

NEWBIRTH – My journey

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Introduction:

Concept: Women's bodies are often widely discussed on social media. Society often has some underlying standards for women's bodies, such as thinness, muscle, and curves. Especially in some Asian countries such as China, South Korea, and Japan. Most women choose to have a baby, but most women who do want to get back in shape immediately after giving birth. On some popular online shopping platforms, postpartum girdles have seen high sales. The postpartum lap band has a medical function for women who have undergone childbirth, such as fixing the organs after childbirth. But the social media hype around the postnatal corset is more about getting back into shape faster. Obviously, women who have given birth are somewhat attracted to the restorative benefits of the post-partum band. The extent to which women are concerned about their midriffs can also be seen in recent fashion trends, where fishbone waist cinches and waist tucks are used in various fashion combinations. I try to explore the relationship between body shape and beauty for women through this work. I wanted to design a waist vest that would be suitable for women of all sizes, and each type of woman would have its own unique style. Maybe it's cooler for people with bodies that society defines as imperfect.

Input: *Ultrasonic sensor / Touch Sensor*

Output: *180-degree Servo / RGB LEG light ring / Buzzer*

Week5 Inspiration & Research



Fig. Inspiration Board

This work was inspired by the girdle of the female waist. The waist girdle can be roughly classified into two types on mainstream shopping platforms: the postpartum girdle for women with medical significance, and the waist girdle clothing that highlights the role of decoration and body shape. As a woman, I am often guided by mainstream fashion trends. When more and more brands and

businesses start to sell waist sealing clothes, I will have doubts about my body and lack of confidence. I may even subconsciously want to lose weight and shape up to dress better, even though I may not be obese or unhealthy.

