Portfolio

Industrial Design

Mingwen Cui

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Introduce

Hello, I am Mingwen Cui. I am a designer fueled by passion and creativity. I find joy in connecting with people from diverse cultures and communicating in different languages, as it provides me with unique perspectives when approaching challenges. Proficient in studying various software, I believe tools should enhance, not limit, creativity, and I am committed to investing time and energy in continuous learning to achieve optimal results. Beyond digital realms, I take great pleasure in utilizing 3D printing technology to craft and refine prototypes.

Language

Mandarin ●●●●●

English ●●●●

Japanese ●●●

Korean ●●

Spanish ●

Skills

Concept ideation

3D Modeling

3D rendering

Prototyping

CG animation

Education

Bachelor of Arts at University of Alberta

Double major in Art & Design and Linguistics

Contact

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Software

Adobe Premiere Pro ●●●

Adobe After Effects ●

Adobe Photoshop ●●●

Adobe Illustrator ●●●

Adobe InDesign ●●

Rhino 7 ●●●●●

Blender ●●●●

Fusion 360 ●●●

Keyshot ●●●●

Figma ●●●

Sketchbook Pro ●●●

PrusaSlicer ●●●●

Project 1

Outdoor Selfie Stick

A selfie stick designed for outdoor enthusiasts

In today's era of social media flooded with breathtaking landscapes and adventurous explorations, taking selfies has become an indispensable part of sharing outdoor adventures and travel experiences. Therefore, to meet the selfie needs of outdoor enthusiasts, I have designed a selfie stick specifically crafted for them.

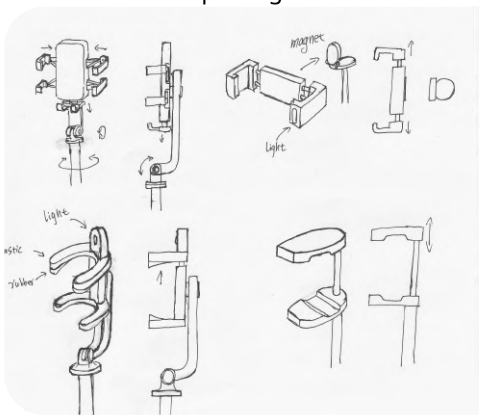
Oct. 2023 - Dec. 2023

Individual project

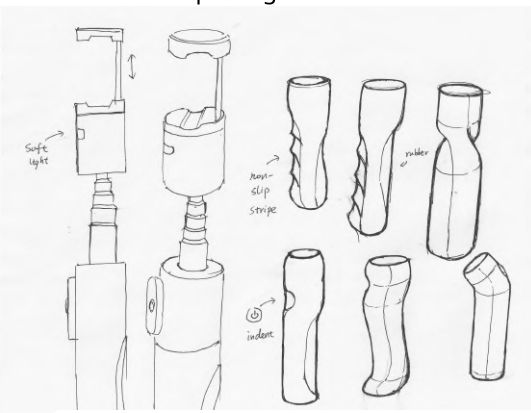
Sketch

I sketched out the outline and specific details based on the textual descriptions of the possibilities.

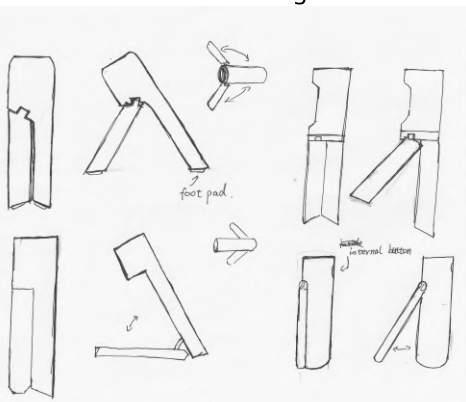
Top design



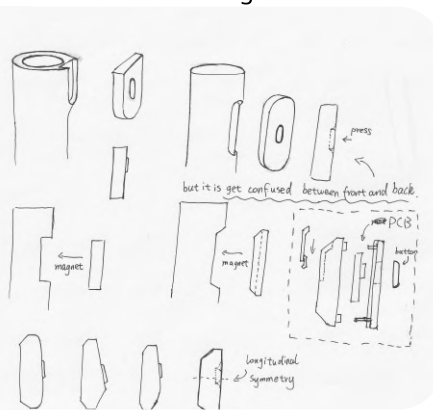
Clip design



Bottom design



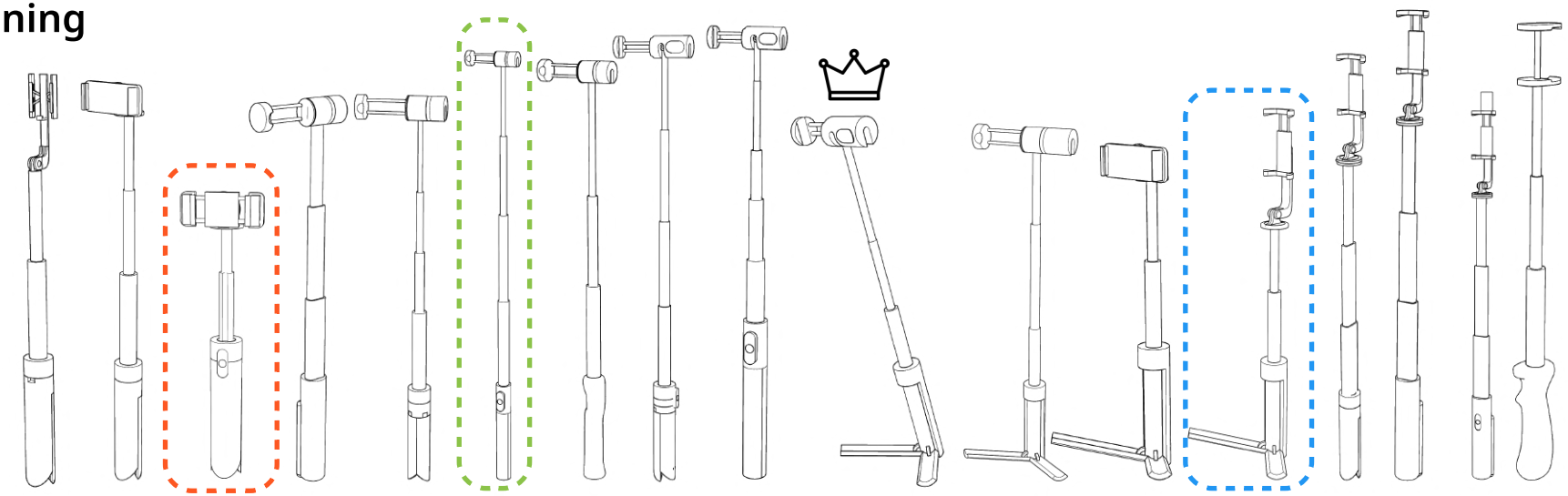
Button design



Concept screening

I scored and rated each concept, selecting those with higher scores for conceptual iterations, followed by further refinements in subsequent iterations.

In the end, the amalgamation of the Clip from Concept 2 with the Tripod from Concept 3 received the highest score of 3P-2P.



Concept 1 | Concept 2 | Concept 3 | Concept 4 | Concept 5

Advantage
Easy to pick up phone

Disadvantage
Top part is heavy
Limited angle adjustment

Advantage
High foldability
Lots of room for flash

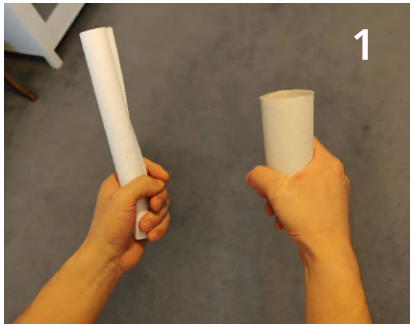
Disadvantage
Limited extension length
Longer rod inconvenient

Advantage
Easier to place
More angle adjust

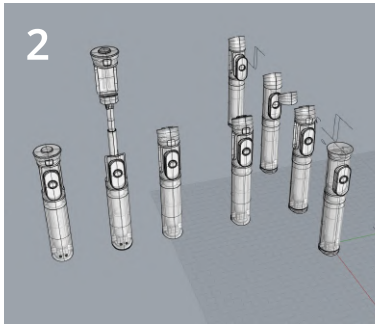
Disadvantage
Unstable Placement
Brittle leg structure

Prototype

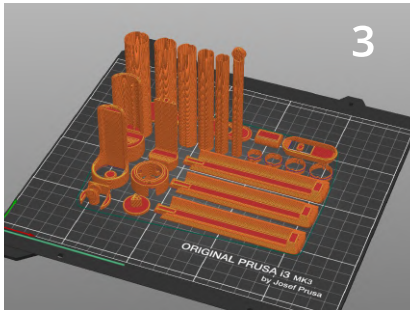
I use 3d print to quickly produce prototypes and test the stability of various tripods.



