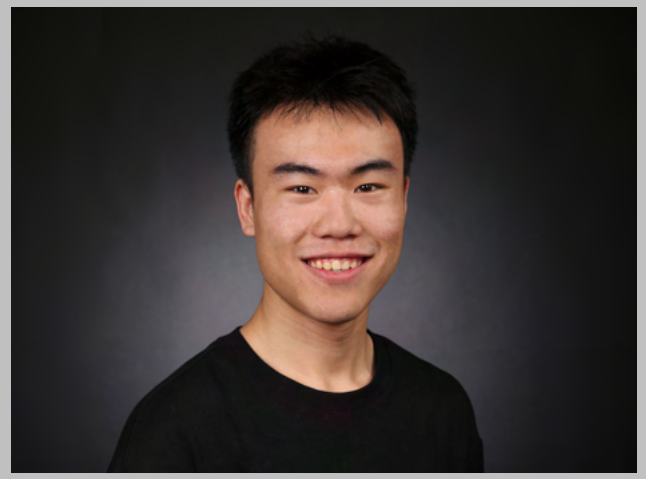


Portfolio

Shumo Wang | Parsons School of Design
Product Design Major & Communication Design Minor

Hello
I'm Shumo



Driven by spatial visualization and detail, I use CAD to translate complex visions into reality. I view design as a universal language and prioritize versatility over limitation, crafting everything from large scale architecture to the intimate objects we hold every day.

Software Skills

- SolidWorks
- Fusion360
- Gravity Sketch
- Keyshot
- Photoshop
- Illustrator
- InDesign
- Acrobat Pro
- Kiri Engine

Experience

RESEARCH ASSISTANT
Parsons School of Design | Apr 2026 - May 2026

Collaborated under a product design professor, focusing on inclusive and sustainable design tools. Addresses the pedagogical gap between small size patterns and the average US female size 18 by designing low cost, plus size, and sustainable dress forms. Engaged in developing optimization and improvement solutions for existing mold production.

Contact

WEBSITE Shumo.Studio
EMAIL shumo.wang@outlook.com
LINKEDIN Shumo Wang

01



Fulcrum

BRIDGE INSPECTION & MAINTENANCE DRONE

DURATION 7 weeks
YEAR 2026

PROJECT TYPE Collaborative / 2 Person
COLLABORATOR Tsunemasa Fujiwara

SOFTWARE USED

BACKGROUND

In the US over **120 fatal injuries** occur each year when inspecting or cleaning bridges.

Main causes of these injuries



Fatal Falls and Heights



Physical Hazards



Environmental and Site Conditions

Operational costs

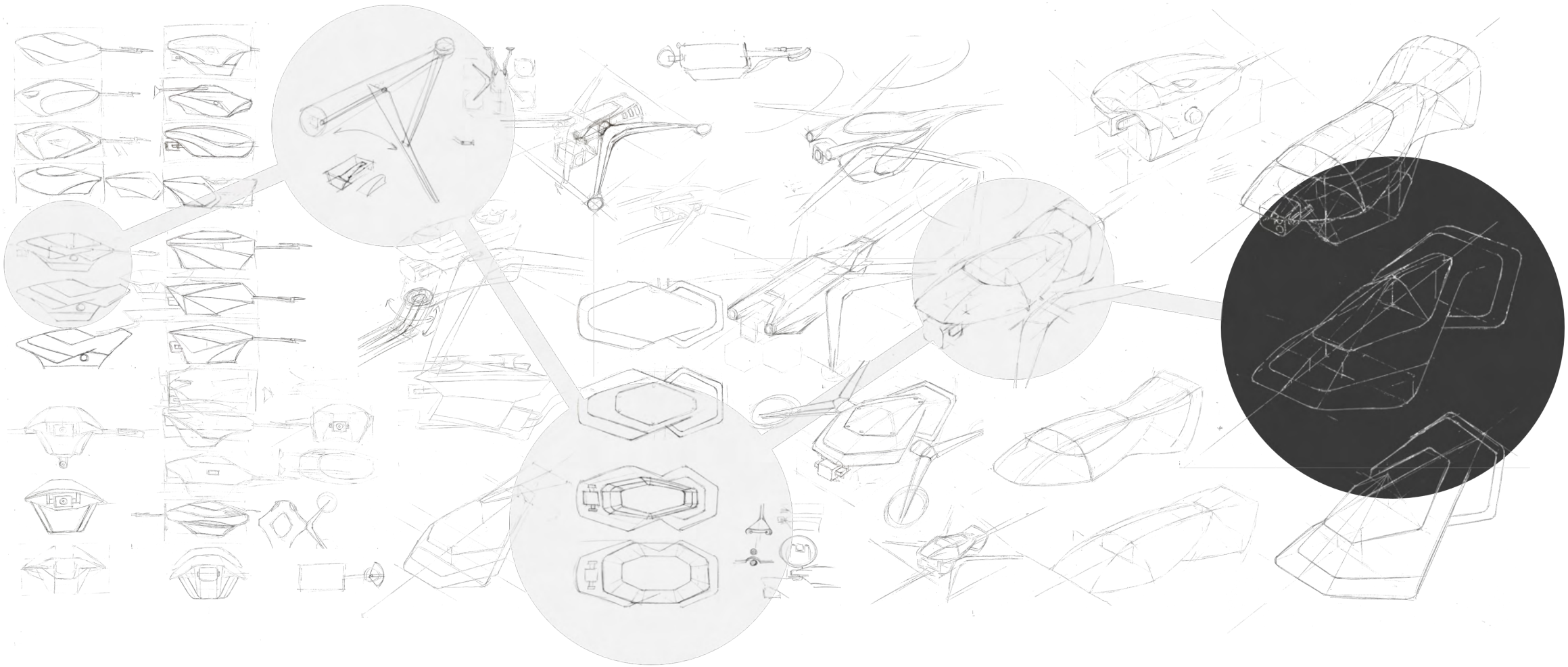
Roughly **$400,000** to implement each snooper truck

Currently requires **3-4** workers to be onsite



SKETCHES

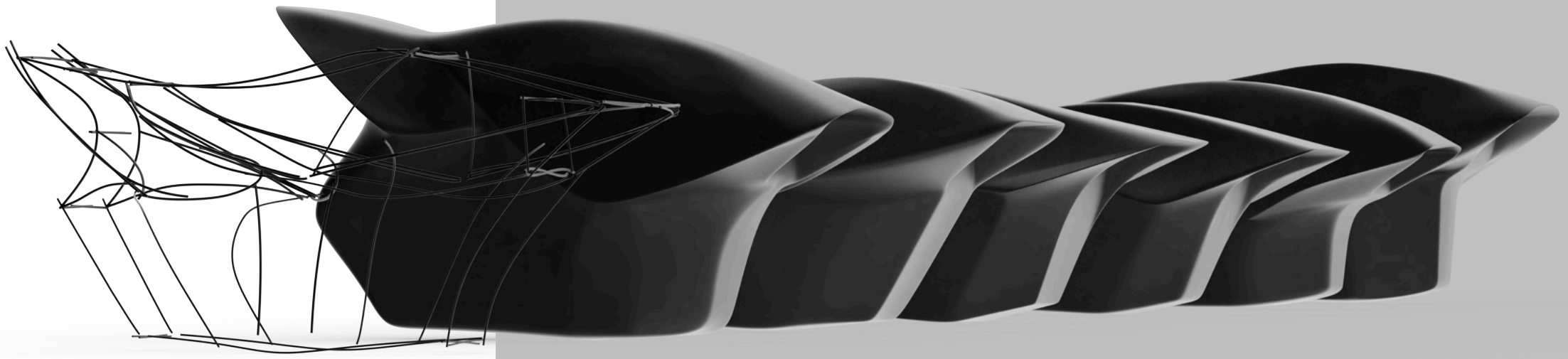
Exploring purposeful forms and structural design languages that stand out.