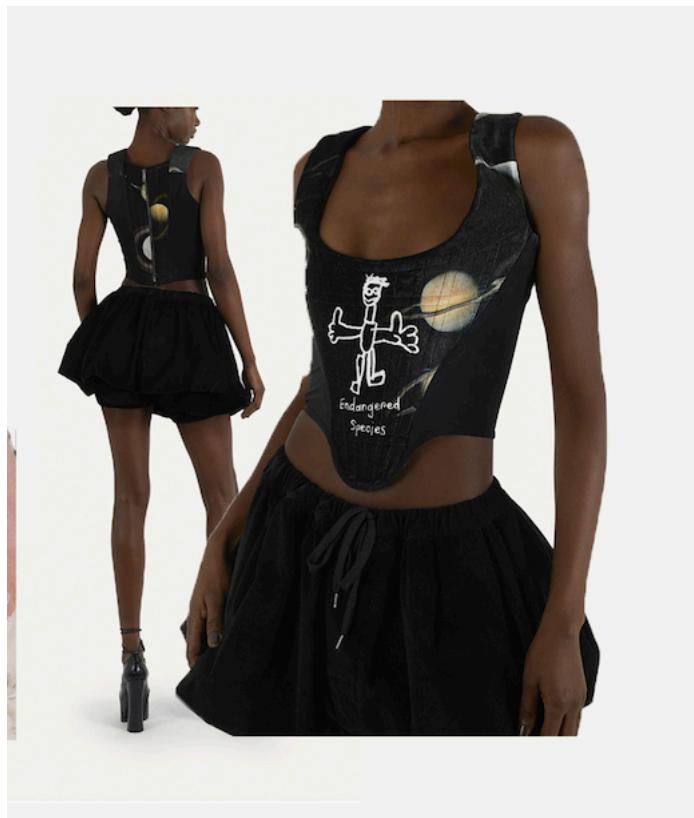


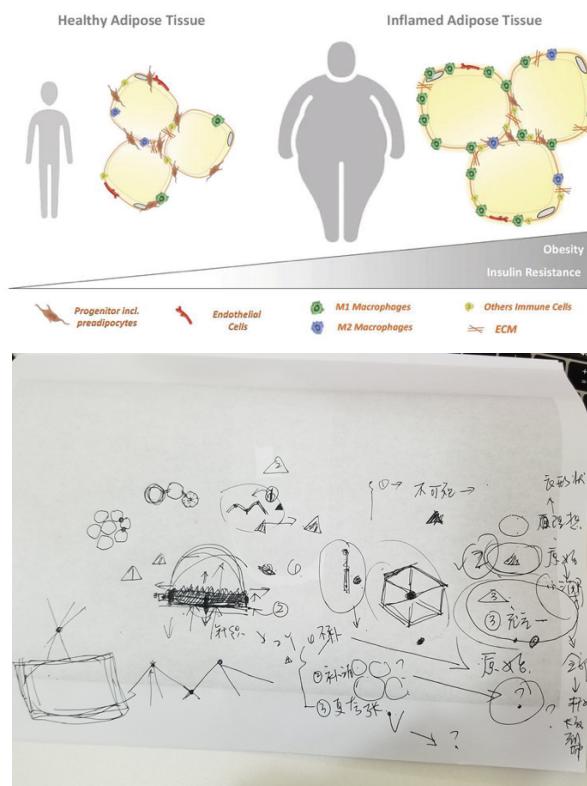
Fig. The "fishbone" element of fashion

Armor is another source of inspiration for me. Armor was a symbol of masculinity, strength, and power in ancient feudal China. In ancient Chinese society, there was a tacit rule that men needed to earn money to support the family and protect the country, while women needed to have children, take care of the elderly, and run the house. But there are also Chinese stories like Hua Mulan, who disguised herself as a boy to join the army for her father and brother. So, women wearing armor can be seen as an act to break gender prejudice and fight for gender rights. This work hopes to encourage women to break the social default of traditional female body standards and express the unique beauty of women, which is highly overlapped with the implied meaning of armor in gender rights, so armor is an important expression of my work.



Fig. Ancient Chinese armor

My main topic was the female figure, so I studied the main physiological process of weight gain, which is the differentiation and division of fat cells, and tried to get a movable structure out of it to simulate the process of weight gain. One research on "Negative Poisson's Ratio Structure" has given me a great inspiration. I finally decided to use a negative Poisson's ratio structure that can expand and contract as the fabric structure of the device. It is the fabric structure that best fits the process of human fat cell division and growth that I have found, and its dynamic changes can make people's body shape more exaggerated. By enlarging women's imperfect body parts, but still with cool visual effects to inspire women who have a bit of belly fat after giving birth.



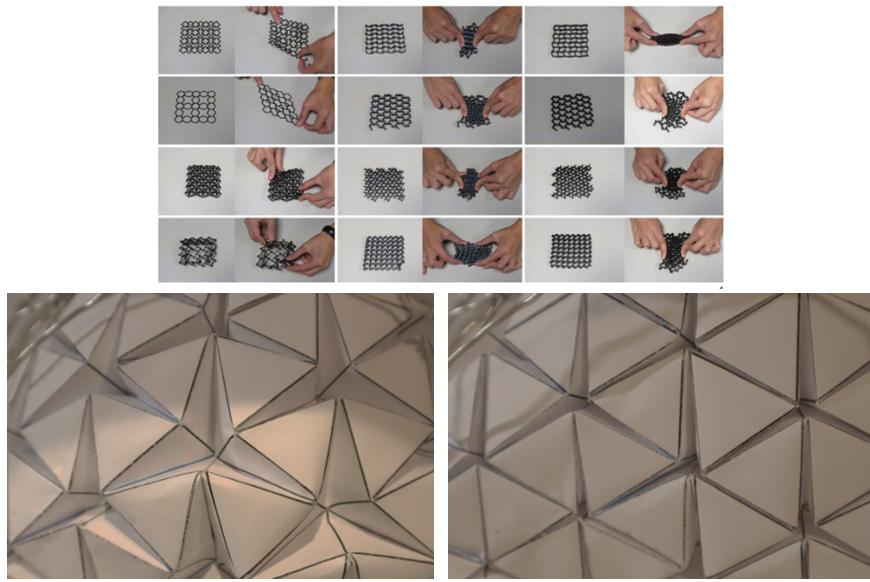


Fig. Study on structure

Week6 Shape design & Interaction Design

Device appearance design:

This project is an interactive wearable device in which I try to make the belly of an obese woman more exaggerated.

