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CART 360 - Section AA

PROPOSAL “THIS = THEN = THAT”

Research questions

This new interactive garment is made for the outdoors, and it is made to encourage physical activity. Keeping active while balancing your life can be difficult and overwhelming. It takes a certain determination and perseverance to stay motivated so that you include exercise in your daily routine. An even more difficult challenge is to stay active during the cold winter months. The below freezing temperatures are another excuse we give ourselves to not exercise. In these periods of hibernation and isolation, we need to find creative ways to stay healthy.

My project will be presented outdoors, preferably in the woods. As a Montréalais, the ideal spot would be on the top of Mont-Royal either at the look out or around beaver lake. It will be in nature where I think this project will be the most beneficial for the user. I also prefer nature because of its calming and relaxing qualities. The project encourages you to explore and move in spaces that are bigger than your usual surroundings. Especially if you live a sedentary lifestyle.

This garment is for people who want to get moving. I am doing this project mainly for myself to increase my winter activity level. Conceptually, this garment could be worn by others which would take advantage of the integrated communication system allowing them to send signals to each other. This would make exercising more fun and would encourage people to exercise in small groups.

I want to make an interactive jacket for winter jogging. I would take a pre-existing coat and modify it to make it interactive. When the user wears this jacket, it will respond to their level of activity. The garment will give feedback when the user achieves a certain goal and when their heart rate increases. The relationship between the user and the jacket will be personal as the coat is directly connected to their body and responds to their movements. If the garment is worn by others, users will be able to send signals between themselves. This may encourage people to workout together.

The coat will promote physical activity. By wearing it, they will have an increased awareness of their activity level. Because of low visibility in winter, the jacket will have multiple RGB LEDs. Not only do these LEDs ensure better visibility, they also get people's attention. I think people would be curious. If I saw someone with LEDs flashing on their coat, I would want to know more about it. I would even be inclined to talk to them and to start a conversation with them about their garment. I think this project will affect my own health in a positive way, but may also inspire others.

Jogging has numerous health benefits, so by using this interactive wearable, I think it could increase my motivation to keep me active during the cold winters. Having a coat that visualises your activity is a nice way that will increase the amount of times you wear it. Thus, incrementing your daily activity. When I started jogging this summer, I was very inspired by people around me. I did not feel like I was being judged while I was completely out of breath trying to build cardio. It was something unexpected, yet encouraging. I hope that this interactive garment will have a similar response. Incorporating technology into exercise equipment is a great way to make people use it more often, especially for tech savvy people like myself.

I struggle a lot with exercise, even more so in winter. It is not something I particularly like doing. Throughout my childhood, I felt forced to do it which led me to hate it even more. In Cégep, I thought I would force myself to like exercising by enrolling in strength training classes and circuit training programs. I hated every single session. My grades were my only motivation. I did not know what to do next, so I abandoned all attempts to exercise and gave up. I did not know how to build a healthy relationship with exercise. I could not see how that could ever change.

This summer, I hiked up Mont-Royal with some work colleagues for a barbecue, and it made me realize that I was in horrible shape. Climbing those stairs was exhausting. I could barely take a normal breath. It was a humbling experience, but I saw an opportunity to improve. I had regained a bit of hope. For the next month, I climbed those stairs four to five times a week. I even started to enjoy it. I had a challenge that I knew I could conquer.

One day, I decided to go for a walk in the woods, and miraculously I started jogging. I was shocked because this was the sport I probably hated the most. The one where in high school, I would faint in the woods because I would try to keep up with the others but was always far behind. Ironically, today I am really starting to enjoy it. This did not happen overnight. It was a slow and sometimes painful process to

start building cardio from scratch, but I am very happy that I did it. I asked myself, how could I continue exercising during winter? I thought I would try winter jogging. That's why I want to build an interactive coat that would allow me to stay motivated to exercise during this upcoming season.

A Non-Technical Evaluation of Sensors

This garment uses four sensors: a pressure-sensitive conductive sheet, a wireless heart rate sensor, a GPS and a Bluetooth signaling device.

By tapping the pressure-sensitive conductive sheet located near your chest area, you will output a signal in morse code that can be received by others wearing the garment over Bluetooth. Once other people, in close proximity, receive your signal, LEDs on their jacket start blinking and a mini disk motor starts vibrating letting them know your signal.

When your heart rate is low, the LEDs will pulse blue. When your heart rate is high, the LEDs will pulse red. The LEDs will be located around the collar, on the pockets and on one of the user's arms using a neopixel ring. The wireless heart rate sensor allows you to adjust it without it being attached to any wires that would be connected to your jacket. As your heart rate increases, the LED's will gradually change colour going from blue to purple to pink and finally to red. The colour will be related to the number of heart beats per second.

A GPS located on your arm will calculate your speed based on your position and time. The garment will keep track of the average speed and visually represent your current speed by using a 16 LED neopixel ring. The sequence of lights will flash faster as your speed increases. In addition to tracking your speed, the GPS will also keep track of your distance. You will get visual feedback for every kilometer you jog.