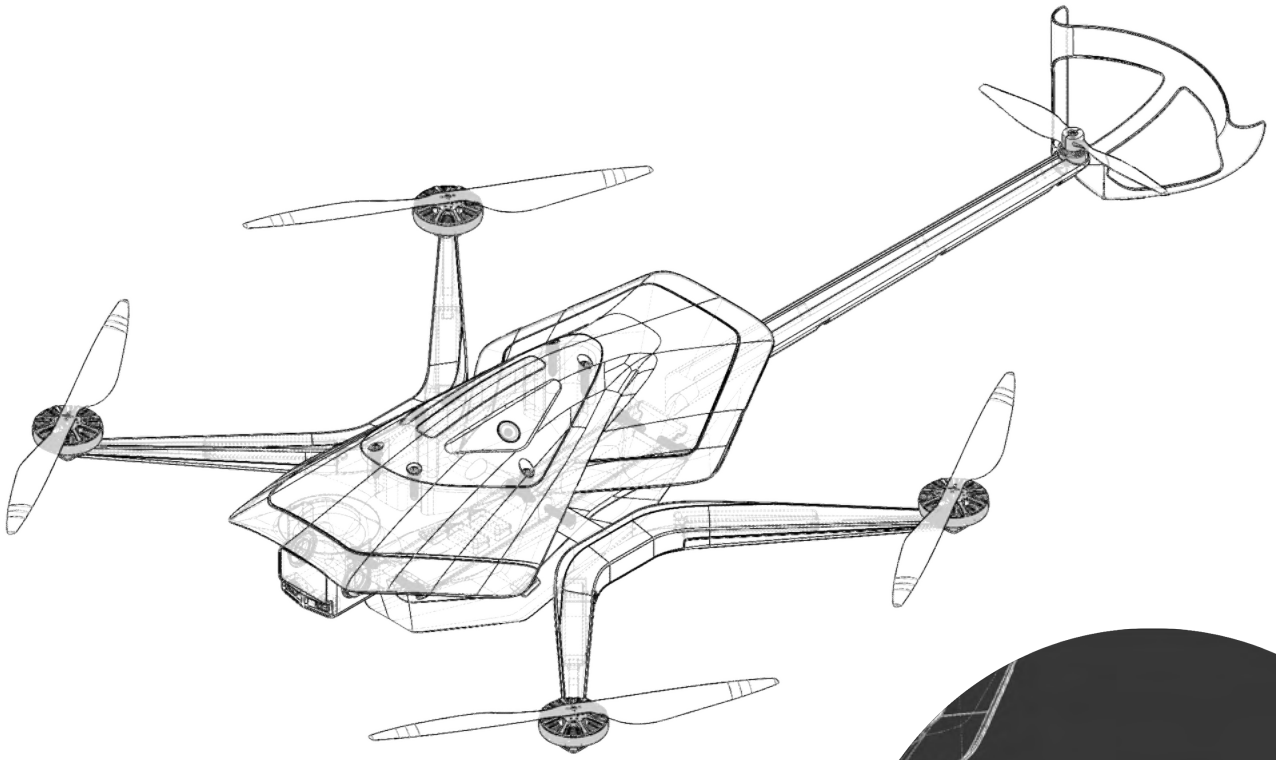
DEVELOPMENT

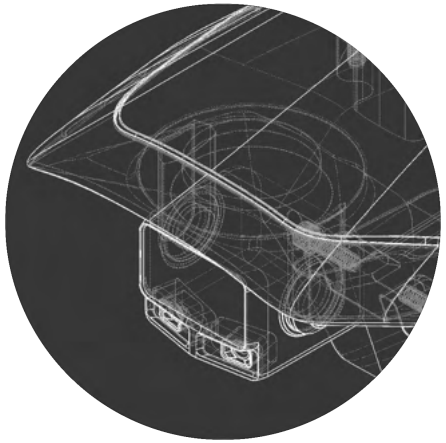
Utilizing a shared VR modeling environment allows our team to collaborate seamlessly. Maximizing workflow efficiency to quickly generate concepts, rapidly prototype, and arrive at the optimal design.

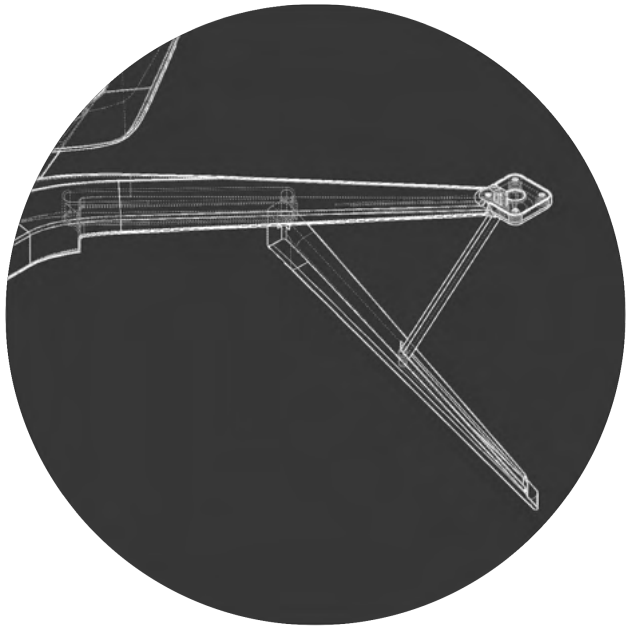


CAD MODELING









MODULAR DESIGN





Built with a highly versatile **modular architecture**. This allows a single platform to rapidly swap from

LiDAR inspection array to
high pressure water gun or
suction cup module

based on mission requirements.

TWO+ CONFIGURATIONS

Inspection Configuration



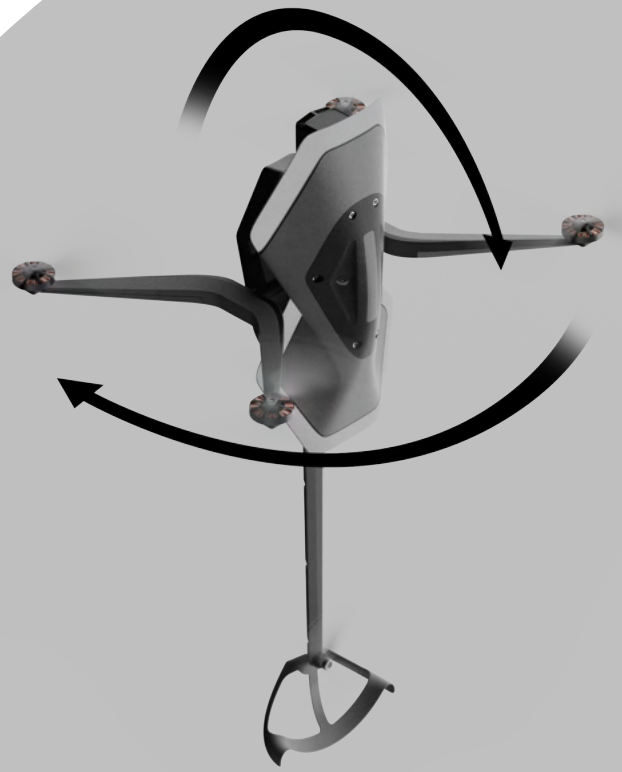
Maintenance Configuration





THE DRONE

The drone's advanced **360° rotational mobility** enables a full **6DoF** maneuvering envelope to decouple orientation from flight path and maximize active tool access on complex structures.



