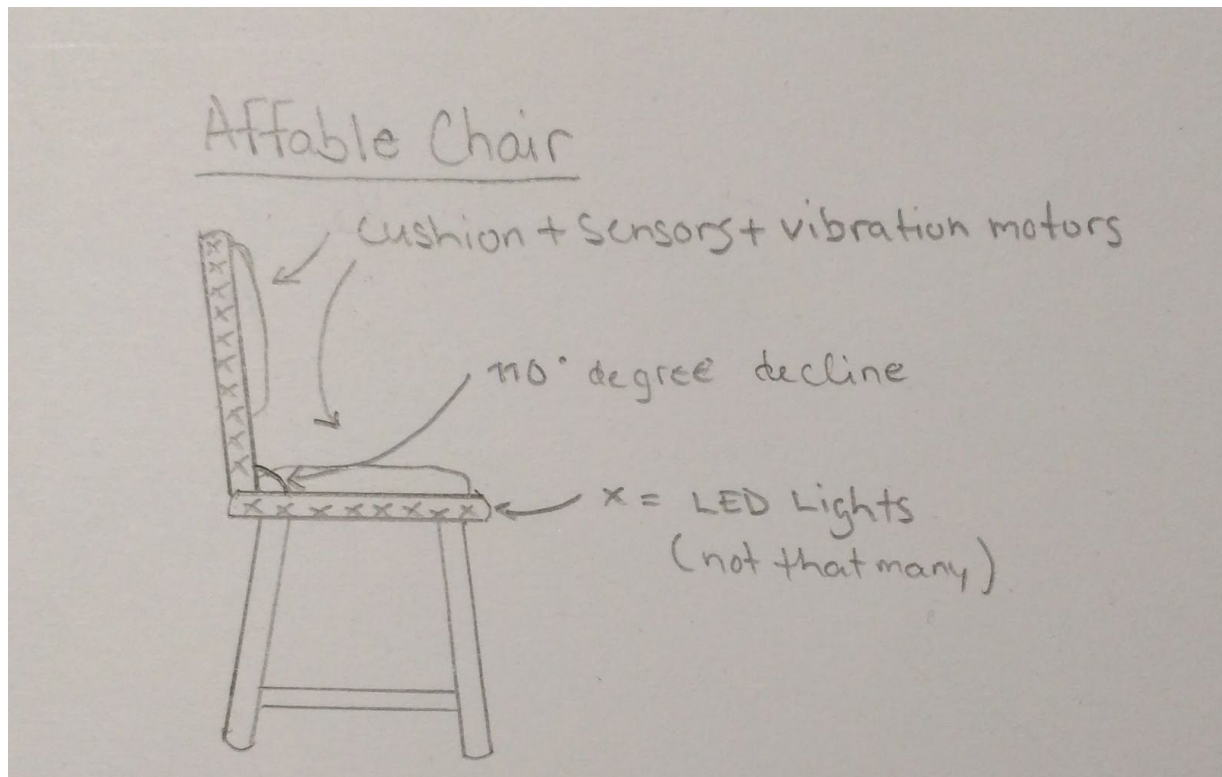Gerald Alvarez
CART 360
Project Proposal - The Affable Chair

Description

The theme of the is project is to invoke awareness of a proper posture when sitting and to enforce a routine of a small break by standing up for x amount of time after sitting for long duration of time. Essentially, the goal is to promote a healthy lifestyle for stationary people. For instance, Affable Chair is an excellent medium for Video Gamers; since, they lose awareness of time due to the immersive environment of a video game. This object will notify them to get up and get some stimulation for their dormant muscles. Also, this object will also be a benefactory for them due to the sitting posture prompt that helps good back structure, prevent back pain, and lessen fatigue due to long immobility. By utilizing this chair, they will, hopefully, realize the deterioration of their health and adapt a greater behavior. A comfortable chair or a "gaming chair" does not help nor improve a gamer's behavior and health quality, but the user's effort does. Affable Chair will help these gamers start a routine for an improvement in posture and health, and subsequently they will develop these habitudes naturally.

Input

The Affable Chair will utilize the pressure-sensitive conductive sheet (velostat). Four will be placed on the seat for accurate detection of the user's sitting pattern, and one or two on backrest for extra data to extend user's sitting pattern.