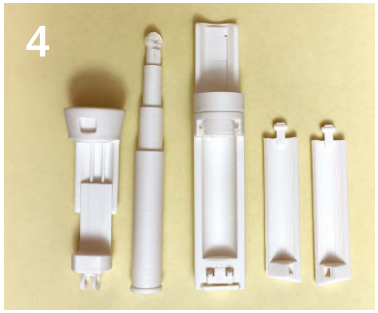
Determination of diameter and length



Model and iterate on Rhino



The arrangement of 3d printed parts



Parts assembly

Seek a way

The second tripod

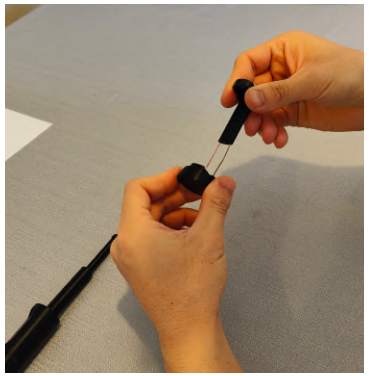
The Third tripod

Tests

Feel test

Button test

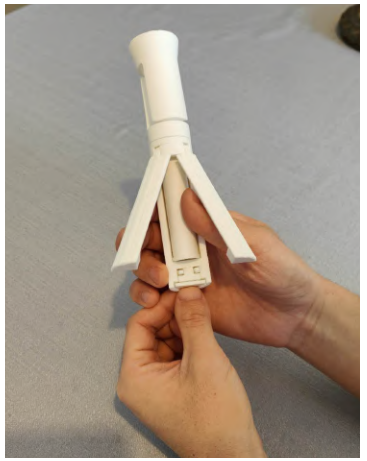
Expand the length



Expansion test

Comparison

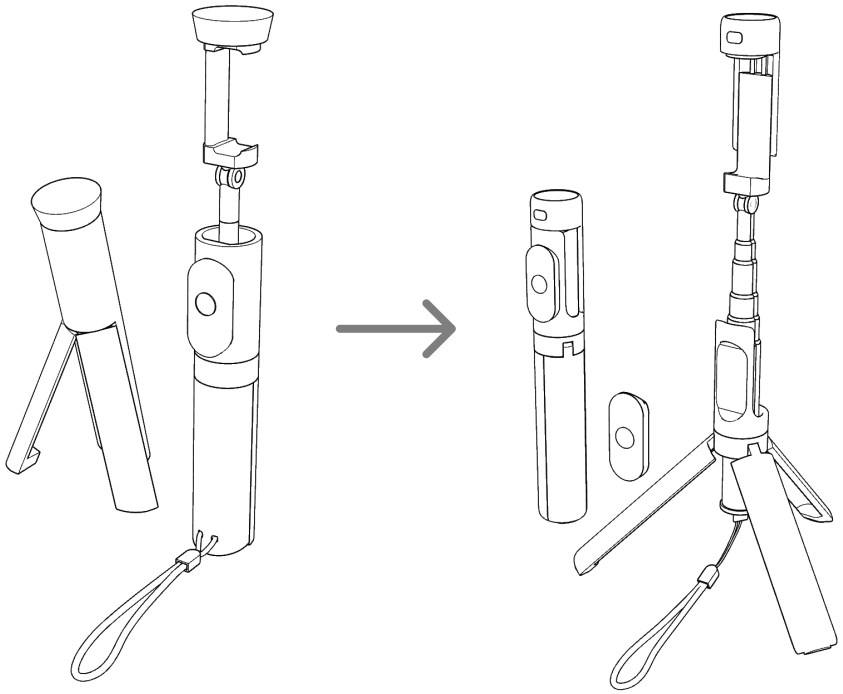
Expansion test



Bottom button test

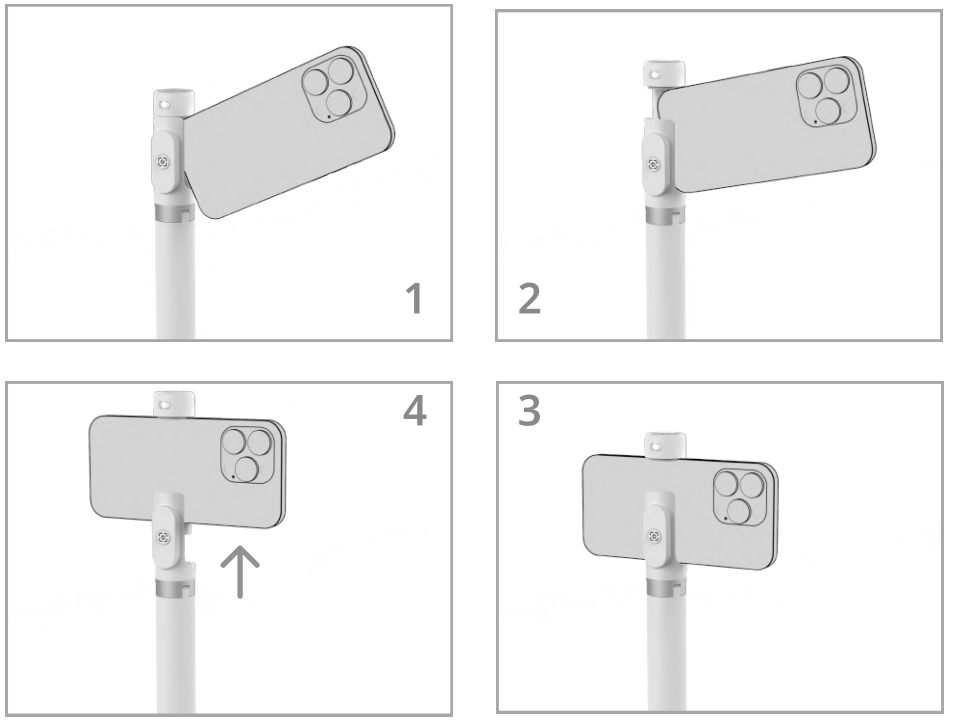
Findings & iterations

I seek opinions from friends to understand their preferences in using selfie sticks.

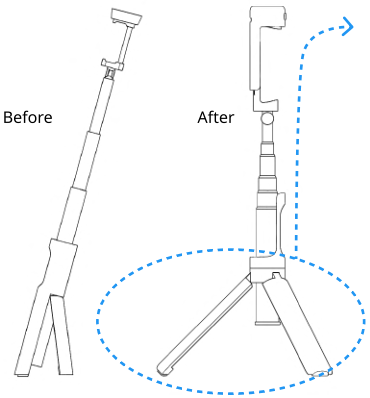


Use process

The use process of the final design after problem solving

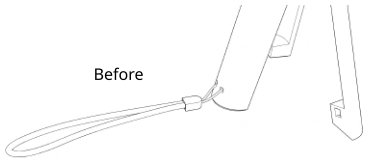


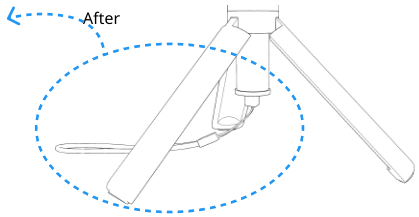
1. Selfie stick extended can lead to an unstable center of gravity.



Modify back to the common tripod

2. The rope affects the grip sensation.





Move the rope attachment point from the handle to the bottom of the internal metal rod.