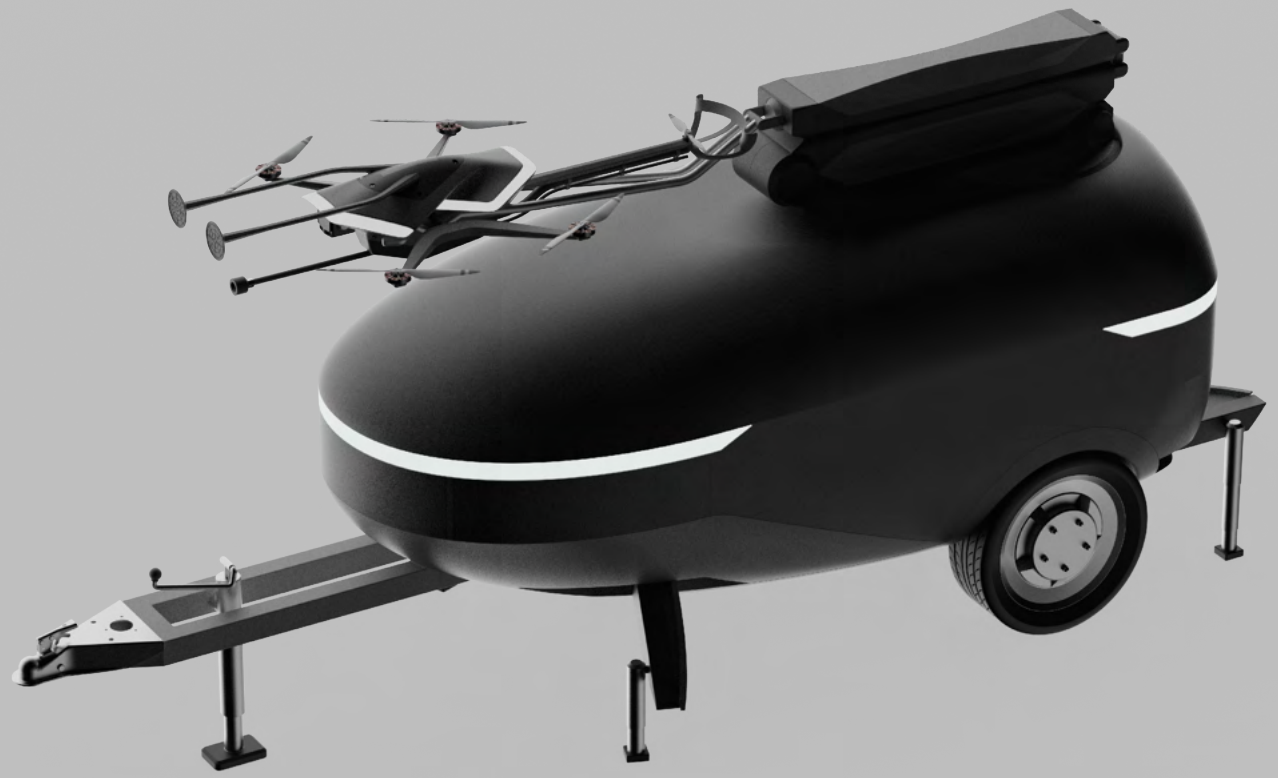
THE DRONE

An integrated, high pressure water jet module enables the drone to perform targeted, focused cleaning operations for efficient bridge maintenance.



THE VEHICLE

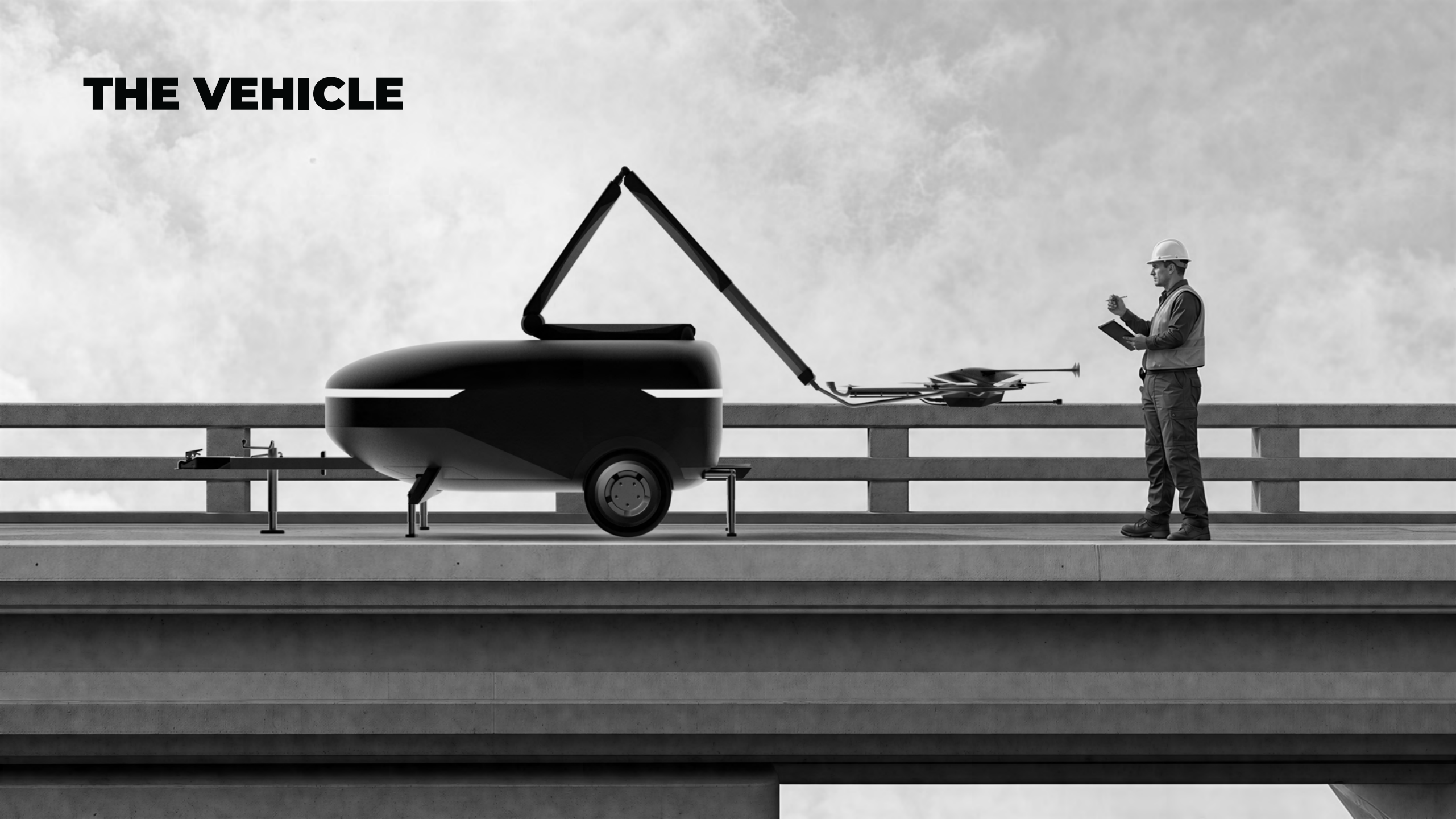
Serving as a secure landing pad during transit, this vehicle houses the main **water reservoir** and **power supply** to sustain maintenance operations. Its i**ntegrated mechanical arm** automatically deploys the drone under bridge structures and lowers it to an optimal height for ground personnel. This allows the team to rapidly swap accessories safely and efficiently between missions.





Featuring a **standardized tow hitch**.
The trailer seamlessly pairs with a company's **existing utility trucks**, eliminating the need for a specialized vehicle purchase to drastically reduce **upfront capital expenditures**.

