

# Seat Warmers: The New Responsive Furniture

## Problem:

You are interning for a start-up that is developing responsive seat cushions for perfect comfort while keeping warm at the Winter Games.

## Tools

\* FSR 2x, LED's, resistors, MCU, jumper cables, breadboard

## Goal:

- Drawing design, maybe mini cardboard prototype
- Use 2 FSR sensors to each cover half of the surface area.
- When someone is partially on the seat (when no one has been on it previously), the warming mechanism wakes up and warms slightly.
- When someone is completely on the seat, the warming mechanism kicks into higher gear/full-on warming.
- Once someone is on the seat completely and after some time.....If we notice someone shifting around for a few seconds, we then cool the warming mechanism 15 % below the max value.
- If someone is partially on the seat for a long period of time, we continually cool the temperature by 25%
  - until it reaches the minimum level of warming operation - 15%.
- If no one is on the seat, the warming turns off.
- Use an LED to stand for the heater. As it warms, pulse the LED in a breathe pattern. As it cools, the LED is a constant low illuminance level in short flashes.

## Methods:

- ☒ ~~We'll need to make use of thresholds, history, and peaks.~~

- ☑ We'll need to keep track of previous readings, as this tells us which edge of the action we are on.
- ☑ Are we on the starting edge, where the previous reading was below the threshold and the current reading is above the threshold?
- ☑ Or are we on the falling edge where the previous reading was above the threshold and the current reading is below the threshold?
- ☑ How much of a change was it since our last reading?
- ☑ Variable management is important here. Where are they used? When do they get a new value/are updated? Where are they compared? Think it through. Test it slowly.
- ☑ Use custom functions, variables and parameters.

Program flowchart:

