

HEALTHY POSTURE : CONNECTED CHAIR CUSHION



Back pain: the pain of the century

76% of office workers suffer from back pains, a phenomenon affecting more and more young people, as now 71% of them have back problems.

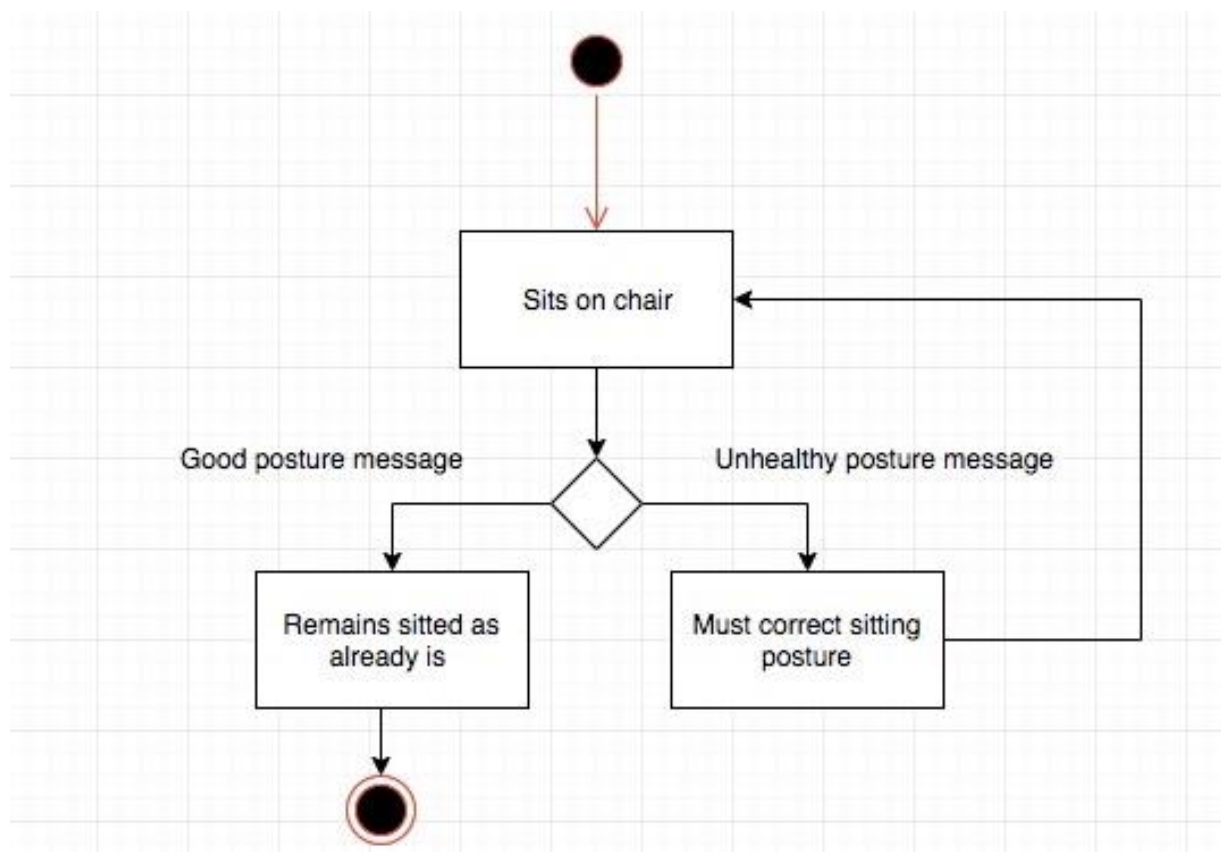
With Good Posture and its state-of-the-art technology, try to avoid or reduce your backaches and let any feeling of sitting discomfort disappear.

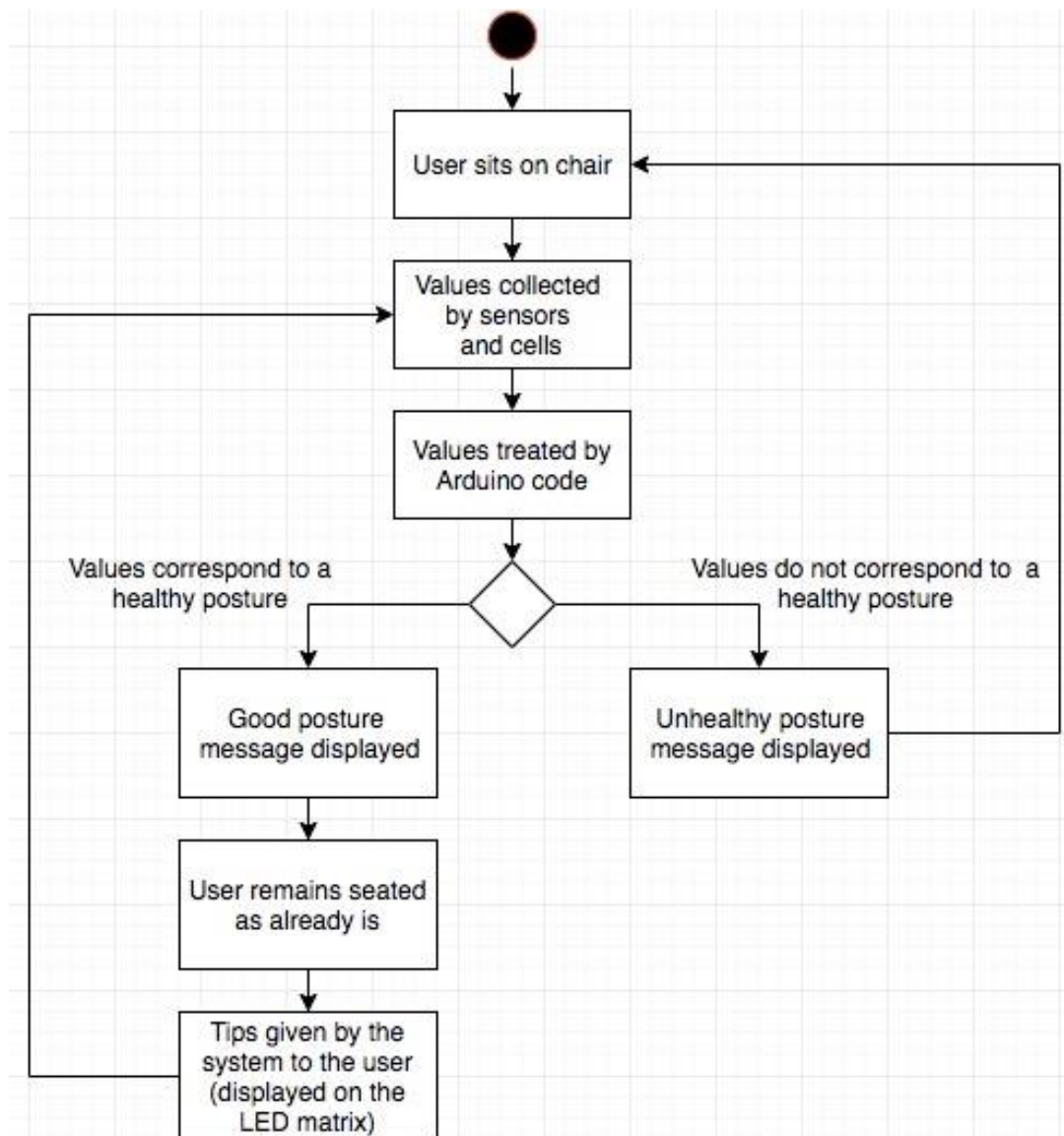
Table des matières

<i>I. Healthy Posture, connected chair cushion: explanation of the concept.....</i>	<i>3</i>
<i>II. Technology structure and project planning.....</i>	<i>7</i>

I. Healthy Posture, connected chair cushion: explanation of the concept

Backache is a common and a widely spread pain that can grow into a burden if neglected or treated carelessly. As a major part of the population has felt this pain at least once in their lifetime, we have in front of us a blooming market. That is why we came with the idea of a Healthy Posture, a connected chair to adopt a healthy sitting position addressed for teenagers to seniors. The following diagrams describes rapidly the operation of our system.