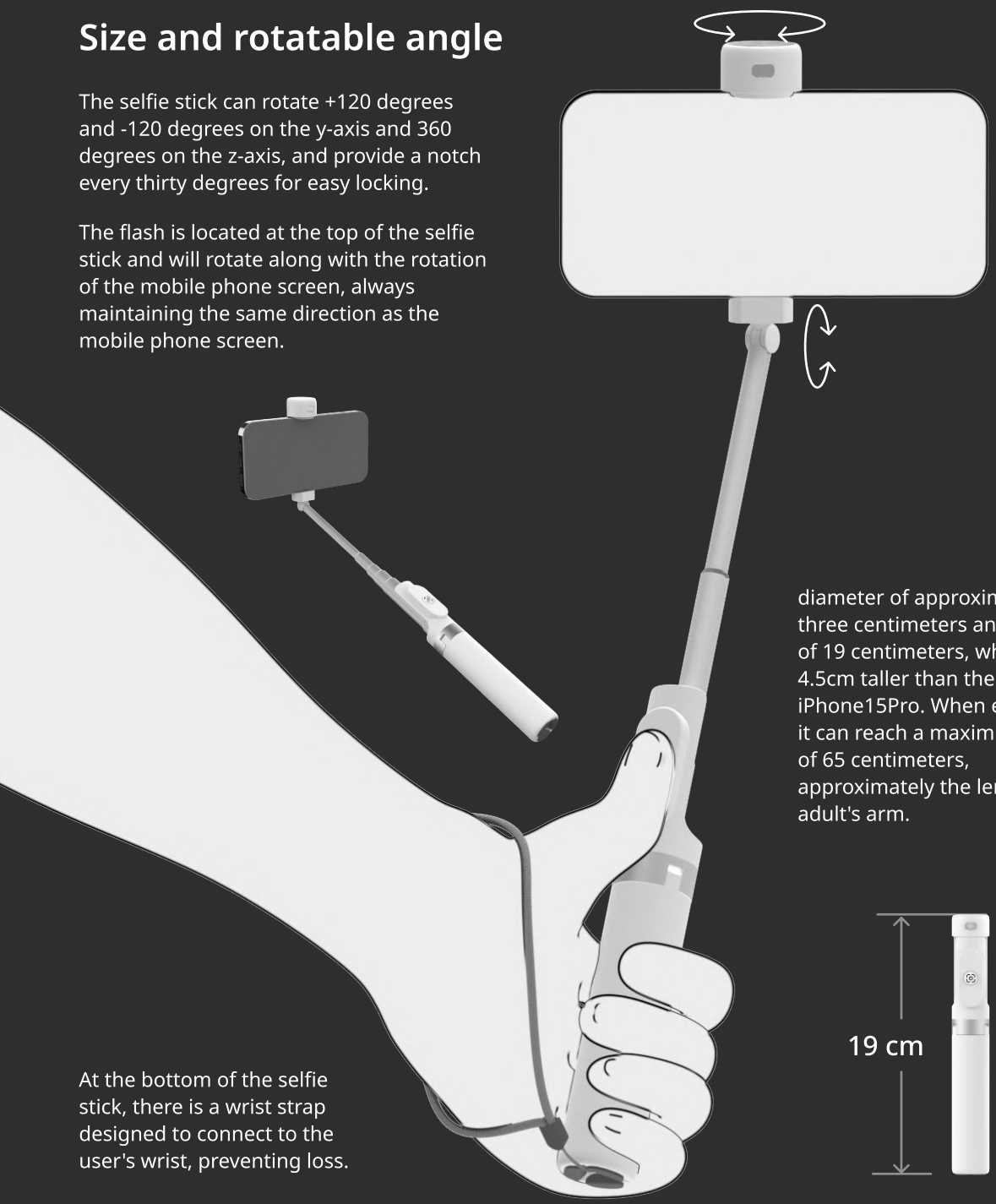
3. Two long rods may result in weak resistance to longitudinal forces.

4. The conical head is not easy to demold during the production process.

Size and rotatable angle

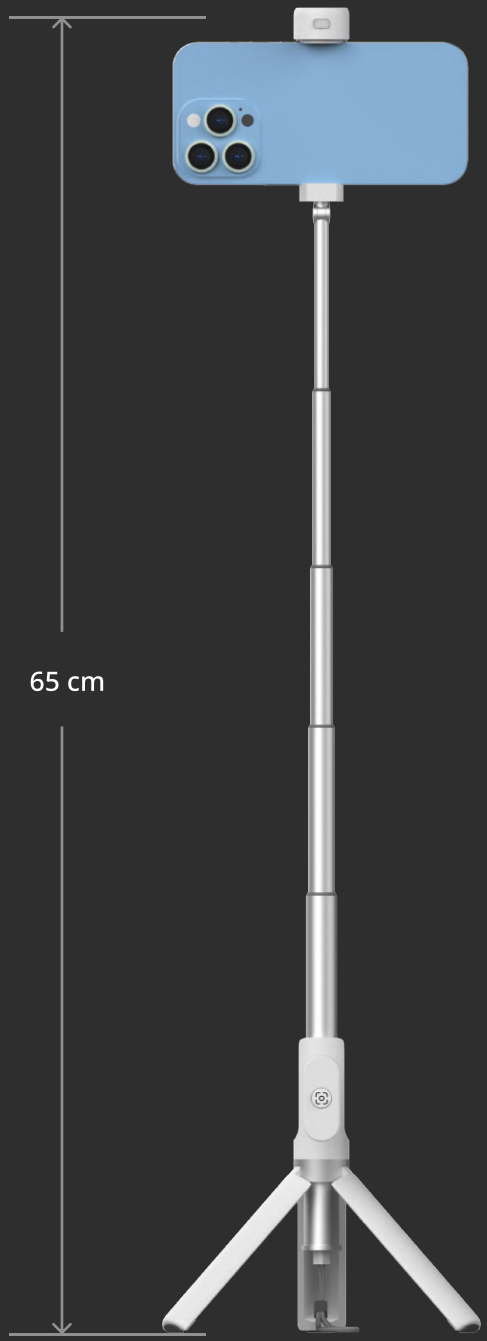
The selfie stick can rotate +120 degrees and -120 degrees on the y-axis and 360 degrees on the z-axis, and provide a notch every thirty degrees for easy locking.

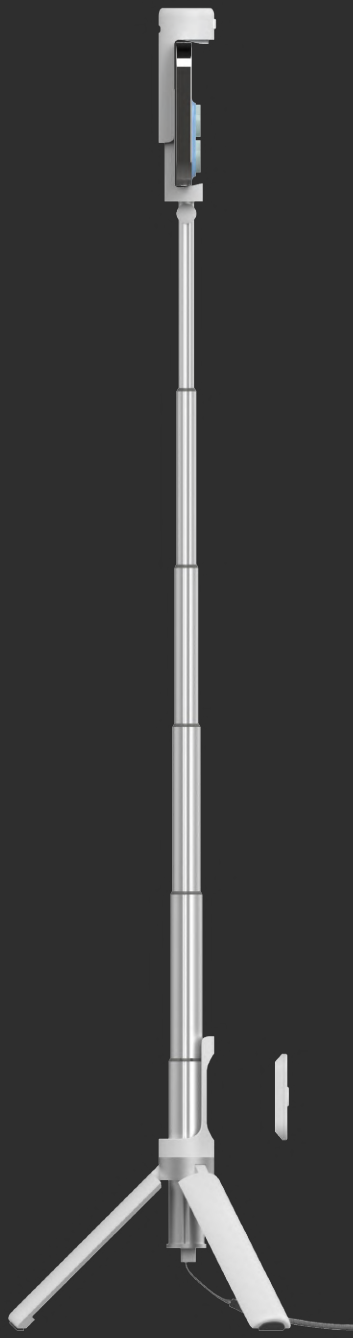
The flash is located at the top of the selfie stick and will rotate along with the rotation of the mobile phone screen, always maintaining the same direction as the mobile phone screen.