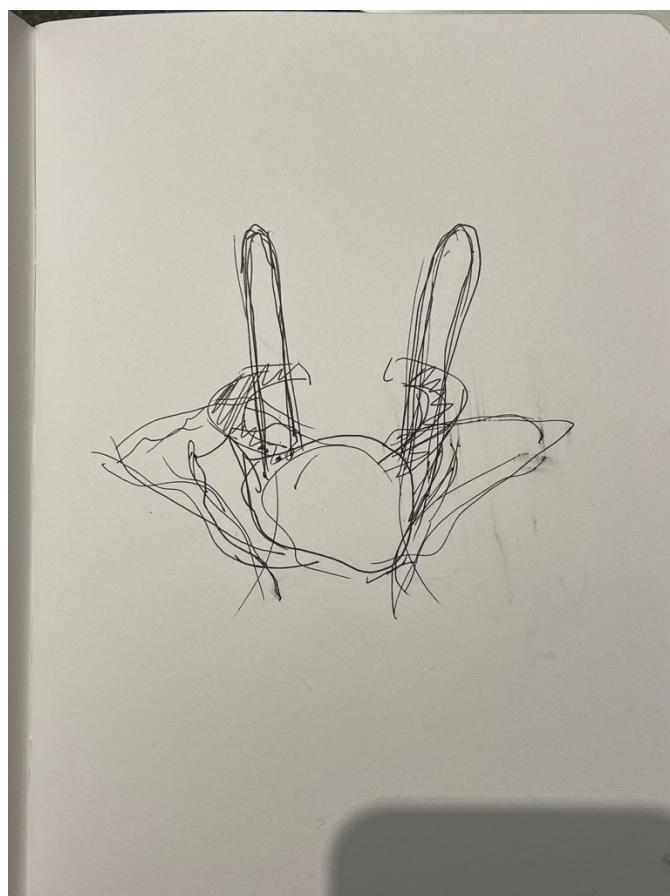


Fig. Sketch

I did a 3D model based on the sketch. I started by superimposing a model of a fat female body on a model of a normal-sized female body. Then I cut the fat part of the abdomen separately and designed the shape of the deformed ribs on both sides. The ribs on the sides were designed to simulate the distortion of the ribs caused by prolonged wearing of tight waist corsets (the irreversible damage caused by tight fishbone corsets in medieval Europe).

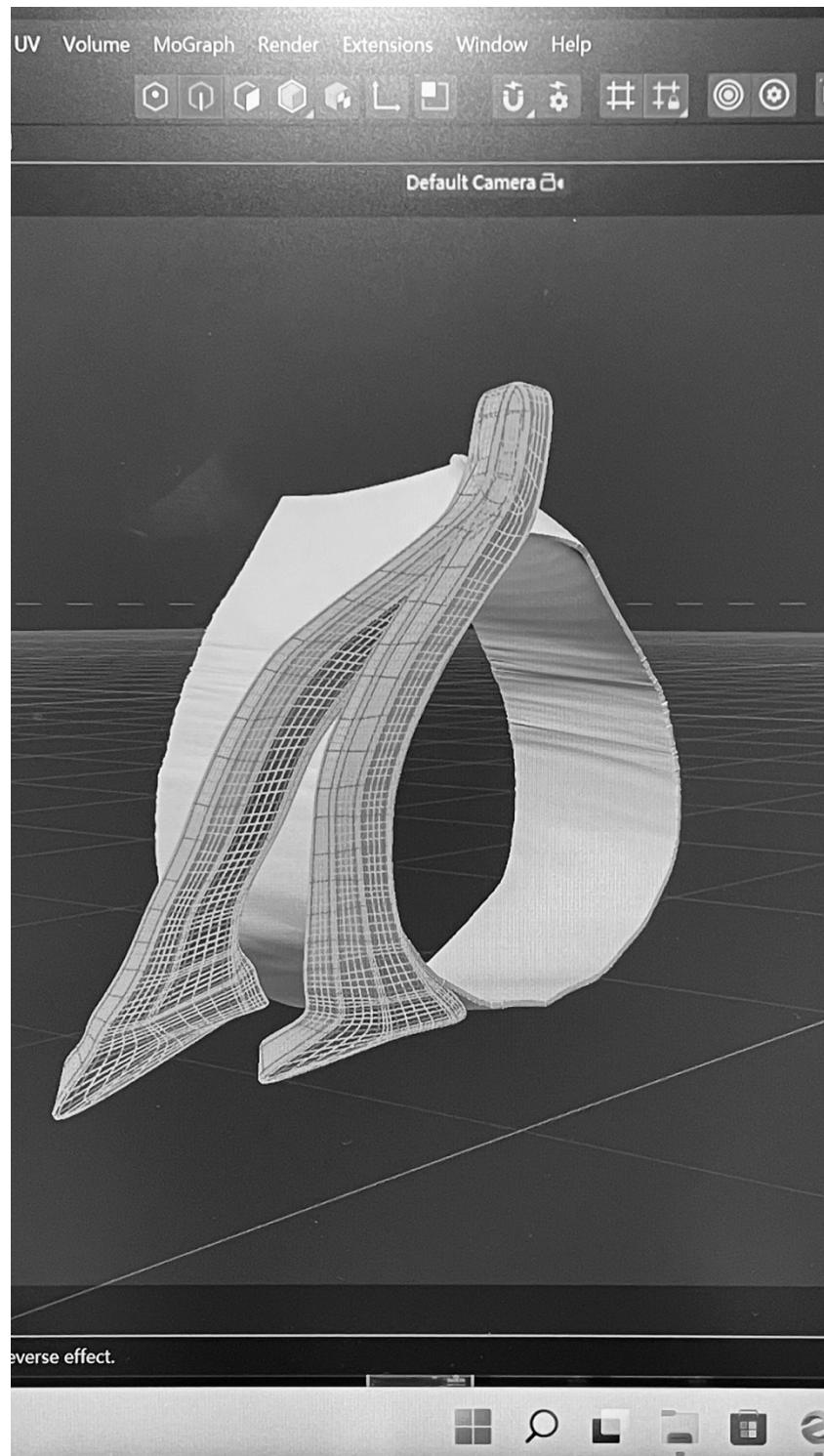


Fig. 3D Model (C4D)

Interaction Design

This week I designed the interactive flow of the project. This project focuses on the uniqueness of female beauty and the standard of female figure. This installation hopes that women can think about their own figure and others' perception of their figure during the experience of the installation.