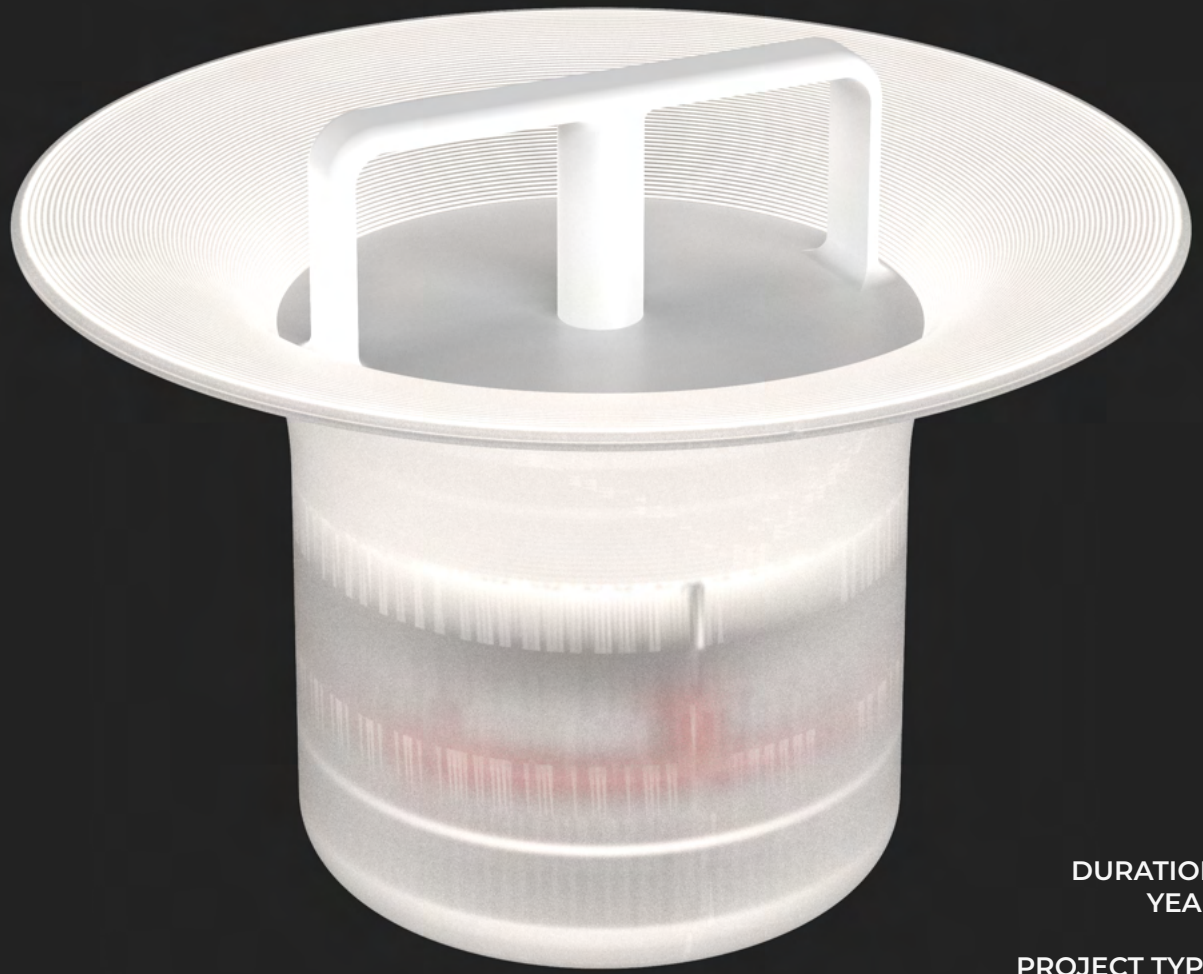
THE VEHICLE



02

Flora

DISASTER RESILIENT DESIGN



DURATION 6 weeks
YEAR 2025

PROJECT TYPE Individual

SOFTWARE USED

DISASTER TO ADDRESS

30 Typhoons

Annual Average
The Northwest Pacific basin generates a massive volume of storms each year, maintaining a constant threat of extreme weather.

1/3 Global Share

Meteorological Focus
The region accounts for roughly one third of all global tropical cyclone activity, heavily concentrating risk along vulnerable coastlines.

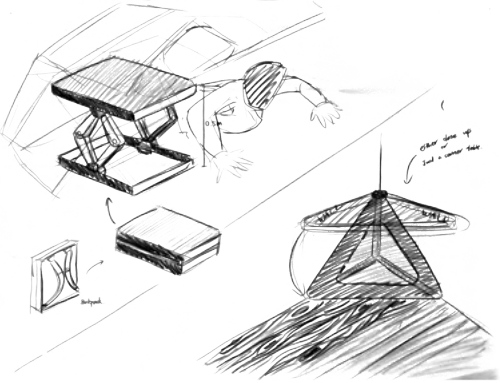
7.73B CNY

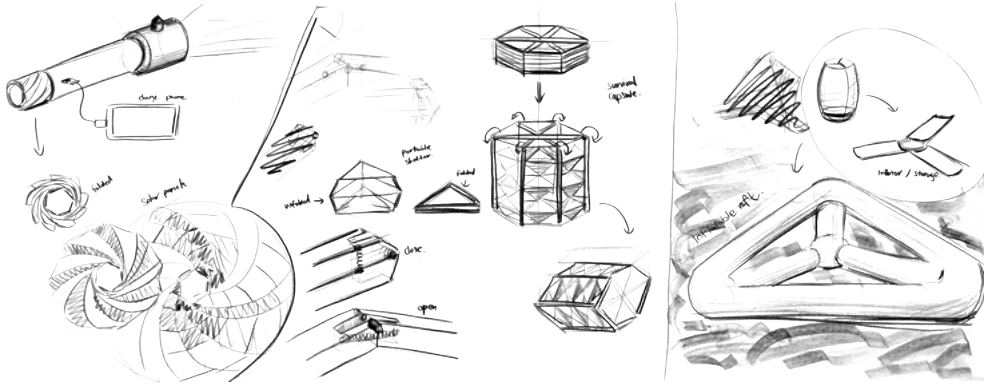
Economic Impact
Zhejiang province suffers the highest financial and structural losses per storm in the region, with severe landfalls crippling local power grids.

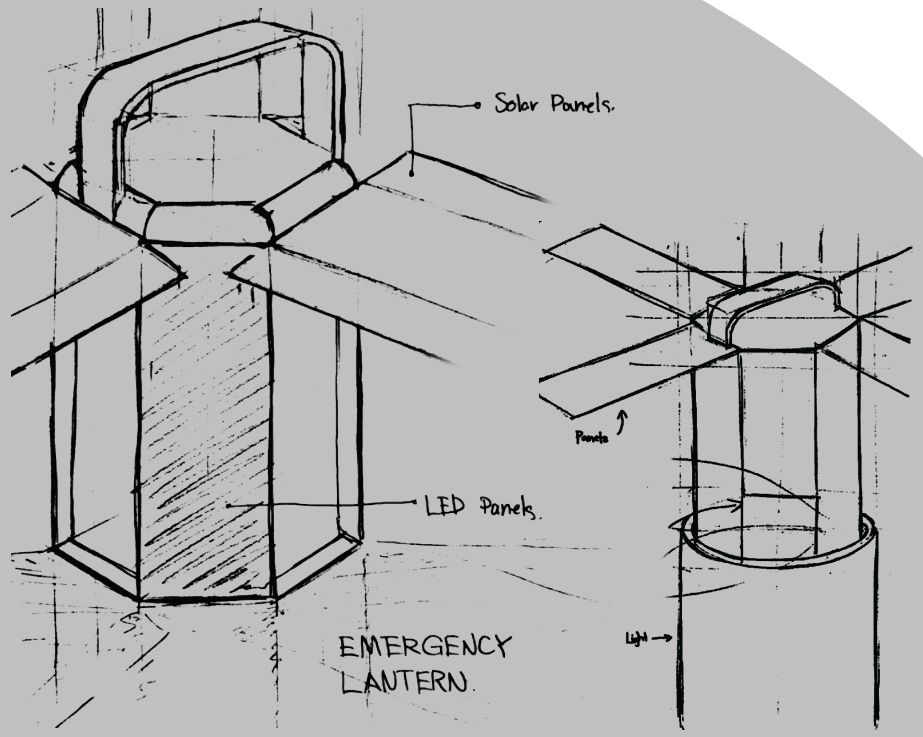


SKETCHES

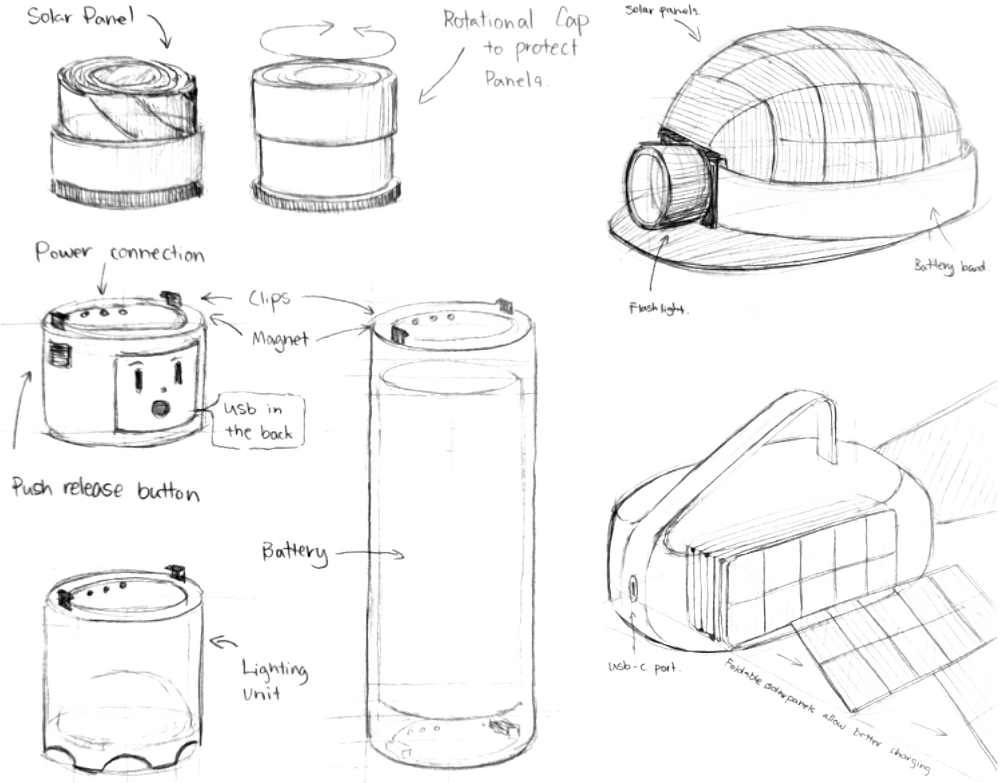
Rapid ideation and brainstorming aimed at discovering disaster relief product.





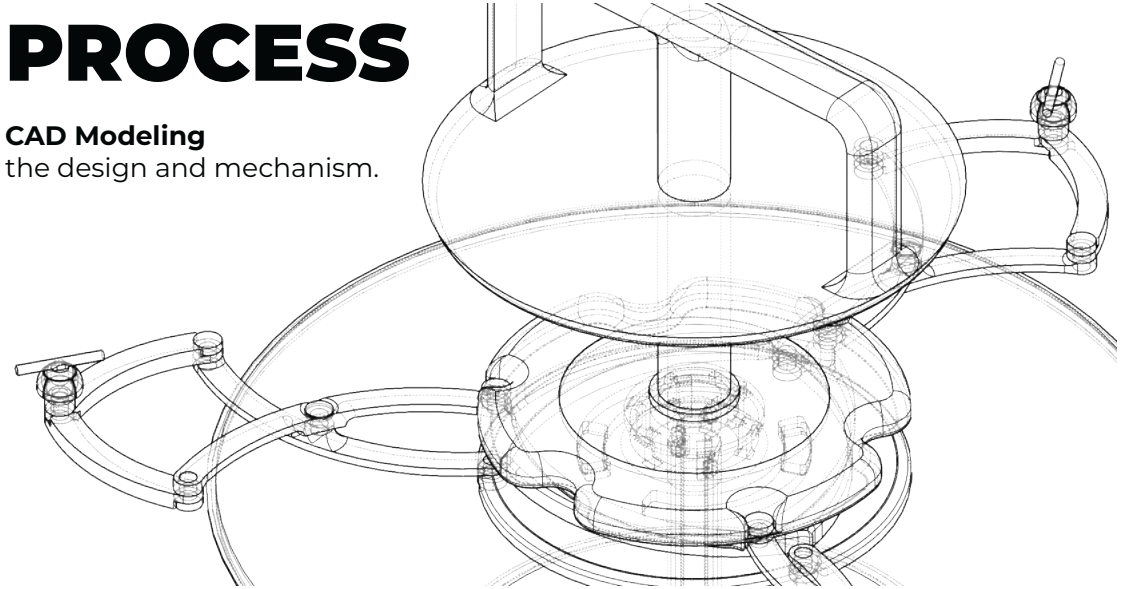


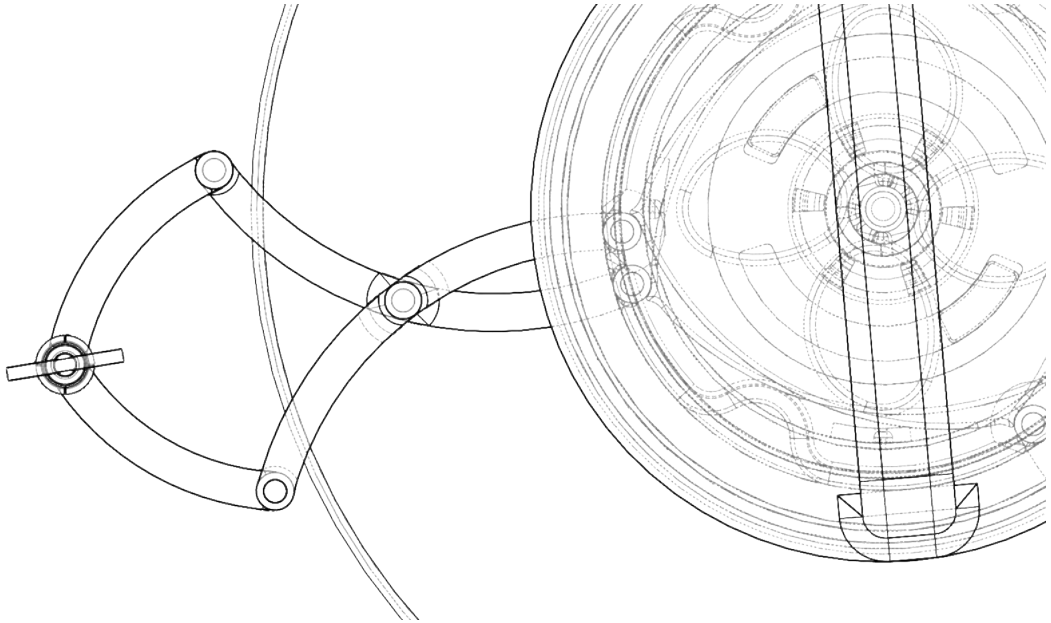
Early Sketches & Concepts



PROCESS

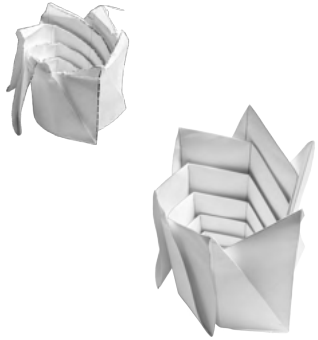
CAD Modeling
the design and mechanism.