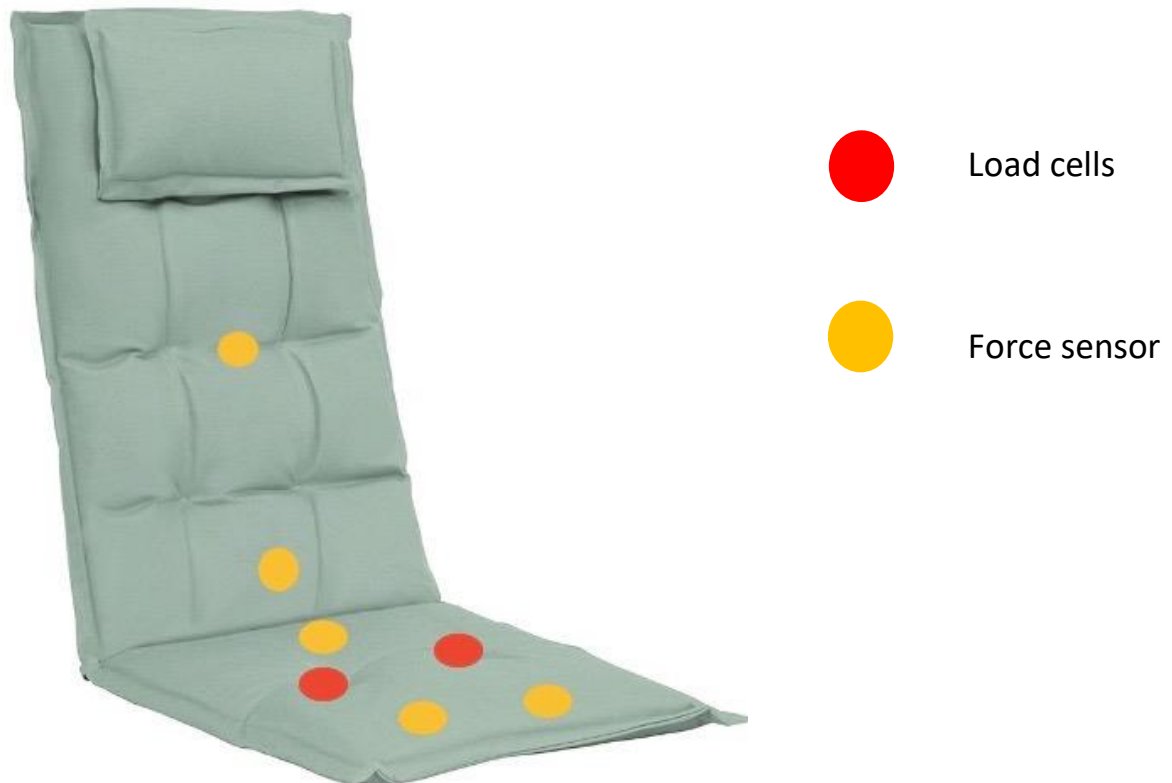




We aim to create a chair cushion in which there would be load cells and force sensors connected to an Arduino card. The values collected by the cells and sensors and treated with an Arduino code, will determine if the user is sat correctly or not on the chair.

To determine if the user has a healthy sitting posture we intend to proceed as follows: the values collected with one load cell will be compared with the values collected by the other load cell. If this set of values matches, then the user applies the same pressure on both sides and if each of the force sensors