The original design of this device is to control a push rod structure through touch sensor to make the fabric with negative Poisson's ratio produce the motion effect of breathing state and use ultrasonic sensor to sense the distance between the person and the device and produce different lighting effects.

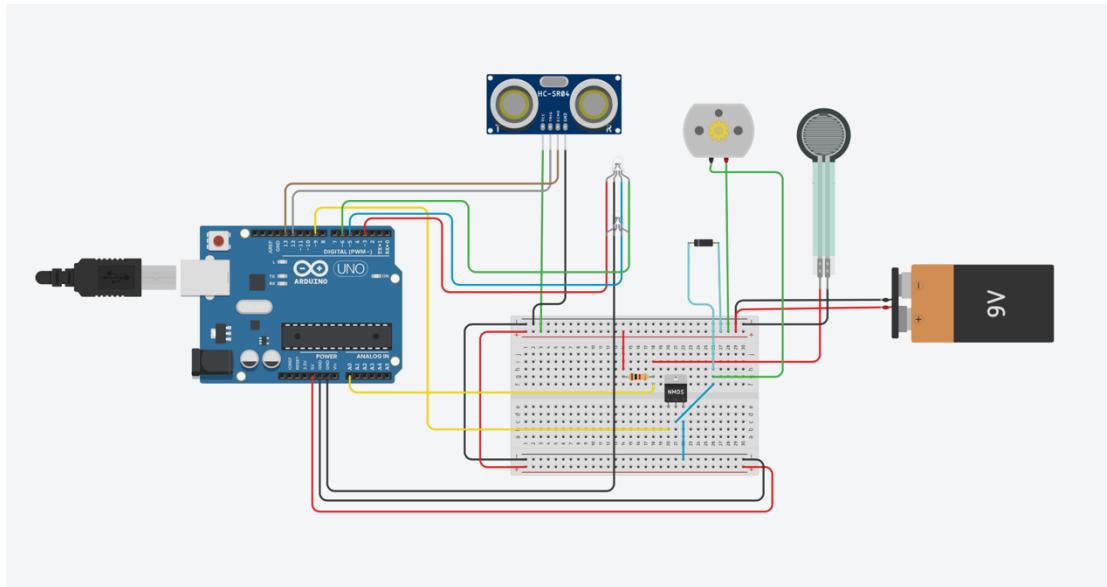


Fig. Circuit Design (version.1)

I first considered using an electric push rod to control the movement of the fabric structure, but due to the limited thickness of the designed shape, it is impossible to place an electric push rod in the device. Secondly, I consider using balloons to control the movement of fabric structure but considering that the movement direction of the balloon is to the four sides, if I place the balloon in a narrow space fixed on one side, it is easy to make the balloon explode. So, in the end I chose to design my own pushrod structure to fit the size of the device, but I also continued to explore the use of airbags.

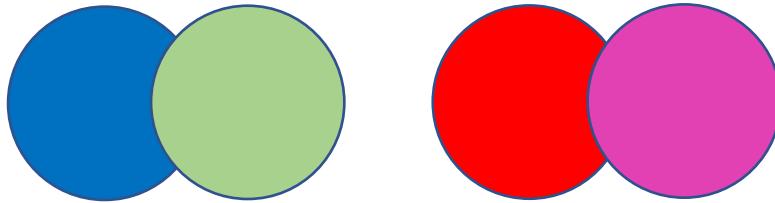


Fig. Push rod structure demo

Video Link: <https://youtu.be/WpHiDCgSq1Y>

Lighting color design

I chose blue and red with gender symbols as the main colors. In everyday life, blue tends to represent men and red women. But I use the two colors in reverse. I imagined the installation itself as a female, with lights flashing alternately red and pink when no one else was nearby. Lights flicker between blue and green when someone approaches. I weakened the gender element in the color to make the experiencer feel the gender bias in the society.



Week7 Testing and Modification & 3D Printing

Testing and Modification

The original interaction design was tested this week. The Version1 circuit design uses the rotation shaft of the DC motor to control the movement of the propelling rod structure. In practical tests, it was found that the DC motor was difficult to control the rotation Angle and speed. I switched to a 180-degree steering gear and used the rotation of the steering gear Angle to control the movement of the push rod.

The Version1 circuit design uses a series co-cathode RGB LED bulb. In this week's test, I chose to change the light ring to WS282-12Pixels for easier coding and updated the code Version2 according to the flicker effect of the flow lamp. In the Version2 code I use the *FastLED.h* library to control the LED light ring. And use several sets of for loop to complete the flashing effect of different colored lights. The color conversion of LED ring is controlled by ultrasonic sensor and touch sensor.

```
#include <FastLED.h>
#define LED_PIN      2
#define NUM_LEDS     30
CRGB leds[NUM_LEDS];
//RGB LEDLights
```

Fig. Set up lights on Arduino

Version2 adds a buzzer to this new output. I used an active buzzer and used functions to make the sound oscillate. And at the same time let the touch sensor value control the buzzer. The device causes the touch sensor to produce different numbers when worn by different body types. This design gives each experiencer a unique voice. By the uniqueness of the sound and the uniqueness of the standard of no connection.

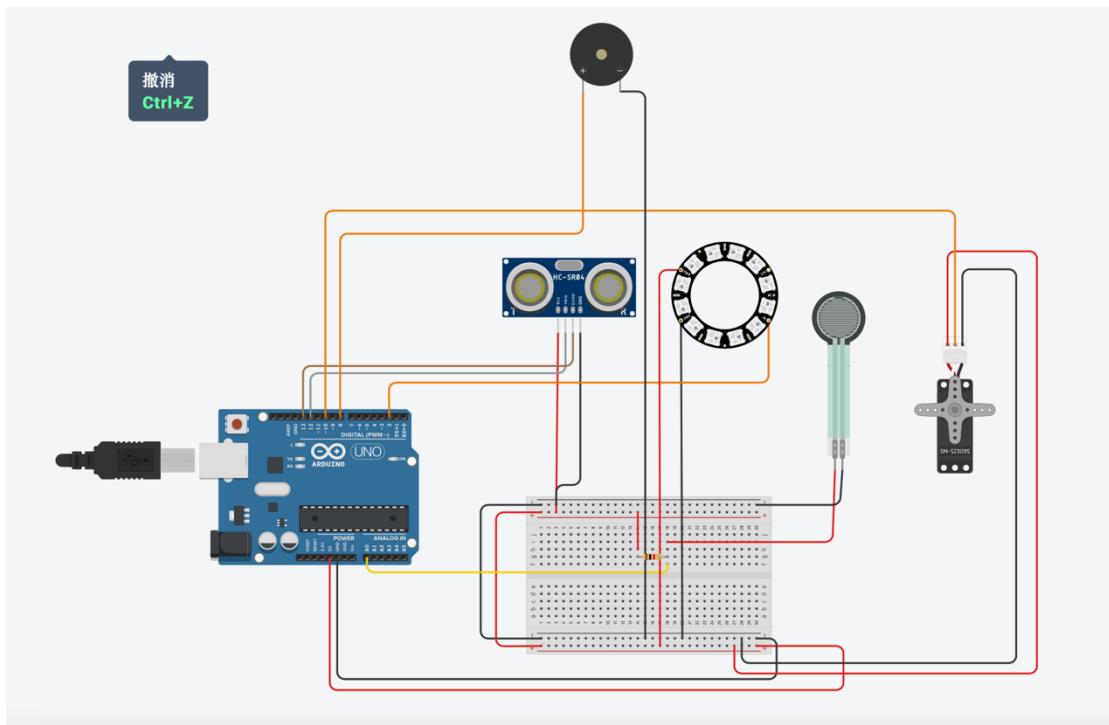


Fig. Circuit Design (version.2)

3D Printing

This week I 3D printed the model I built earlier. Since I designed a lot of folds in the model, the model slice has many faces. This is the most likely reason for the failure of 3D printing after my analysis.



Fig. Failed 3D printing

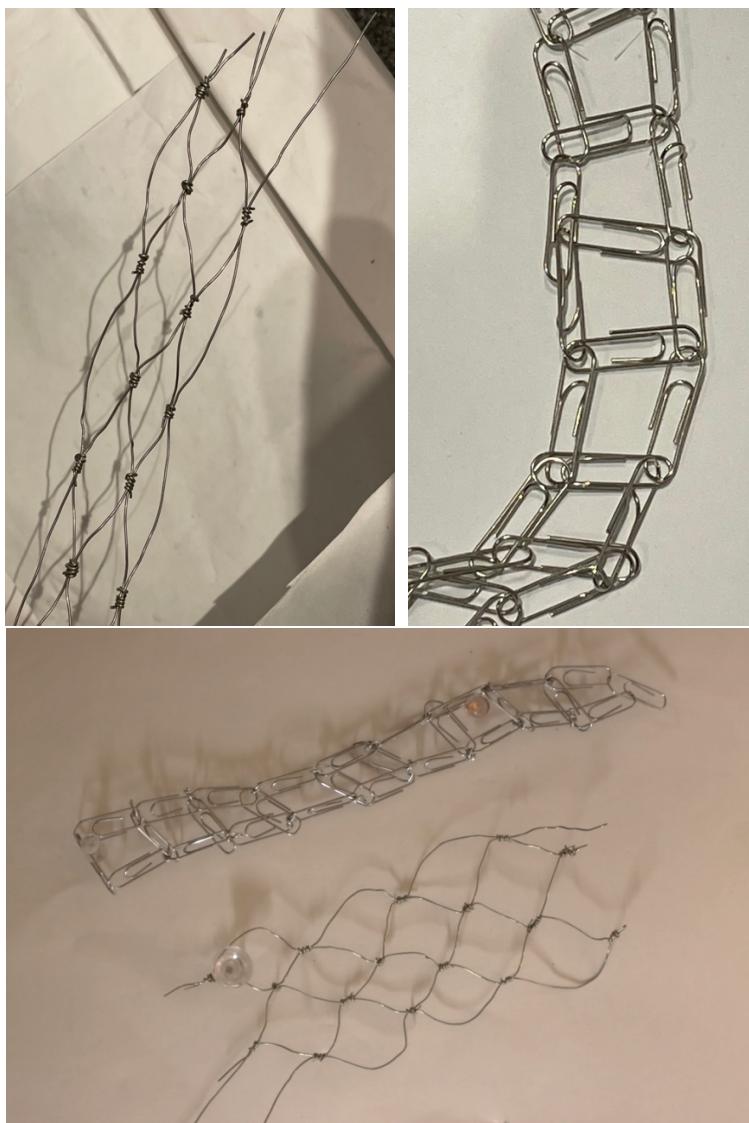
Week8 laser cutting & Model making & Soldiering

Laser Cutting

After asking the technical, I was told that the resin interlining I wanted to use could not be cut, so I changed the initial scheme and chose to use a thin and hard heat-shrinkable sheet instead of the resin interlining and left a hole in the middle and sewed it together with thread before fixing it on the translucent cellophane paper (to create a soft light effect). However, when drawing the hole to be cut in the AI software, the dimensions were not calculated properly so that the hole was too small to be recognized by the software. In the end I chose to use a hole punch to punch the laser cut sheet.

Model Making

Due to the failure of 3D printing and the improper selection of materials for laser cutting, I rearranged and developed the concept. Inspired by security nets and chains, I chose to use wire to make the frame of the model and paper clips to weave it into a waist seal. The desired final effect is to secure the wire frame to the paperclip waist seal. However, the selected iron wire hardness is not enough, resulting in the deformation of the model easily, which requires frequent time adjustment.



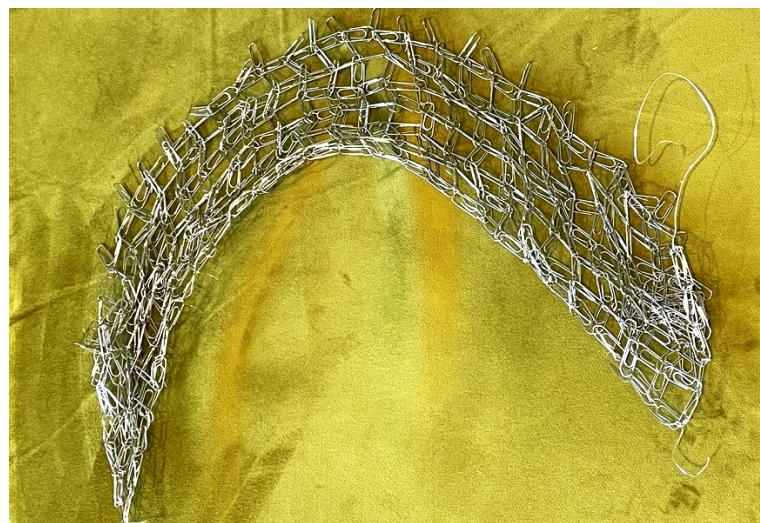
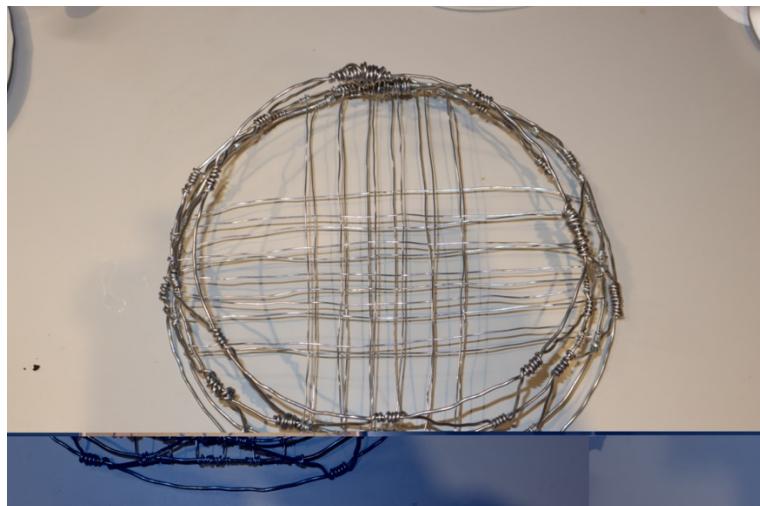