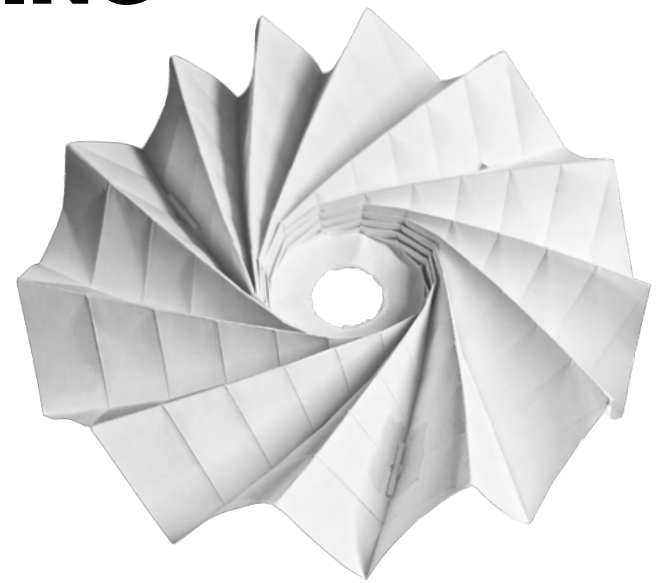




PROTOTYPING

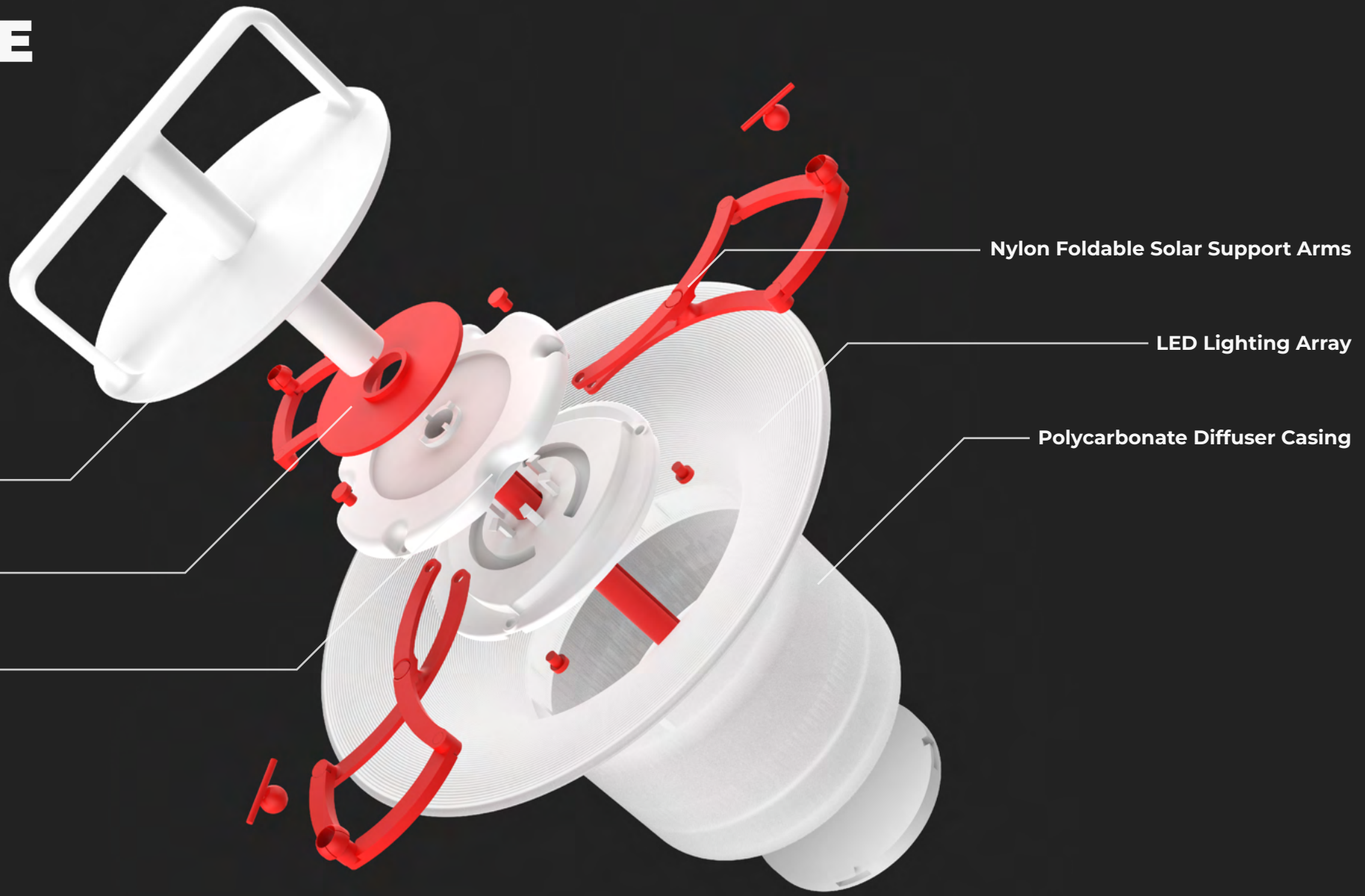
Physical Modeling
with paper folding and 3D printing.