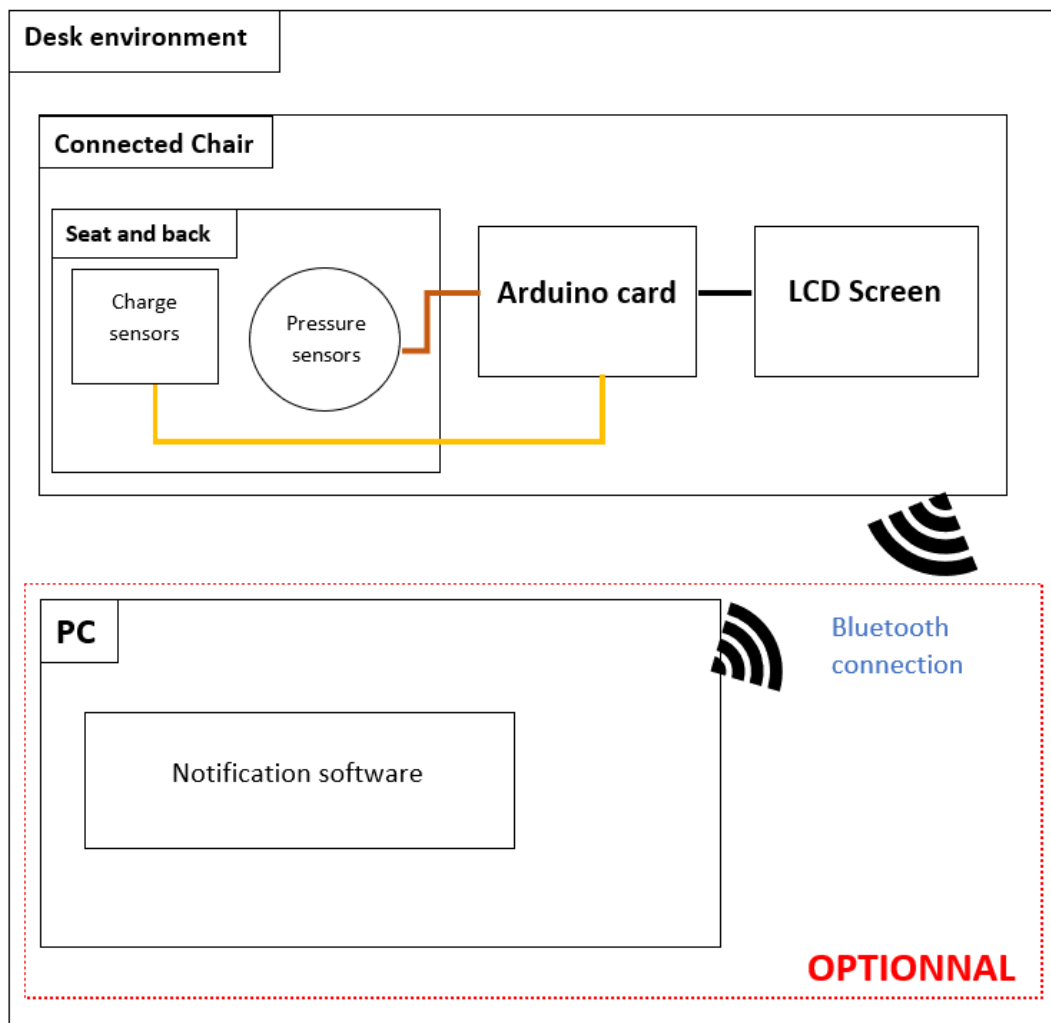
detects a presence, then the user has a healthy posture. (These two conditions are necessary to validate the posture).



To communicate with the user, to indicate him/her about him/her posture we aim to display messages either on a LCD screen or on the user's computer screen via Bluetooth. There will be several degrees of warning messages, as not every and all possible postures have the same effects on our health. For example, crossing legs is not as unhealthy as being slouched on the chair. Therefore, following the posture the user has, warning messages or simple advices will be displayed on the LED matrix. Moreover, the Healthy Posture will give tips from time to time to the user: from time to time, the system will remind the user to take mini breaks or to do simple stretching exercises.

The following global schema resumes our project :

GLOBAL SCHEMA OF THE CONNECTED CHAIR



NB : The Bluetooth connection with the PC is optional as we can display informations thanks to the LCD screen.

II. Technology structure and project planning

- LCD Screen MC21605C6W-BNMLWI-V2 - LCD alphanumérique, 16 x 2, White on bleu, 5V, I2C

https://fr.farnell.com/midas/mc21605c6w-bnmlwi-v2/afficheur-alphanumerique-16x2/dp/2748649?gclid=Cj0KCQiAiNnuBRD3ARIsAM8KmlurhpO7j8kCDdS--lenEo8lgp-RW-XD1eKwfATqO5GZP9nHVcUm7ecaAg5VEALw_wcB&gross_price=true&mckv=rELjvcZk_dc|pcrid|80993882222|&CMP=KNC-GFR-GEN-SHOPPING-2748649

- Jumper wires males and females
- Resistors (Ohm value still to be determined)
- Force captors : 4x petit devant , 1bas dos , 1 bas siege
- Load cells : 2x TEM01052B

<https://www.gotronic.fr/art-capteur-de-force-fsr400-21742.htm>

https://www.generationrobots.com/fr/401944-capteur-de-poids.html?fbclid=IwAR0IzleXWvTWX7FC9_w8Ukq5Pop33e_fqit5KbMOv81uRGhorTwphE5utZ4

- Yun Arduino card (to be confirmed): The Arduino Yun card is an Arduino board, but with some additional advanced features to help create connected objects prototypes. Whereas Arduino Uno (basic Arduino boards) connects captors and enables a communication with each oether or with a computer, the Arduino Yun card has the great advantage of a direct communication, wired or wifi, with a local network or with the Internet.

- ESP8266 WIFI module <https://www.gotronic.fr/art-module-wifi-serie-esp8266-113990084-23666.html>
- Lipo battery 7.4 V - 2200 mAh - Arduino jack socket <https://boutique.3sigma.fr/alimentations/14-batterie-lipo-74-v-2200-mah-connecteur-jack-arduino.html>
- Chair cushion