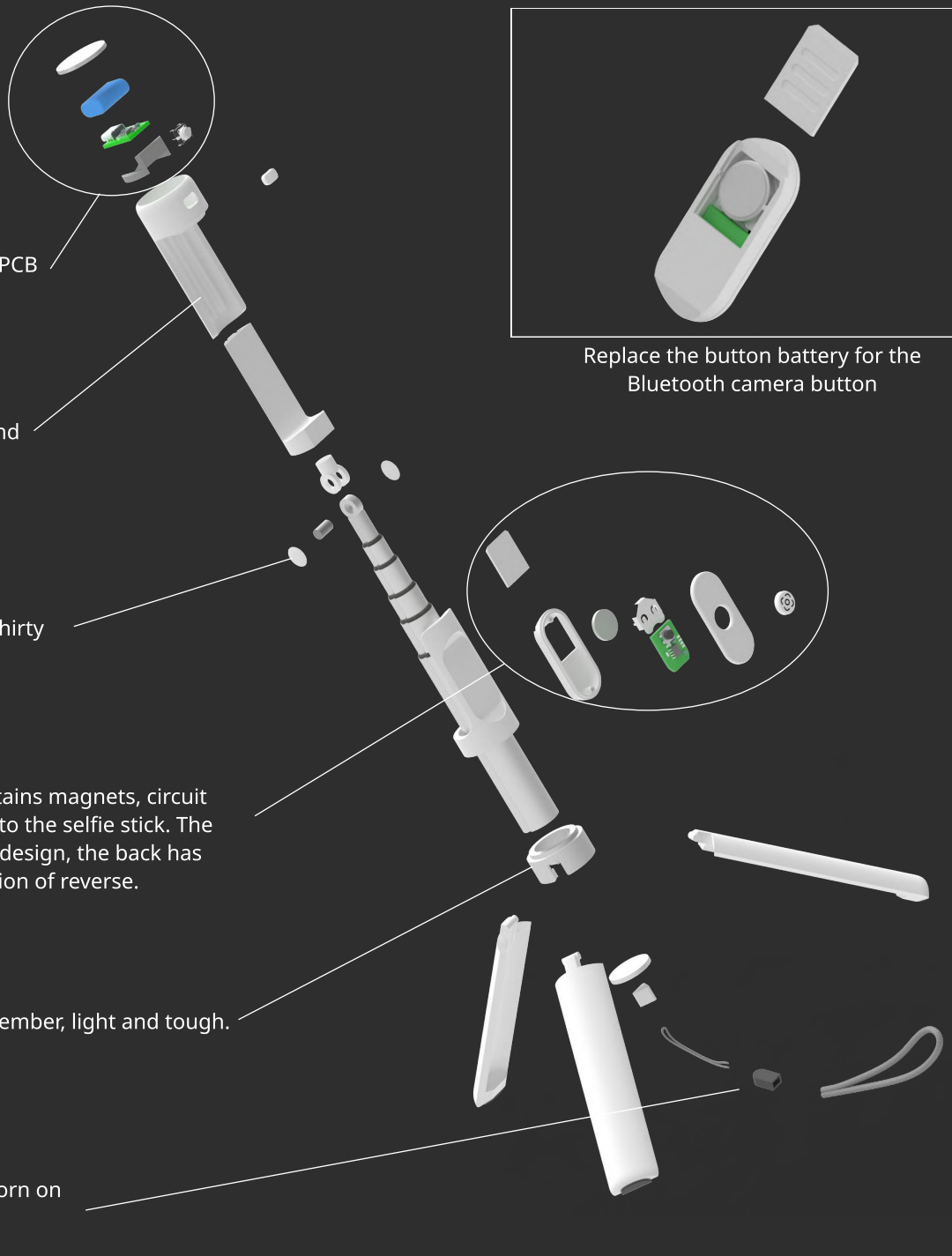
At the bottom of the selfie stick, there is a wrist strap designed to connect to the user's wrist, preventing loss.

diameter of approximately three centimeters and a height of 19 centimeters, which just 4.5cm taller than the iPhone15Pro. When extended, it can reach a maximum length of 65 centimeters, approximately the length of an adult's arm.





Explosion diagram & details



Circuit board, battery, switch, PCB holder, transparent button.

Dual-track design for easier and more stable extension.

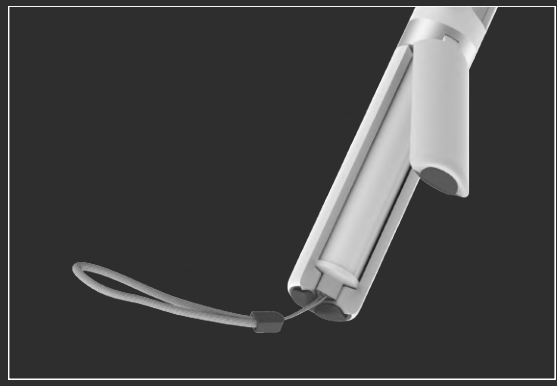
Protective shell and a rotating structure with notches every thirty degrees for seay locking.

Bluetooth camera button contains magnets, circuit board, battery, easy to attach to the selfie stick. The upper and lower symmetrical design, the back has binder to prevent the installation of reverse.

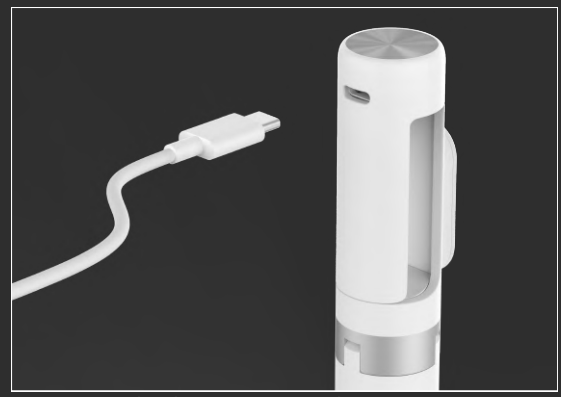
Aluminum alloy connection member, light and tough.

A rope pendant that can be worn on the wrist or tied onto a bag.

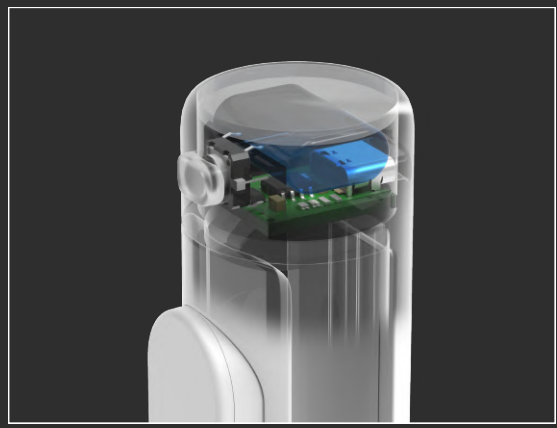
Replace the button battery for the Bluetooth camera button



Rubber foot pads &Skin-friendly handle.



Brushed top cover & Charging port.



backlit button & Long battery life

Project 2

Outdoor Speaker

Redesign a shell for the speaker

In today's era of social media flooded with breathtaking landscapes and adventurous explorations, taking selfies has become an indispensable part of sharing outdoor adventures and travel experiences. Therefore, to meet the selfie needs of outdoor enthusiasts, I have designed a selfie stick specifically crafted for them.

Nov. 2023 - Dec. 2023

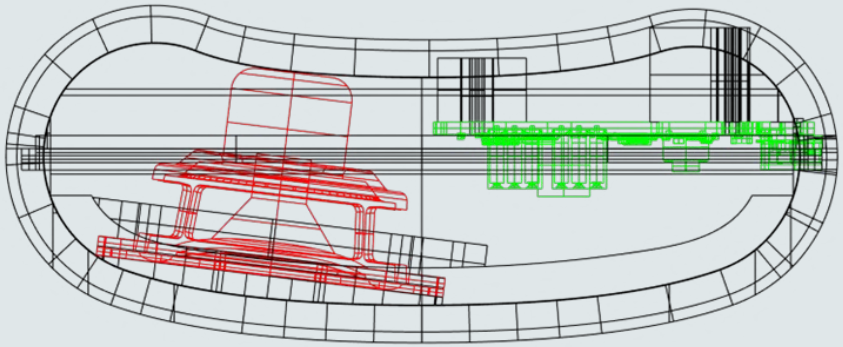
Individual project

Dismantling the original speaker

Internal assembly arrangement

I design a speaker that is easy to carry, can fit in a pocket, and feels well when holding it. In order to reduce the volume as much as possible, I designed the horn to be mounted at an Angle.