Output

The user will be prompt to stand up/fix posture through haptic feedback using vibration motors placed on the seat and backrest. Also, LED lights will also be place on the chair to give visual feedback if the user is not sitting on the chair or if it is ready to sit again. In addition, a bluetooth module will be integrate with an app that will send message to user's smartphone to give feedback concerning posture development and simply a message to really stand up.
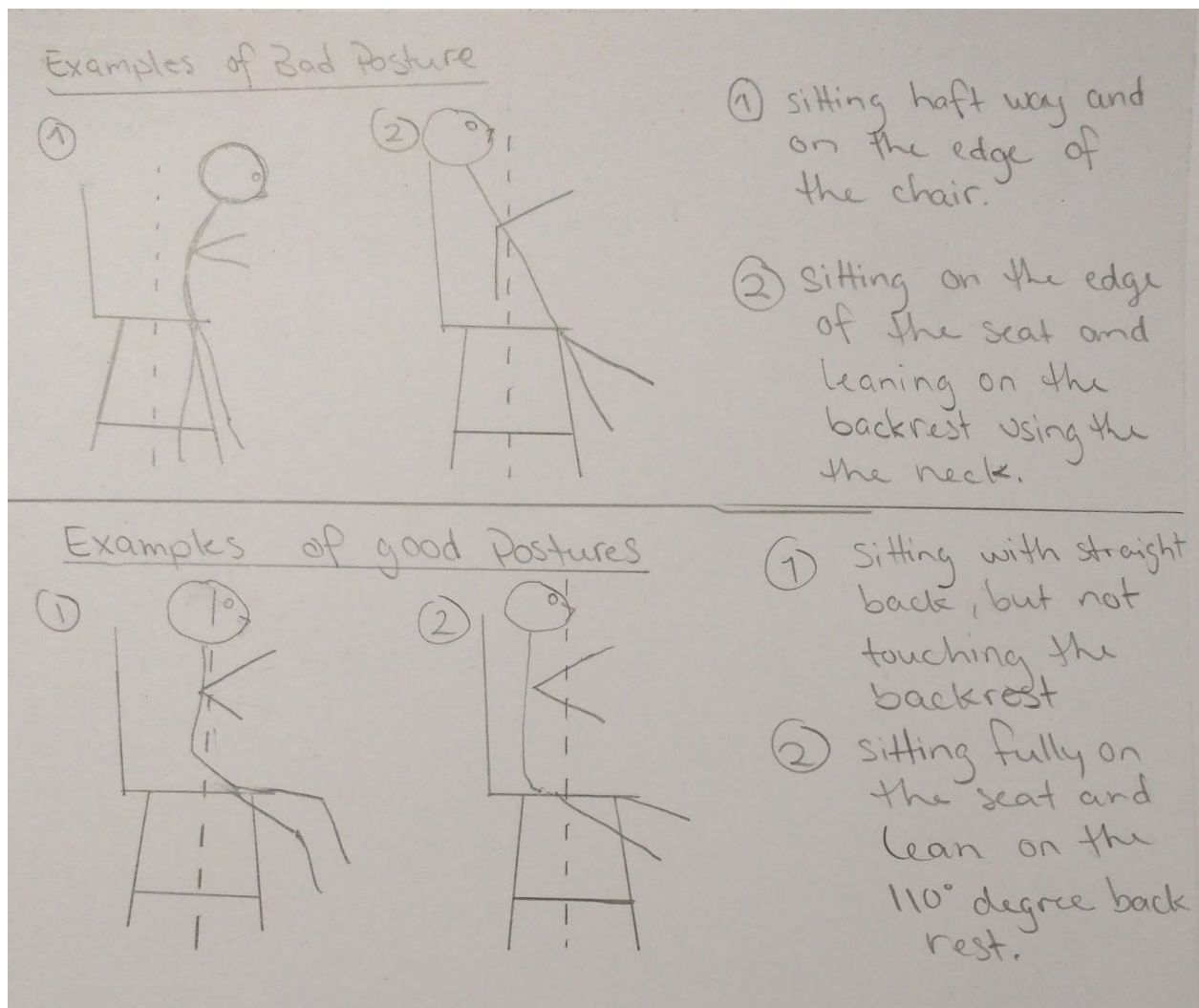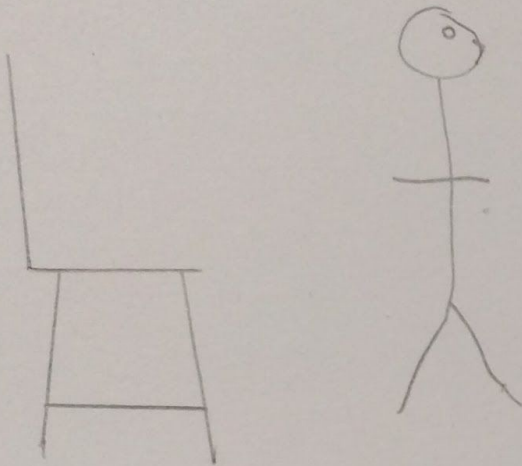
State: Get-up/take a break
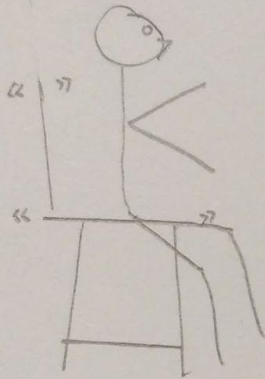
⮑ chair vibrates +
color LED light
illuminates.