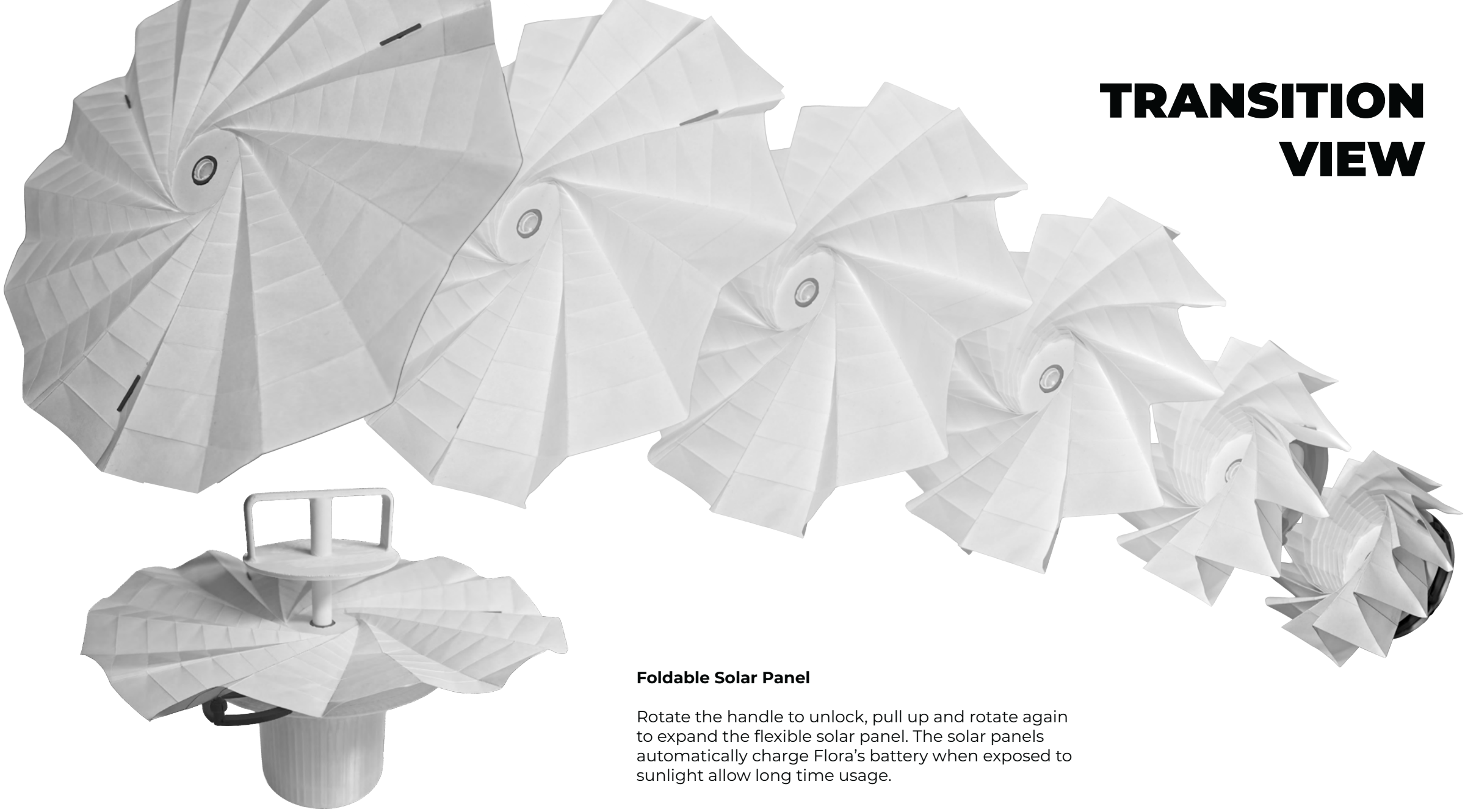




EXPLOSIVE VIEW



TRANSITION VIEW

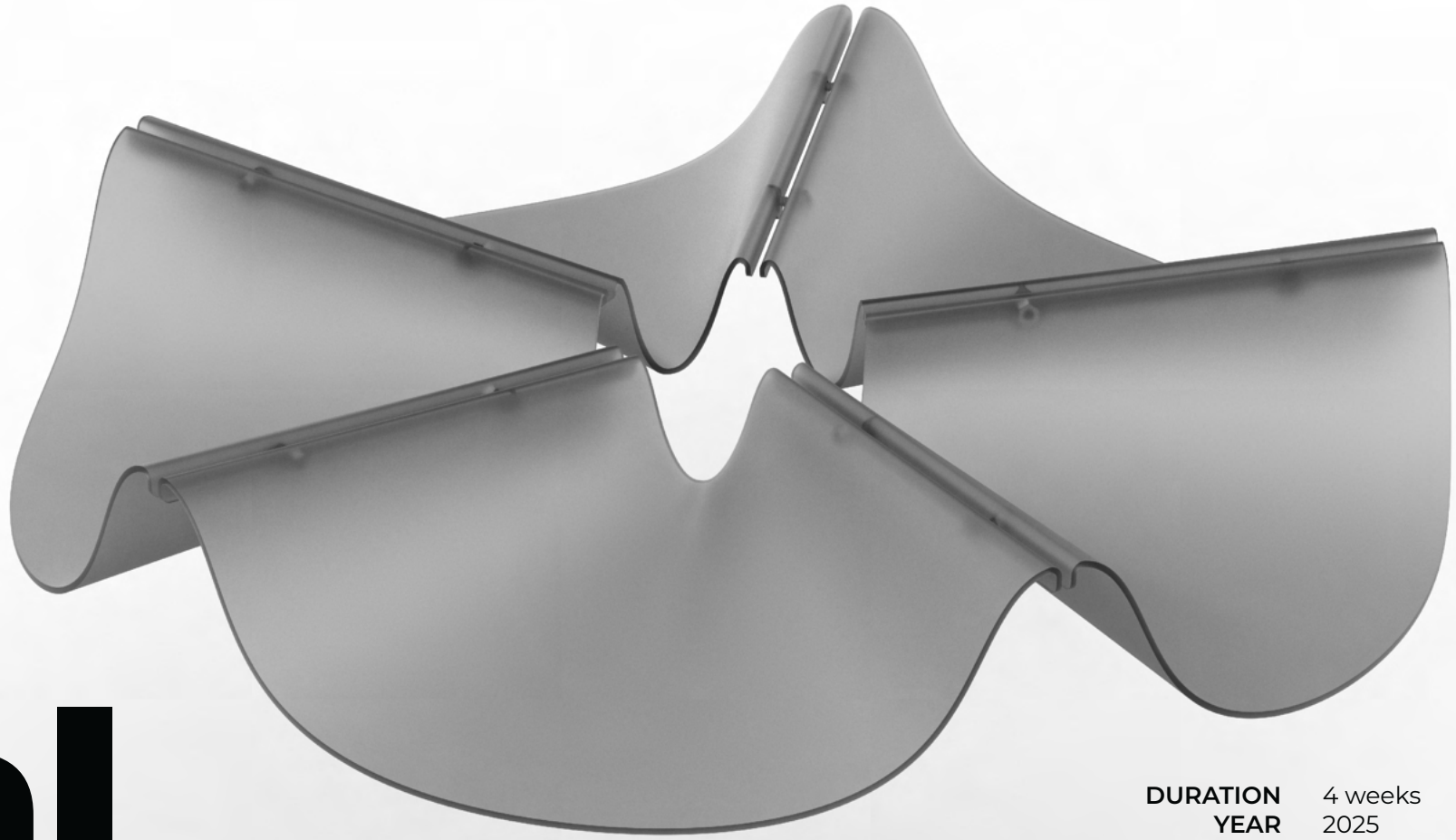


Foldable Solar Panel

Rotate the handle to unlock, pull up and rotate again to expand the flexible solar panel. The solar panels automatically charge Flora’s battery when exposed to sunlight allow long time usage.


RELIEVING / CAMPING

03



Petal

A NEW CONCEPT FOR SUBWAY STATION SEATING

DURATION	4 weeks
YEAR	2025
PROJECT TYPE	Individual
SOFTWARE USED	SW Ps

BACKGROUND

The Crisis: Metal leaning bars create a severe accessibility gap for elderly, pregnant, and disabled passengers who require actual physical rest, effectively turning a routine transit wait into an exhausting physical barrier.

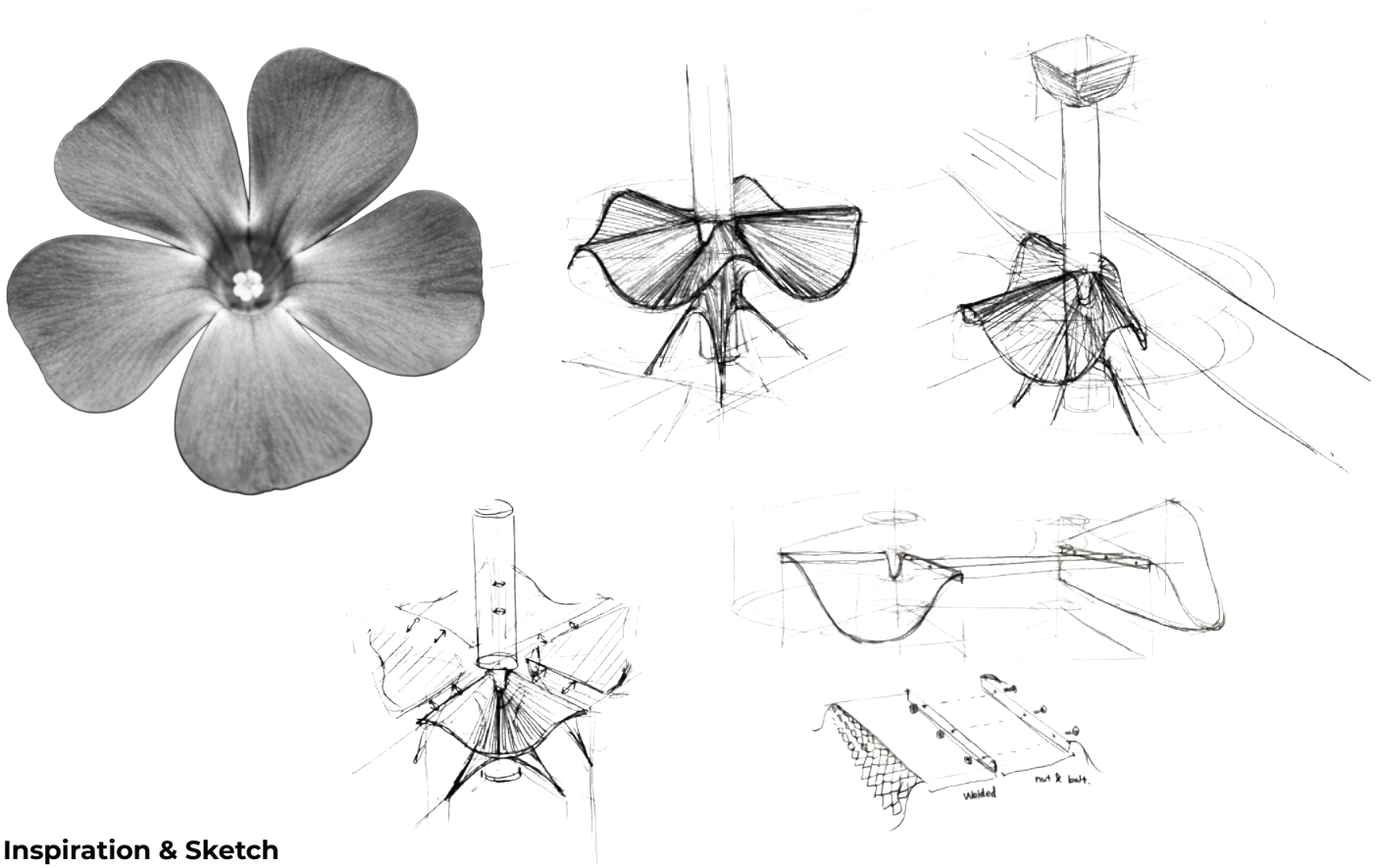




The Intervention: A modular seating system that integrates directly with existing station infrastructure to restore human equity while naturally preventing long term loitering.