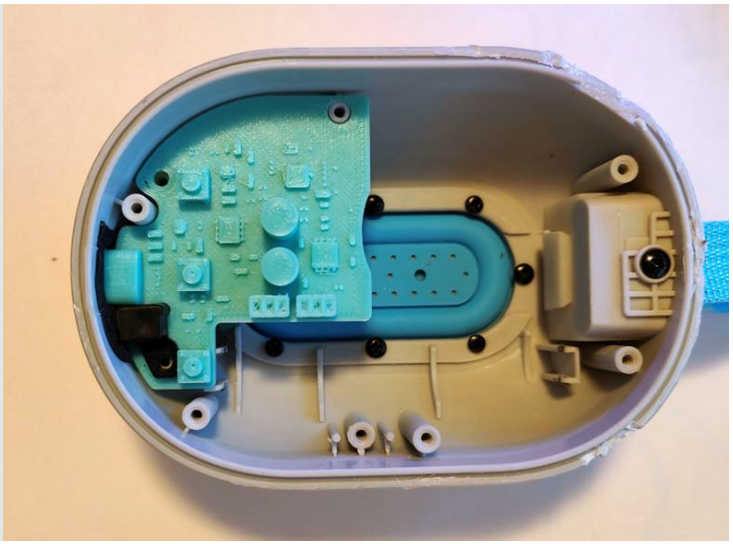
The green is the motherboard, and the red is the speaker.

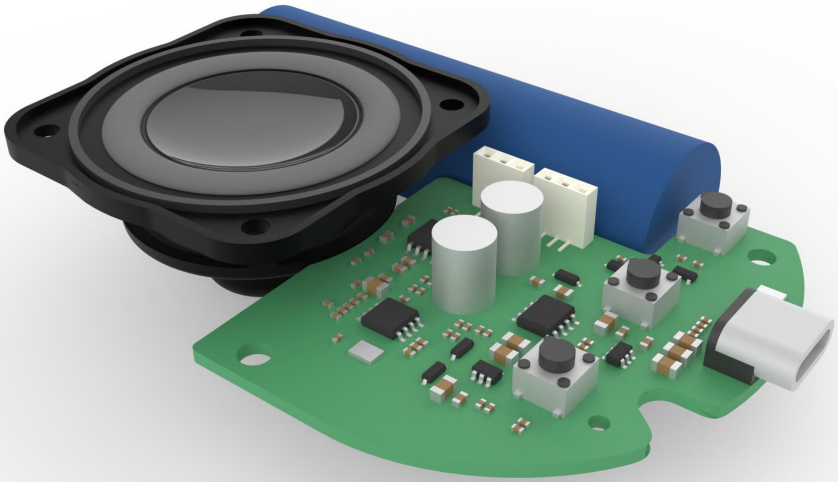


Measure PCB

Determined the size and positions of each component.

And 3D printed a model matching the motherboard's shape to validate its size, assisting in the subsequent design phase.





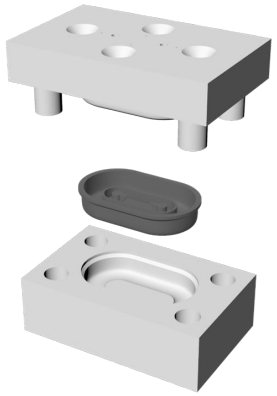
A NFC sticker with bluetooth connection

The original speaker did not feature an NFC sticker to assist users in Bluetooth pairing. In order to provide a more convenient and swift Bluetooth connection experience, I bought NFC stickers and programmed them with bluetooth connection commands.

Redesign & make a subwoofer

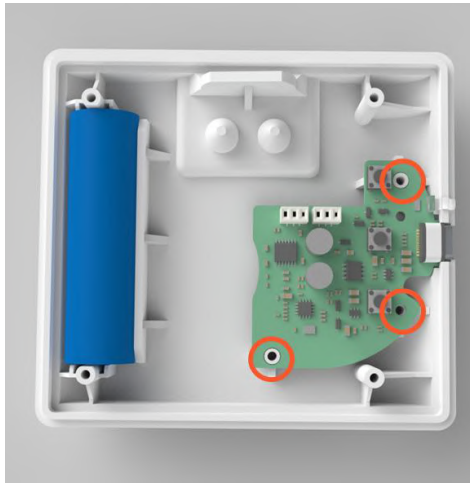
The original subwoofer is too big that it wouldn't fit in my speaker, so I needed a smaller subwoofer. I used 3D printing technology makes molds.

I use silicone as the diaphragm material for the subwoofer and bond it together using super glue.



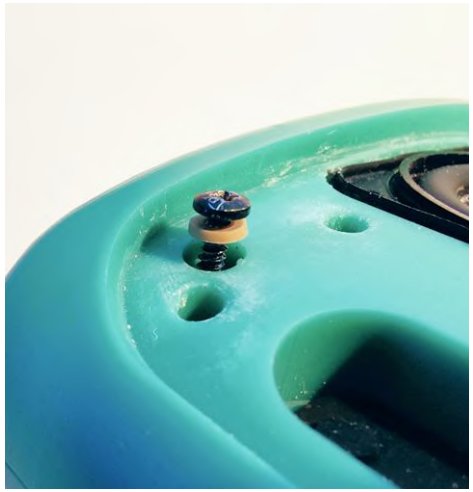
Design of screw holes

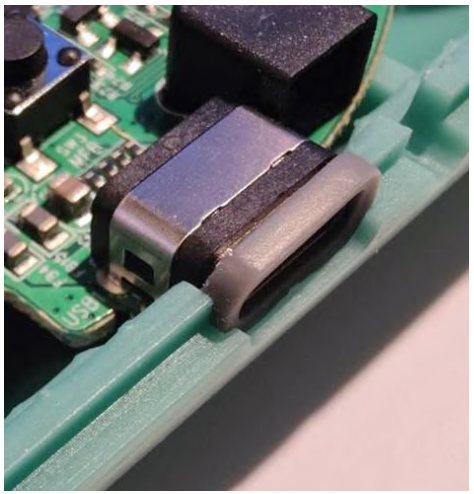
The internal structure is highly intricate, utilizing 13 short screws (in red) to secure the speakers, motherboard, and clips, along with 4 long screws (in deep blue) to fasten the upper and lower components.



Waterproof

In the design process, considering the function of water and dust resistance, I used a lot of rubber pads. This requires consideration of the arrangement of each internal component to ensure that these designs do not affect demolding and maintain aesthetics.





Back design

Users can clip the speaker onto their pockets, place it on the ground, or lay it flat on the floor.

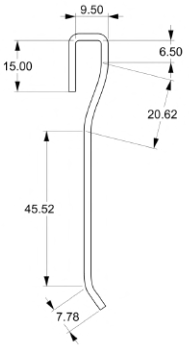
Therefore, a metal clip and two footpads are the easiest and simplest solutions to implement.

Foot pads

The sound will vibrate in the process of playing, and foot pads can fix it. The addition of a clamp behind the speaker creates extra height, necessitating an adjustment in the height of the foot pad to maintain balance.

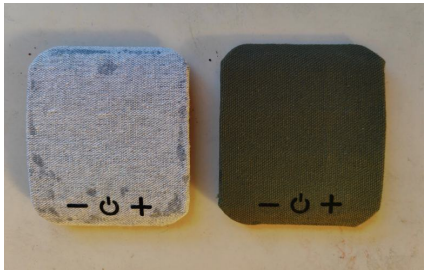
Metal clip

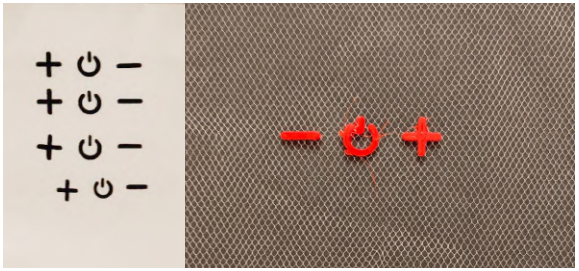
I utilize a Fiber Laser Cutter to cut metal sheets of varying materials and thicknesses, subsequently bending them.