Interaction Design Strategy - Storyboard

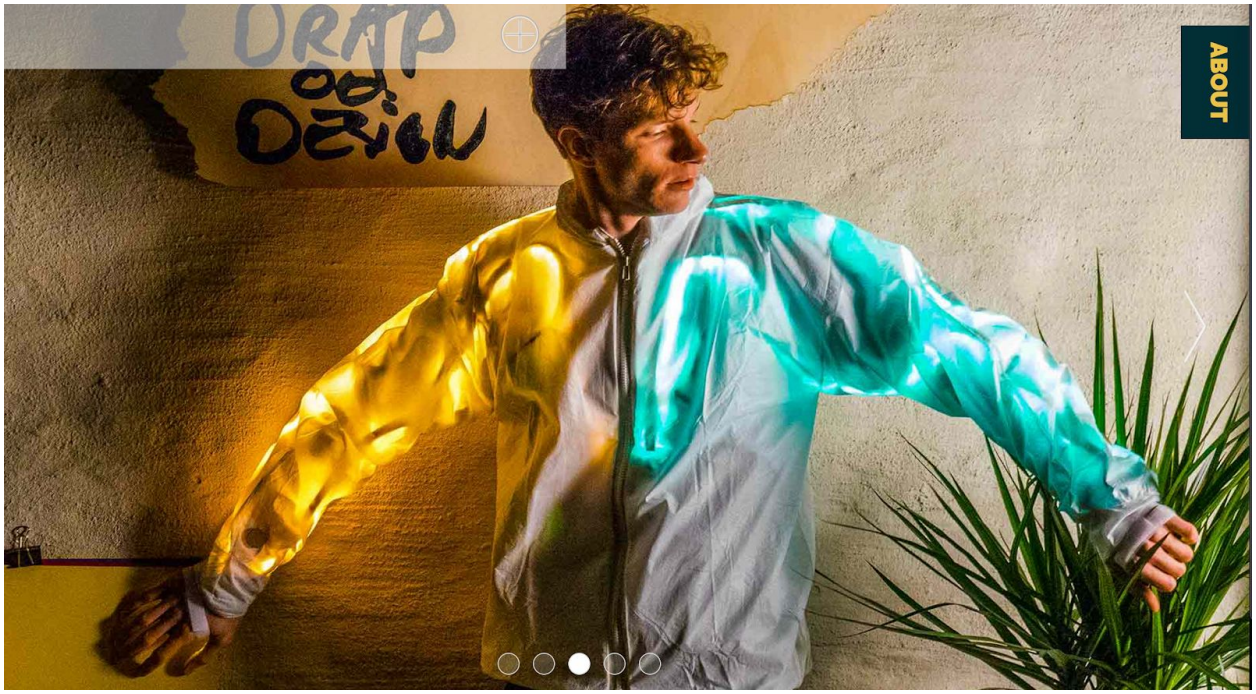
Similar projects

Mountain Safety Jacket: Movement Sensitive LED Jacket

The coat lights up and flashes when you stop moving for more than 15 minutes in case you fall and become unconscious while hiking in the mountains. It then allows you to be visible by rescuers. It has an adjustable headlight integrated into the hood of the coat which users can control its intensity. It is made with the Adafruit FLORA board and uses FLORA Pixel LED strips to control the lights that are on the hood and on the wristband. To detect inactivity, it simply uses a tilt switch and a timer that triggers the lights to flash if the tilt switch has not been tilted for more than 15 minutes. I find this a great idea for staying safe while exploring the outdoors because even if you are careful, an accident can put you in a lot of danger. The flashing lights are a nice idea, but it could be improved by actually sending out a distress call, maybe an SOS signal using morse code.

Source: https://www.instructables.com/id/Mountain-Safety-Jacket-Movement-Sensitive-LED-Jack/

