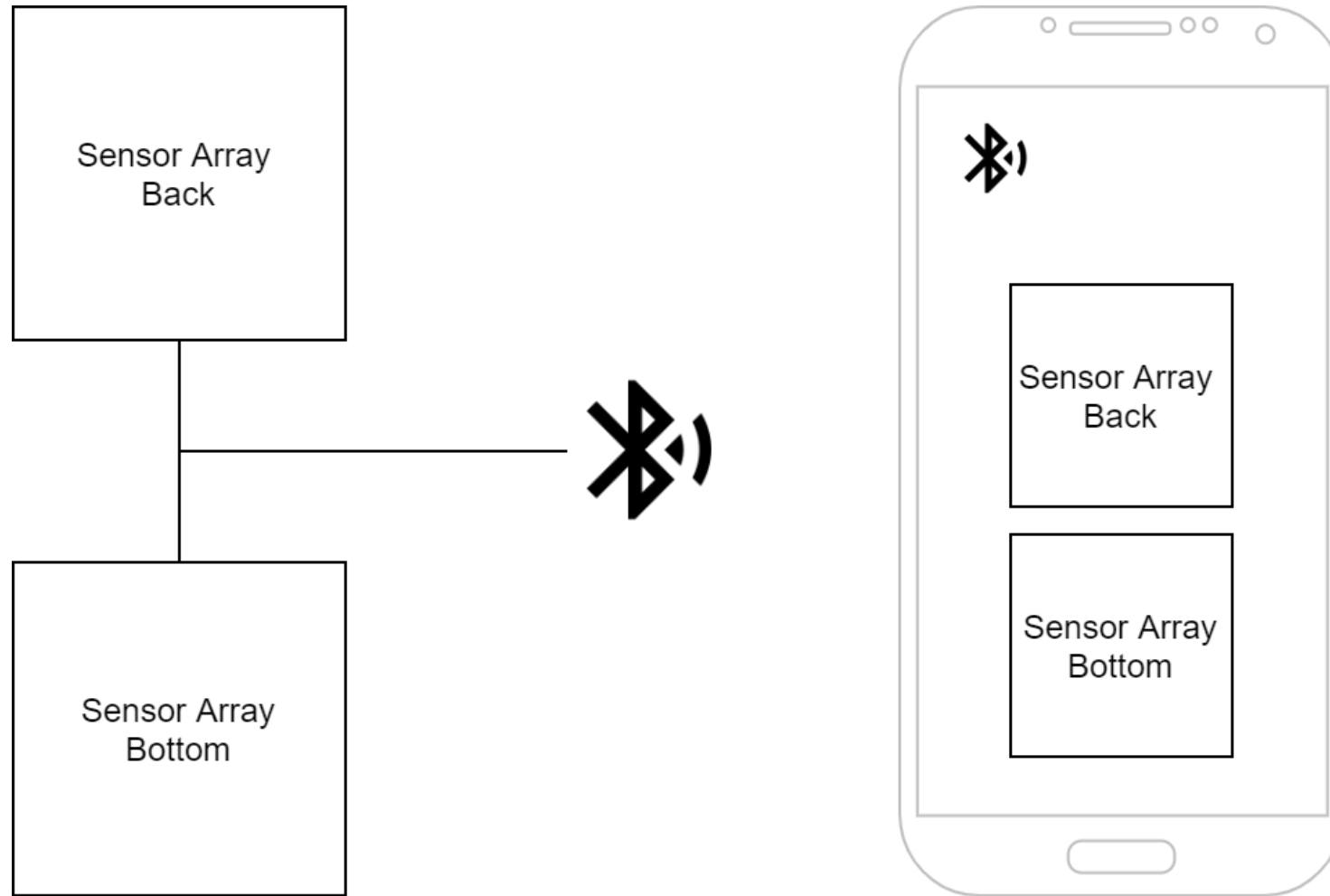
## How is ours different?