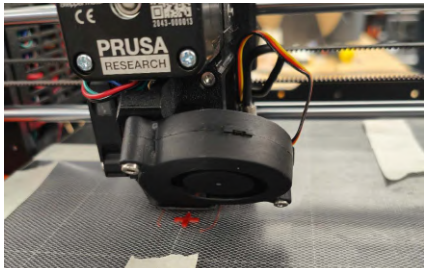


Fabric and buttons

Fabric choice for the speaker involves considerations like dirt-proof, waterproof, scratch resistance, durability, aesthetics, and sound impact. Initially, I attempted to insert fabric within PLA layers for bonding but realized a loose grid was necessary. Therefore, I opted for vinyl adhered to the fabric as an alternative solution."

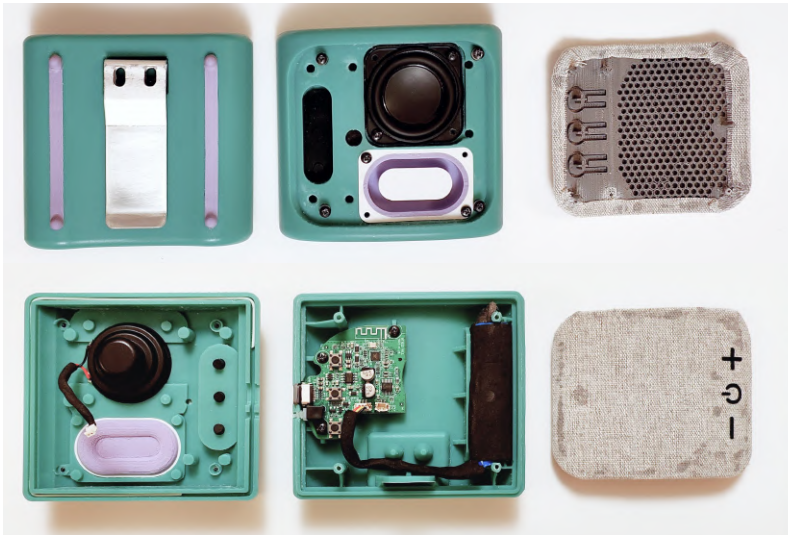






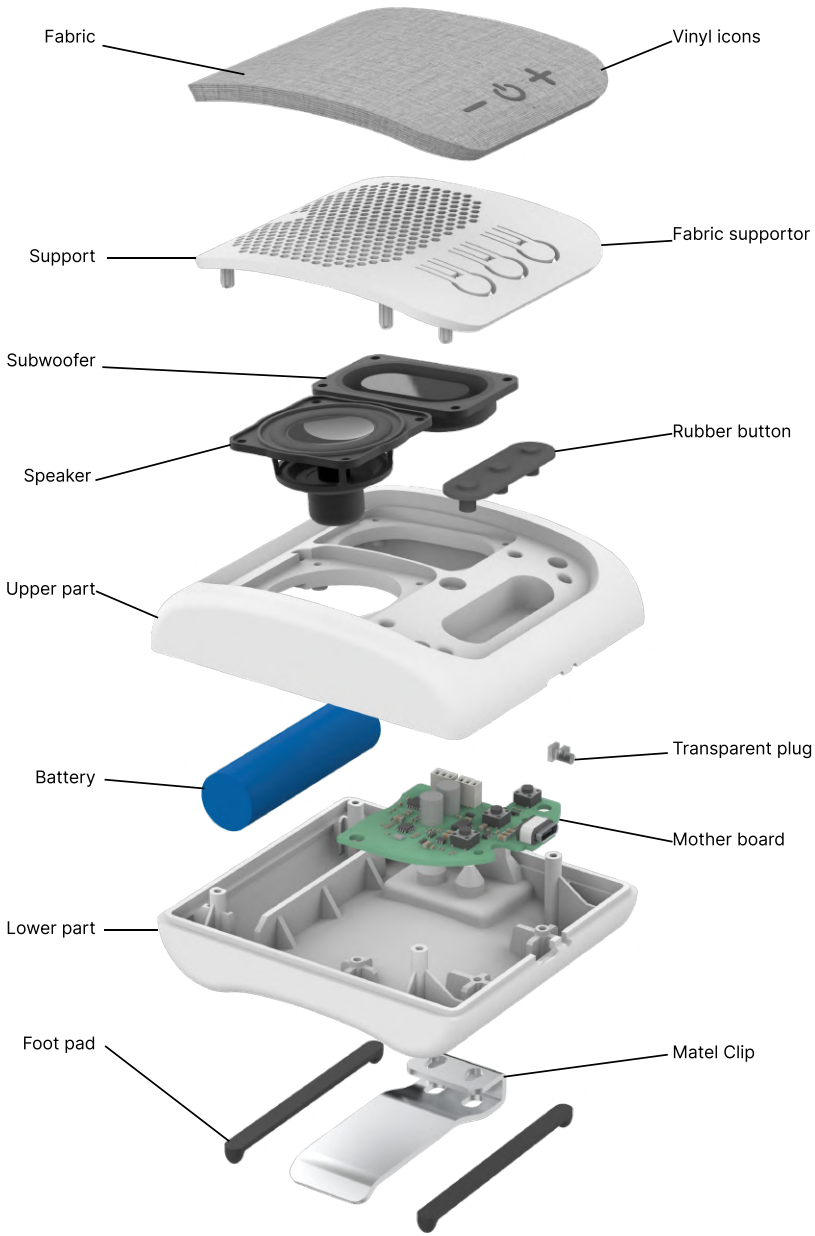
The final prototype

I use SLA printing in visible areas to minimize errors in the design as much as possible. In unseen areas, I utilize FDM printing to enhance efficiency and utilize material flexibility. SLA printing works are brittle and easy to break. While FDM may lack sufficient shear strength horizontally, it exhibits good toughness vertically.



Exploded view

A single image showcasing all the selling points.



Renderings

Online Purchase

Product testing

Project 3

Wall Shelf Series

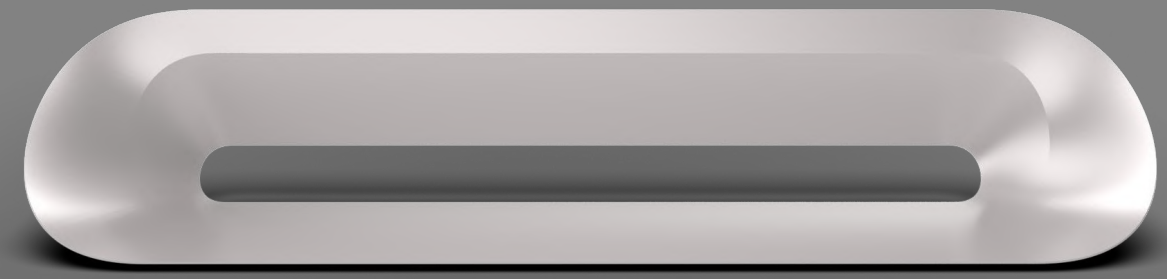
A series of minimalism wall shelfs

This is a metalworking assignment where I utilized various tools distinct from woodworking, including welding, angle grinder, pipe bender, cold saw, and sheet bender. Additionally, metal offers advantages such as thinner thickness, higher strength, and easier connecting, which woodworking cannot match. Drawing inspiration from automotive design, I incorporated angularity and curvature into the shelf to create a more three-dimensional feel. Moreover, I innovatively designed two versions, the Standard and PRO. The PRO version features built-in lighting with two power options.