Fig. Model Making

Soldering

As the overall use of parts is not much, the welding workload is relatively small. During the first welding, it was found that if there was no space between the two adjacent lines of welding, the solder could easily melt together and cause a short circuit. In the second welding in the adjacent two lines between the reserved empty line, no longer short circuit.

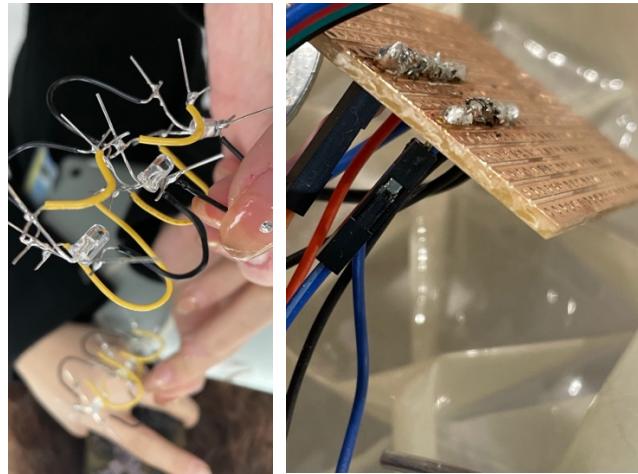


Fig. Soldering

Week9 Test & Assemble & Shoot

Assemble

When assembling movable structures, I found that the way the cut sheets were stuck to the cellophane and then folded would puncture the cellophane. So, I tried to glue the cut sheet with transparent tape and then thread it through the reserved holes before sewing. This increased the hardness of the sheet, and the transparent sheet did not have soft light effect, resulting in poor visual effect in the final test. Finally, I chose to put scotch tape on the glass and fold it into the desired shape. This preserves the soft light and enhances the firmness of the cellophane.