- Pulse Oximeter
- Cost

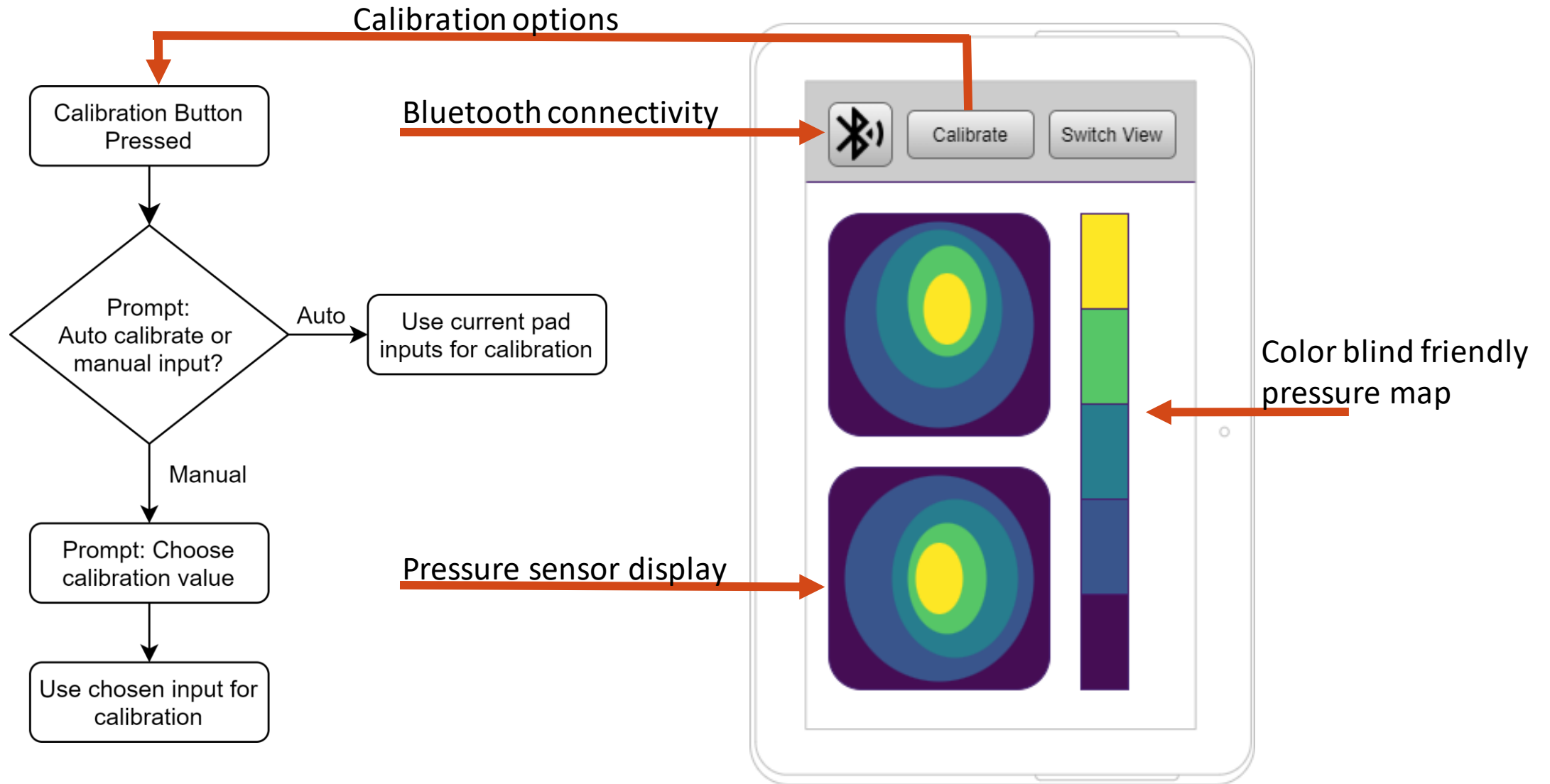


Xsensor ForSite SS mat

# Design



# Design Requirements



# Task Schedule

Tasks	Started by	Completed by
1. Verify requirements	November 1, 2021	November 15, 2021
2. Write final proposal report	November 15, 2021	November 28, 2021
3. Create team website	November 28, 2021	December 7, 2021
4. Create mock data of the sensor arrays	November 28, 2021	January 31, 2022
5. Build a prototype Android app with mock data	<b>January 1, 2021</b>	February 14, 2022
6. Create calibration logic	February 1, 2021	February 28, 2022
7. Pursue accessibility goals	February 1, 2021	March 14, 2022
8. Add Bluetooth connectivity	March 1, 2021	March 28, 2022
9. Gather feedback from all teams on application function	March 14, 2021	April 4, 2022
10. Implement required changes (if any)	March 14, 2021	April 18, 2022
11. Document all work	March 14, 2021	<b>April 25, 2022</b>



# Deliverables

Deliverable	Description
Design Document	Describes architecture of completed system, including hardware and application components.
Project Proposal	Archived proposal from Capstone I.
Project web site	Archived site from Capstone II.
<b>Android application source code</b>	Code, build files, and layout files needed to build and install the mobile application.
<b>Final Report</b>	Description of work completed, additional goals attained, outline of possible future work.