- First, the chair
will notify the
user with three
different output.
  1) vibrate
  2) vibrate + LED light
     After x amount of
     time passed
  3) vibrate + LED light
     + Phone notification
     After x time passed

State: On break

⮑ Stop vibrating, but
Led lights blink
during on break

- During on break
the chair will
be on the state
of preventing the
user to sit back.

<u>Inspiration and Similar Projects</u>

Ergonomic Chair Using Arduino
https://create.arduino.cc/projecthub/monamohamed816/ergonomic-chair-using-arduino-81bb2f

This project transforms an ordinary chair into posture position checker whenever its user sits improperly. With the help of piezoelectronic sensor, it detects pressure if the user sits on the seat and leans on the backrest. Then whatever the result, the user is notified via a visual output using LED light and message notification on the android phone using the 1Sheeld. The project evaluates the two pressure sensors' state by setting a threshold. If the two sensors are greater than the threshold which states that the user is sitting properly. If one of the sensor (seat) is greater than the threshold and the other one (backrest) is less than the threshold, it states that the user sits without leaning on the backrest, but on the code it is considered improper posture. This project is not verifying much about the user's sitting pattern, and it only verifies the states of the pressure sensors which it does not mean much about the user's action. For instance, the user could be sitting straight on the seat without needing to touch the backrest. The creator of the Ergonomic Chair did not take account of the user's behaviors.

For my project, the idea of notifying the user of improper posture is one of the theme. Ergonomic Chair is a good inspiration for design in which takes account of user's input (whenever the user sit on the seat and lean on the backrest). In my opinion, it could have been better if the user's inputs are elaborated furthermore. For my project, I will be using five or six pressure sensors for user's input. These pressure sensors will sawed inside the cushion of the seat and backrest (four on the seat and one or two on the backseat) to receive multiple input and to process it for better understand the user's pattern of sitting.

Life Band - Health Assistant for Elderly
https://create.arduino.cc/projecthub/user06254/life-band-health-assistant-for-elderly-70e6f6?ref=tag&ref_id=bluetooth&offset=72

Life Band is a wearable tech that aims to help elderly people to monitor their health and to notify the user and/or the guardian if something terrible occurred. It has pulse sensor to observe the change in a heartbeat making it very crucial whenever the user is having a cardiac attack or simply if the user encountered a minor issue that could rise their pulse beat. It has temperature sensor to check the user's temperature which could be affected by environment or other variables that rise/lower the user's body heat. It has a barometric pressure sensor to observe if the user had a sudden accident such as falling down. And lastly it has bluetooth module to get all these data and send it via smartphone which an app (Blynk) processes and displays it.

This project might not be similar to the project of mine; however, it has the concept of transmitting the input data and sending it to a smartphone in which it is informative about the user health and condition. But in my project, the user is not any in risk, however, a friendly

reminder from the Affable Chair could send a message to the user's smartphone to get up and move his body, and see the progression of his sitting pattern over the time.

LazyMax 1000: Arduino Phototransistor and Haptics Project
https://diyhacking.com/lazymax-1000-arduino-phototransistor-haptics-project/

The project started due to the comfortable rolling chair that made the user lazy to get up. In this context, the creator was inspired to make a device that will prompt the sitter to stand up after ten minutes. Basically, a small device is hooked on the backrest recliner of the chair that has a phototransistor that detects light. Simply whenever a user sits on the chair, light will be blocked by the user's back and the light sensor will send a data to the microcontroller and set a timer for the haptic motor that gets trigger in ten minutes to inform the user to stand up.

The project's theme is very similar to mine: the idea of prompting the user to stand up for a health benefit. However, my idea is also to enforce a routine that the user will incorporate it later without the Affable Chair. In addition, the phototransistor is a good choice to be mounted on the backrest. But in my project, I wanted the seat to receive the user's sitting pattern and I believe that using four phototransistors will the experience uncomfortable for the user to sit on. Hence, velostat is the best solution due to their paper-like thinness and is sawable with the other conductive materials to construct a cushion with built in pressure sensors.