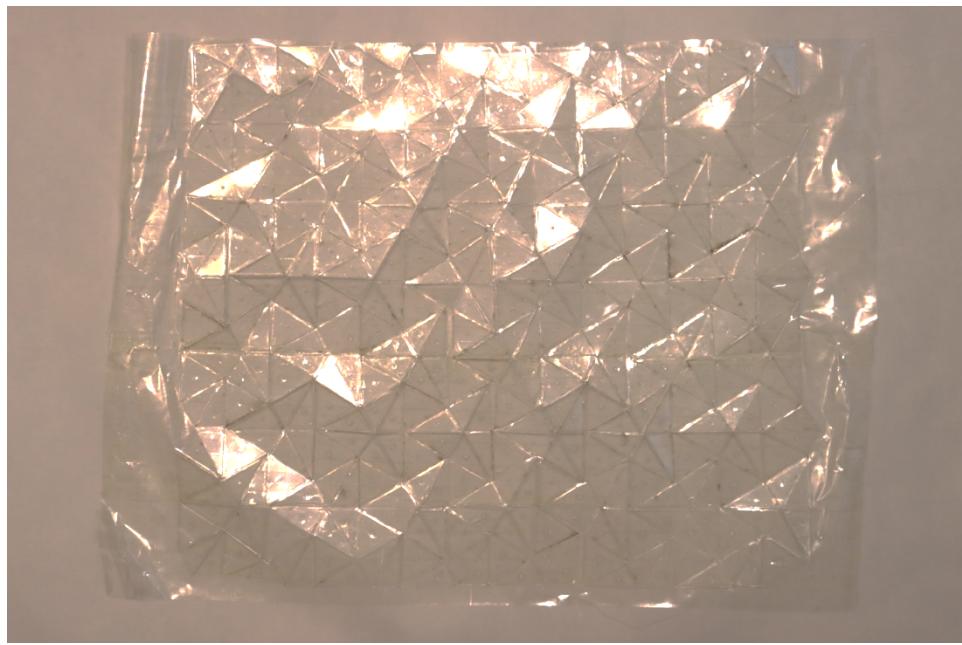
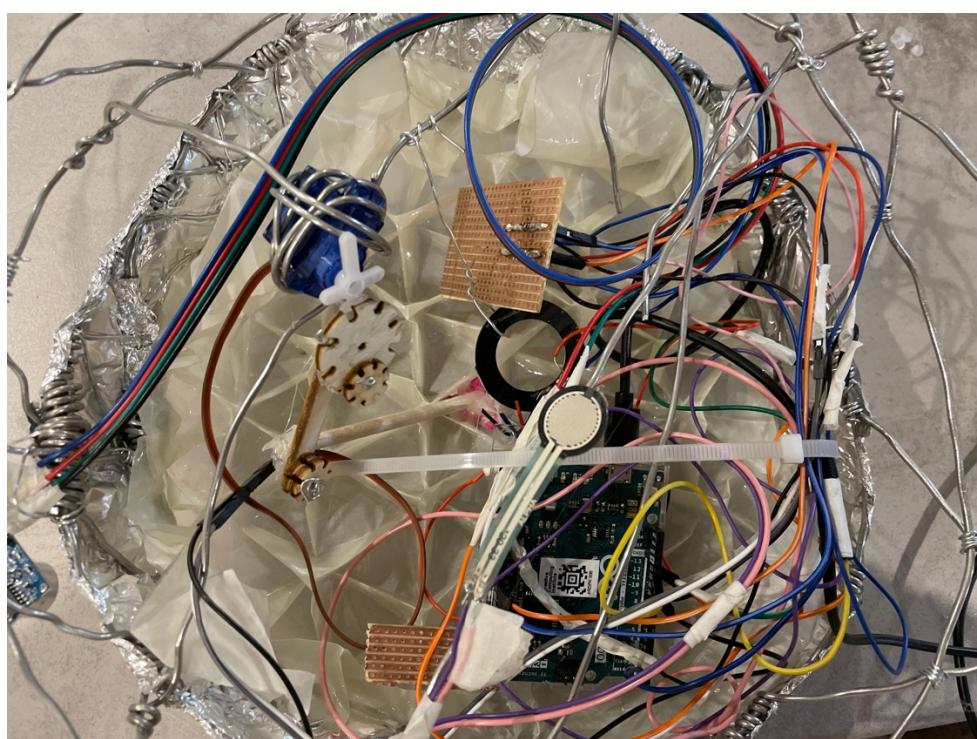
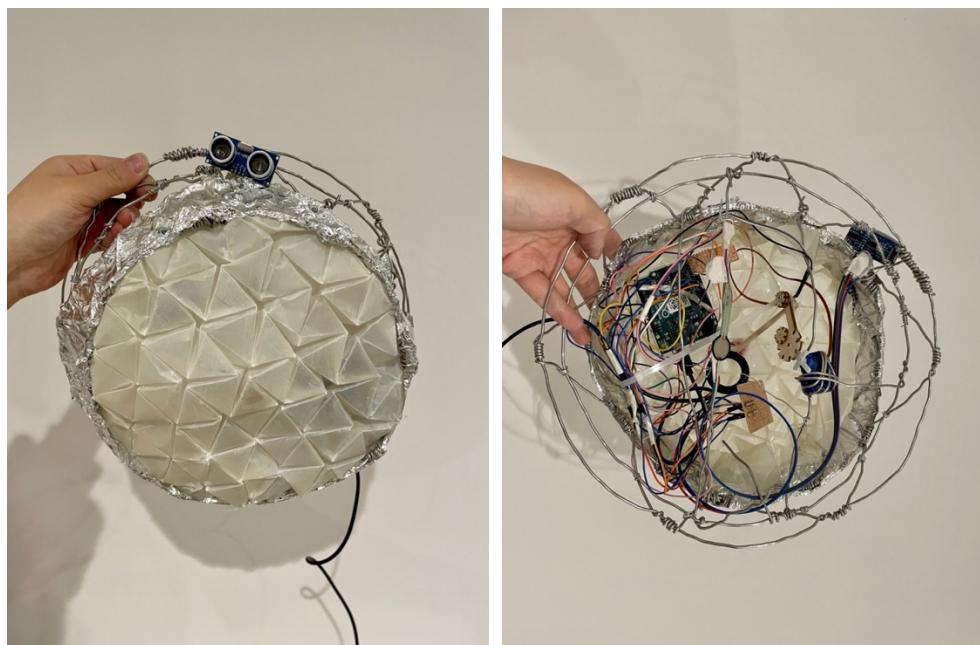


Fig. Assemble

Due to the insufficient hardness of the selected iron wire when making the model frame, deformation and displacement occurred in the assembly link for a long time, which not only increased the workload but also wasted a lot of time.



The final shot