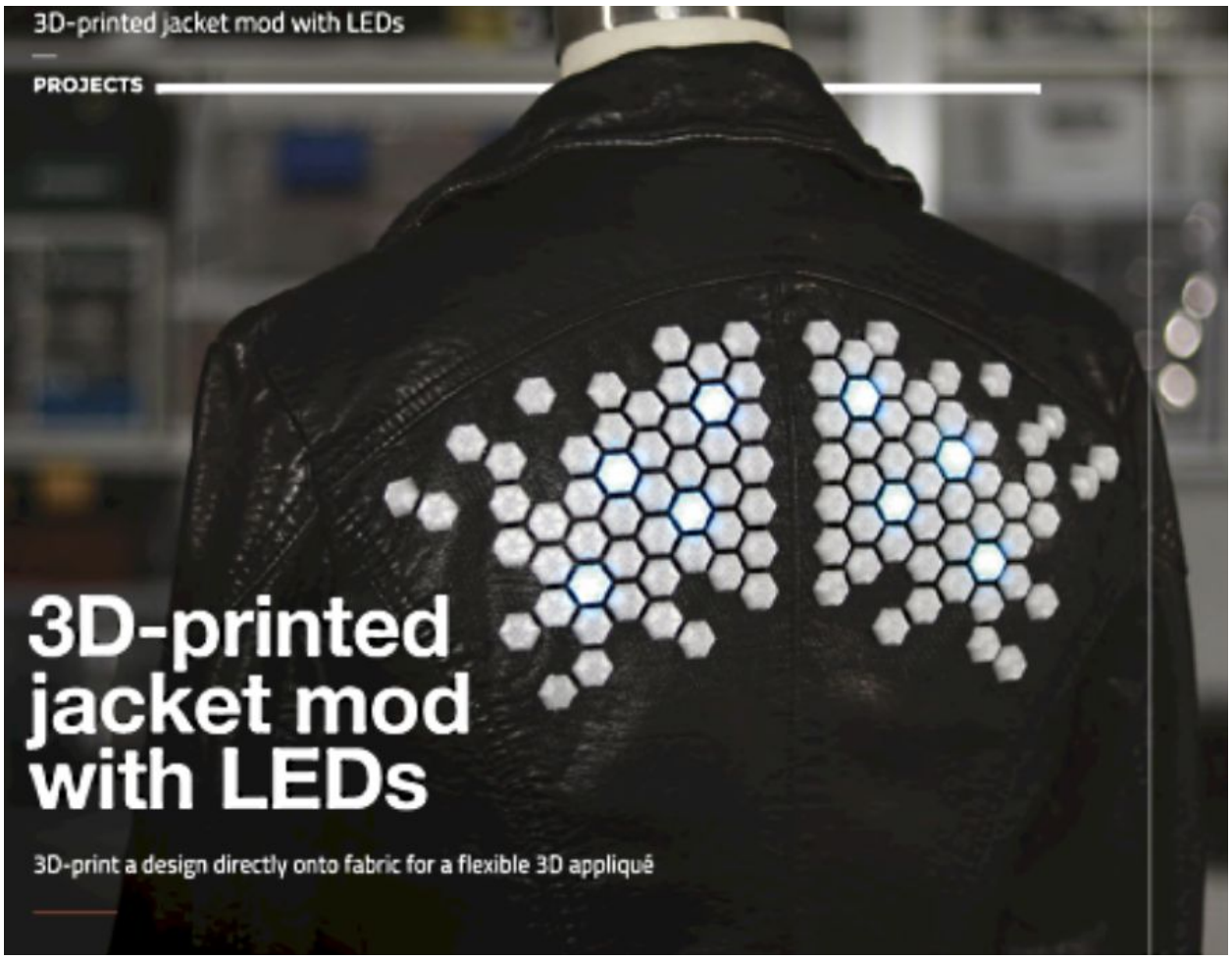
Interacket



Created by Drap og Design, a small design studio located in Oslo. Anders, Per-Johan, Simon and Sven Håkon created an interactive jacket that changes colour when you touch something with your hands. For example, if you touch something yellow with your right hand, then the right side of your jacket will light up in yellow. If you touch something green with your left hand, then the left side of your jacket will light

up in green. They created a chameleon jacket that interacts with the environment around you while wearing the jacket. I find this project interesting because it interacts with your surroundings in a unique way as it connects the user to its environment through colour. You first touch a physical object, then it scans that object's colour and then display it with LED stips. I also like how they used the jacket to disperse the light. It has a more organic look to it. I am assuming they used a type of colour sensor to detect the colours, and I am surprised how well it worked.
Source: http://www.drapogdesign.com/#whoWhere

3D-printed jacket mod with LEDs



This is more of a fashion piece as it does not have any specific interaction, but I like that they used 3D-printed hexagons to disperse the light. Made by Sophy Wong, this jacket lights up in the back and it has a honeycomb pattern. It was made using an Adafruit Circuit Playground Express. It incorporates 3D printing into wearables. It got me thinking about ways I could maybe disperse light with my garment.

Sophy Wong makes a variety of interactive garments ranging from a pair of NFC reader cufflinks to a bird hoodie that is a controller for the game Flappy Bird. Most of her interactive projects use the body's motion as the primary source of input.

Source: https://blog.adafruit.com/2019/05/03/issue-18-hackspace-magazine-3d-printed-jacket-mod-with-leds-by-sophywong-wearables-circuitplaygroundexpress-adafruit-hackspacemag-adafruit-msmakecode/

Source: https://sophywong.com/interactive

Why my project will be different

My project will be different because not only does it keep you visible and keep track of your activity, it has the potential to motivate me and others to exercise. Other interactive coats that exist have functionalities that help you find your destination using GPS, or keeping you warm with heating pads. Some garments also interact with their environment, but most of them are just made to show off as their only purpose is to have a "cool factor." Indeed, I want my project to look nice and even be a bit flashy, but to make it more interesting I want their to be a deeper interactive experience.

That is one reason why I want to integrate a communication system within my garment to either make it possible to communicate with other garments or other people's smartphones. As the goal of this wearable is to keep you motivated and to keep you moving, it can also be compared to fitness trackers like the Apple watch, the Fitbit trackers, etc. However, these devices are less visible on the body, making them more personal and less motivational to others. I think the combination of the signal transmission, the heart rate monitoring and activity tracking creates a unique and creative idea for an interactive wearable.