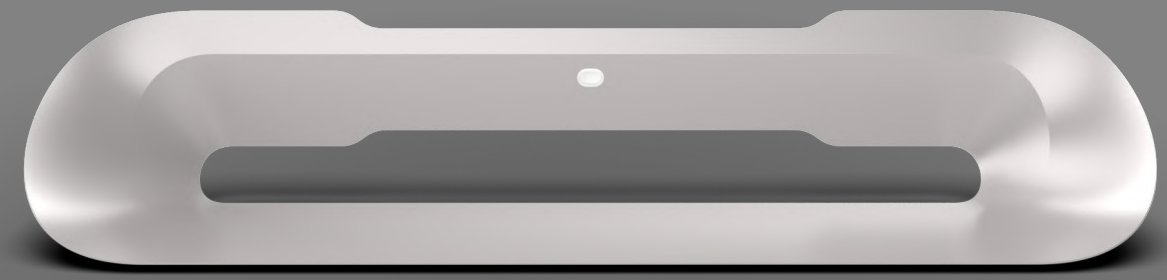
Mar. 2024 - Apr. 2024

Individual project

Standard Version

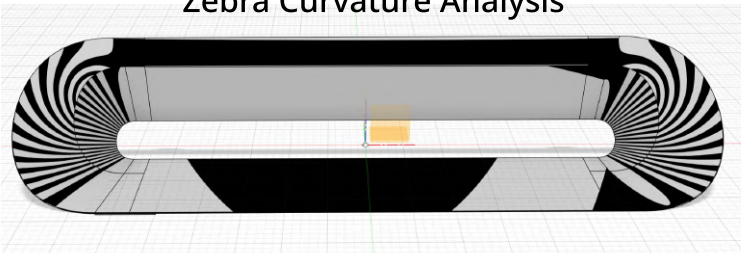


PRO Version

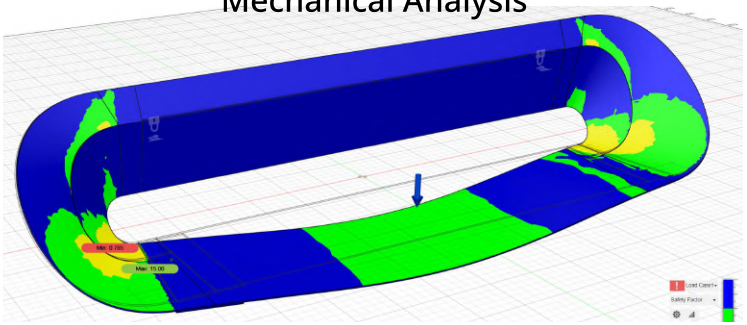


Standard Version

Zebra Curvature Analysis



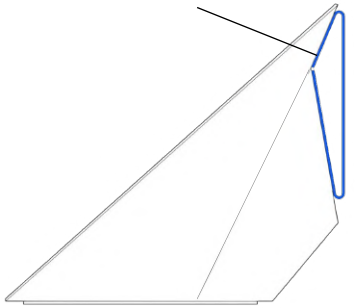
Mechanical Analysis



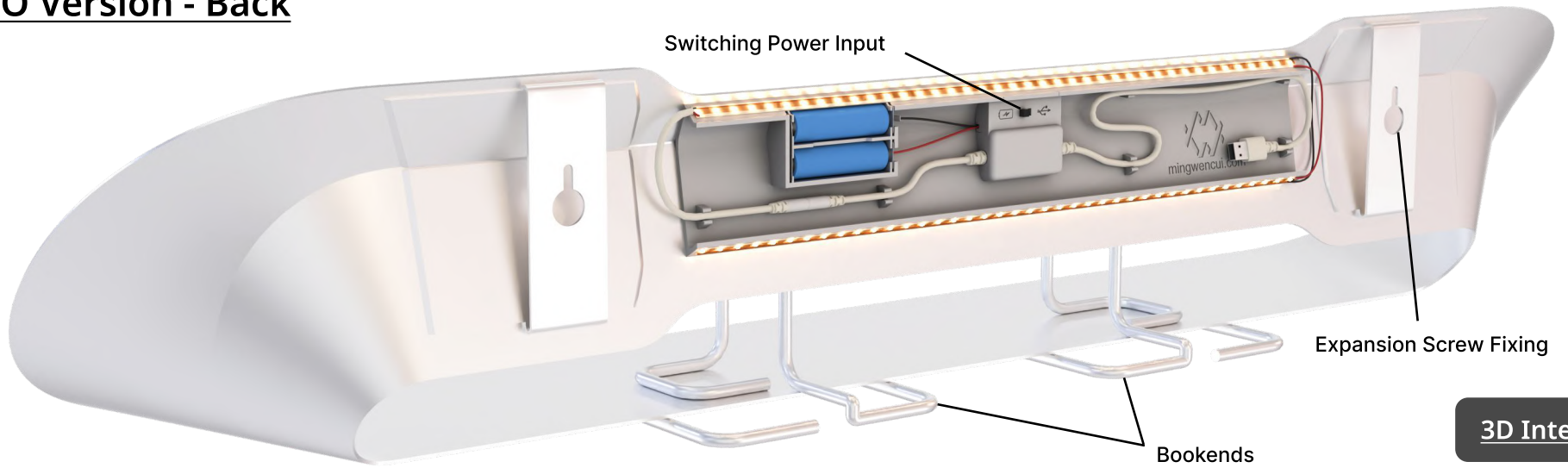
In the design process, not only smoothness of the surfaces (G2 smoothness) is considered, but also structural strength. To achieve this, I drew inspiration from paper folding, where I slightly fold the upper part, enhancing the structural load-bearing capacity. Moreover, this allows ample space inside the PRO version to accommodate LED strips. For the PRO version, I offer users two options to power the shelf: either through batteries or via an external USB connection. The difference between the regular and PRO versions lies in the design of the light button and overall appearance, while both versions maintain the same structural strength.

Bookends Using Effect

Stable Triangular Structure



PRO Version - Back



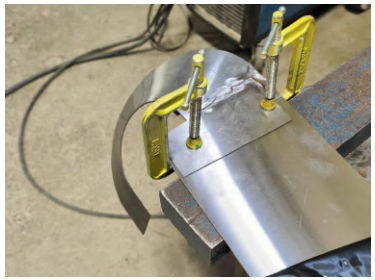
3D Interaction

Working Process

Fiber Laser Cutting

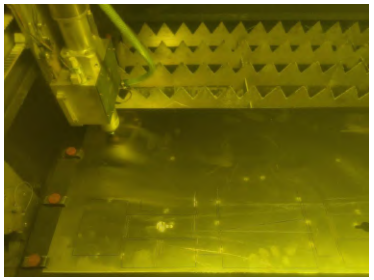
Roll Sheets

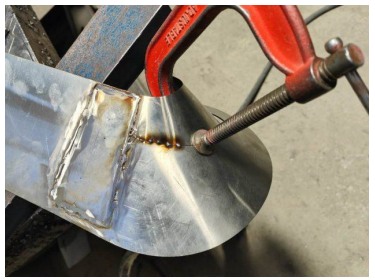
Bend Sheets



Welding & Grinding

Fill Gaps & Spray



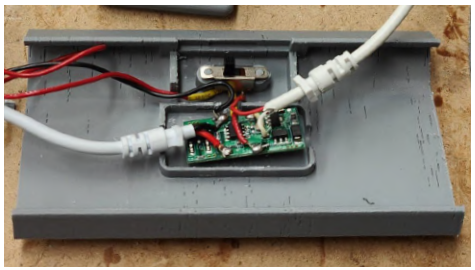


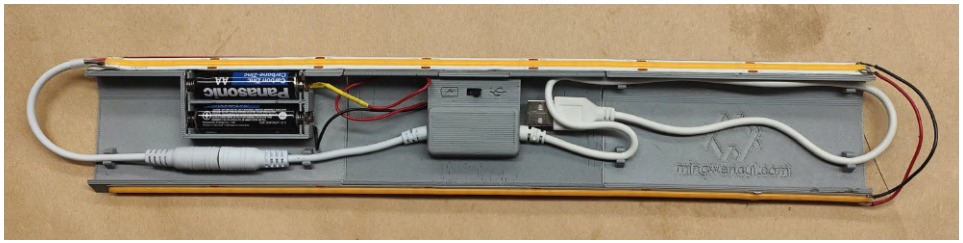
Lighting device design

Three Parts Design

From left to right are the battery box, the power energy selection switch (back) and the light switch (front), and the wire organizer with my logo and website.

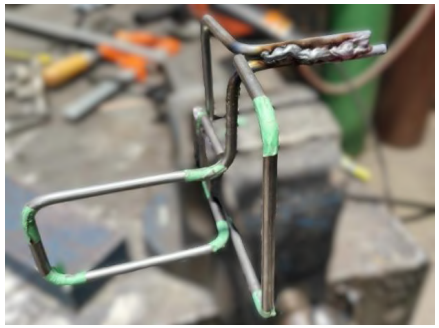
The upper and lower light strips, the battery box, and the switches are all welded together.





Bookends

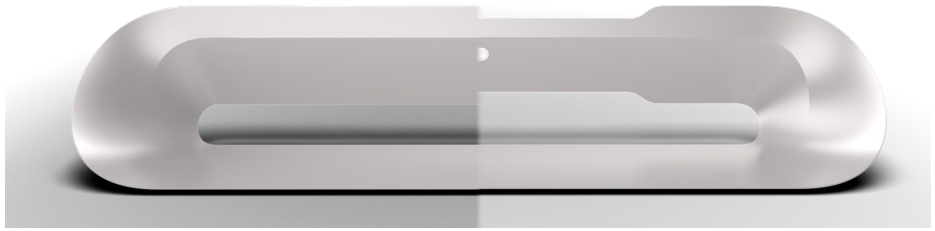
Bending, Welding & Grinding Steel Robs



Standard Version (Mirror Surface)

View Landing page

Rendering Image



Bending, Welding & Grinding Steel Robs

PRO Version (White Smooth)

Watch Video

Project 4

Other works

Showcasing my woodworking and modeling skills

The rest of the work is to showcase my prototyping abilities, which includes the making of miniature models and woodworking. At the same time, the design process takes into account the production, packaging, transportation and user experience.

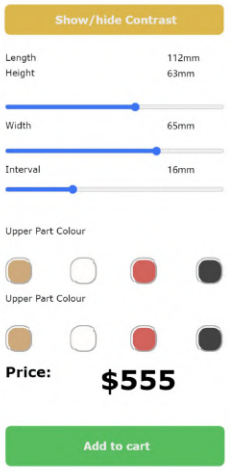
For more pictures and information, please check my website: mingwencui.com

Jan. 2023 - Apr. 2023

All individual projects

Side table

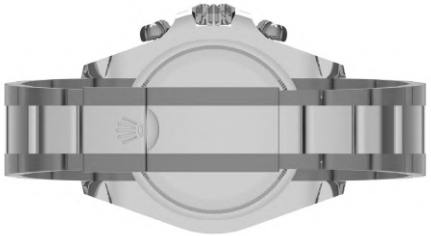
I connect the web page with the goods, and users can choose the appropriate size and colour according to their preferences and needs, and synchronously see the price.

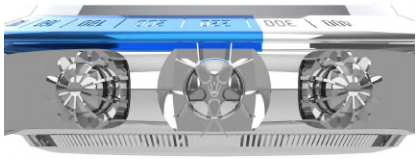


Woodworking prototype

Rolex watch design

This Rolex timepiece draws inspiration from the vibrant blue hues of the Bugatti Chiron, with its crown crafted to mirror the car's rim. The dial, inspired by automotive dashboards, features French Racing Blue, coupled with a meticulously designed alloy case for a dynamic allure.



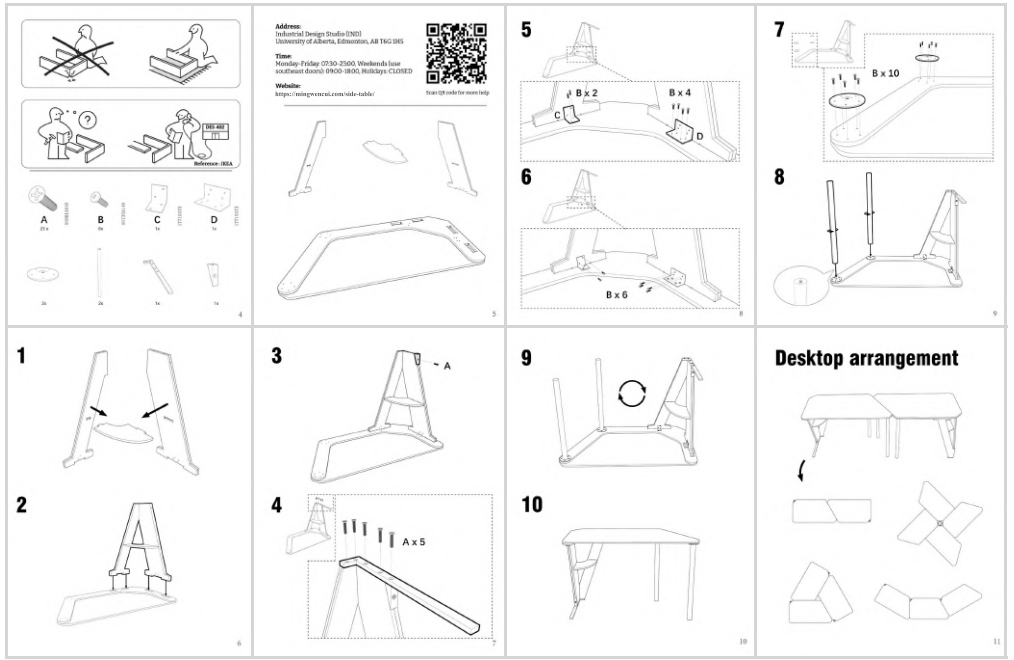


Office Table

In the contemporary workplace, teamwork has become a crucial factor for career success. The design of teamwork tables emphasizes creating an innovative, flexible, and interactive space for the workplace. It addresses modern office challenges, such as coordinating monitors with desks and organizing cables, aiming to enhance work efficiency and improve the overall work experience. The design also covers transportation, assembly and packaging, which involves the whole process design from manufacturers to users.

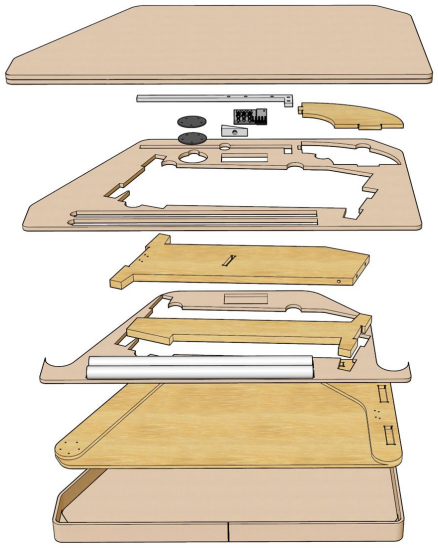
Table Installation Manual (Adobe InDesign)

Download



Final Prototype

Exploded View Of Table



Exploded View Of Packaging

The use of VR technology

Initially, I recorded a classroom video using small white paper as reference points to establish the floor position. Subsequently, I utilized a panorama camera app to capture HDR environmental light. Then, I use employed Blender's camera motion tracking. This process allows the rendered desktop to accurately replicate the nuanced lighting and tones of the environment on the glass surface. Finally, I used point lights and vertical stereo planes to simulate realistic shadows.

Click to Watch

Microsoft mouse packaging design

Watch Videos

The packaging of the Microsoft mouse consists of two main components: the outer shell and the internal support structure. The outer shell not only provides a clear explanation of the product but also serves as an effective protective layer. The design takes into consideration strategically placed holes for convenient shelf hanging, enhancing the display convenience. The internal structure is meticulously designed to securely hold the mouse, USB Bluetooth receiver, and accompanying manual. The overall design is both compact and environmentally conscious, delivering an exceptional unboxing experience for users. Throughout the design process, multiple iterations and user experience tests were conducted, and I conducted in-depth research on alignment methods for printing and cutting.

Child’s Bookshelf

This bookshelf is primarily designed for children aged six to twelve who are in elementary school, aiming to cultivate good habits of organizing and arranging their books. The overall design takes into account the height of 12-year-old children to ensure it meets their usability needs. Throughout the design process, I not only considered the dimensions of the books but also emphasized the interior space design of the cabinet. The cabinet doors feature magnetic panels that can easily attach to the compartments.

In the manufacturing process, I applied spray paint and brushed wood wax oil, ensuring a smooth surface through repeated polishing. Careful consideration was given to utilizing nearly a perfect 48 by 48 inches composite board, achieving a highly economical and practical design outcome.