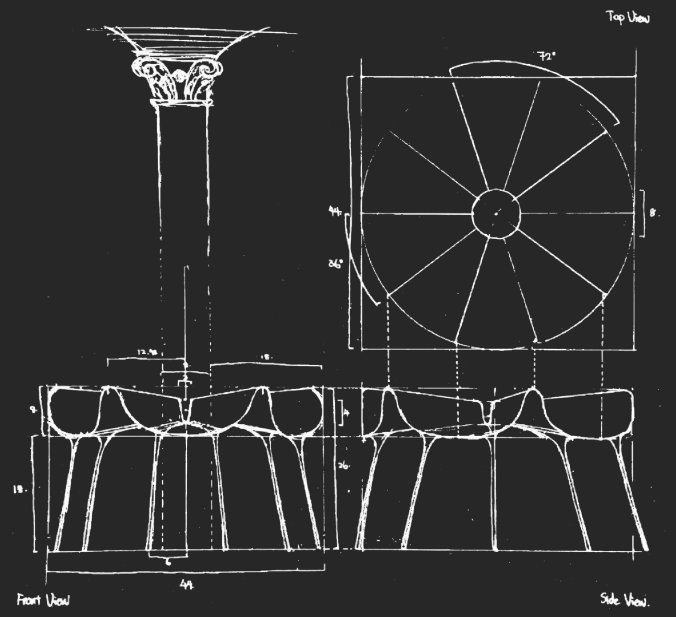
CONCEPT

Translating botanical radial symmetry into clear personal boundaries. The organic form provides a natural blueprint to subtly partition individual seating zones around a centralized pillar, preventing overcrowding while maximizing perimeter utility.



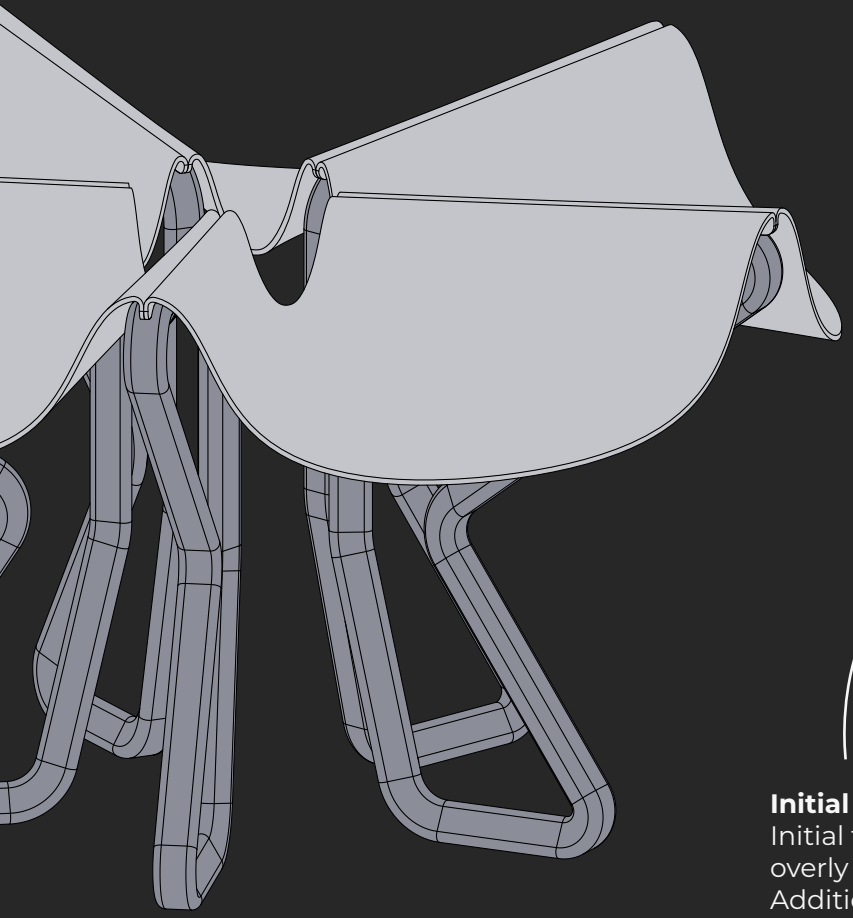
Inspiration & Sketch

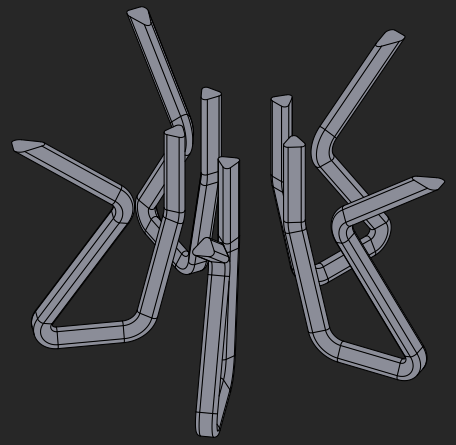
DEVELOPMENT



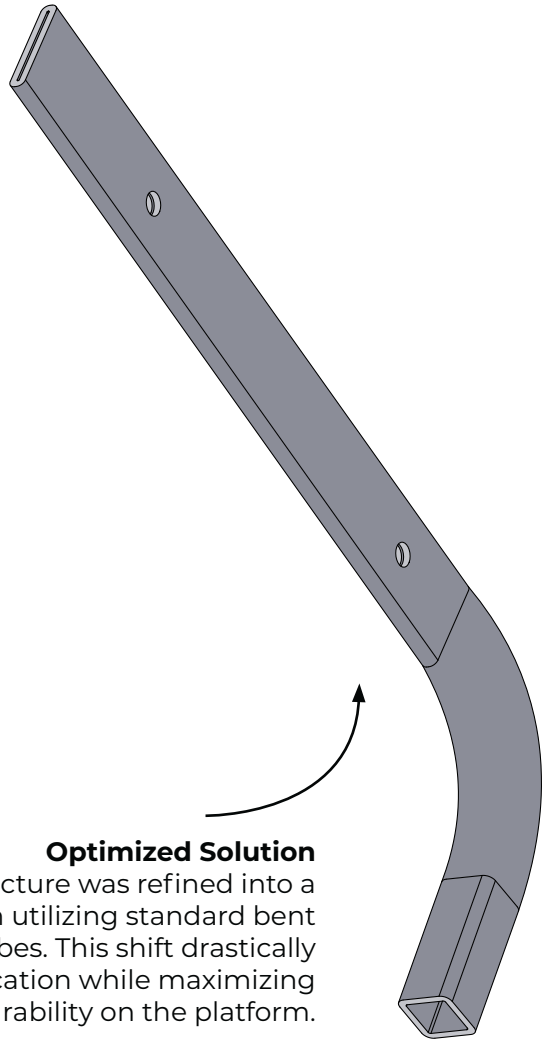
Orthographic Plan

DESIGN PROGRESS



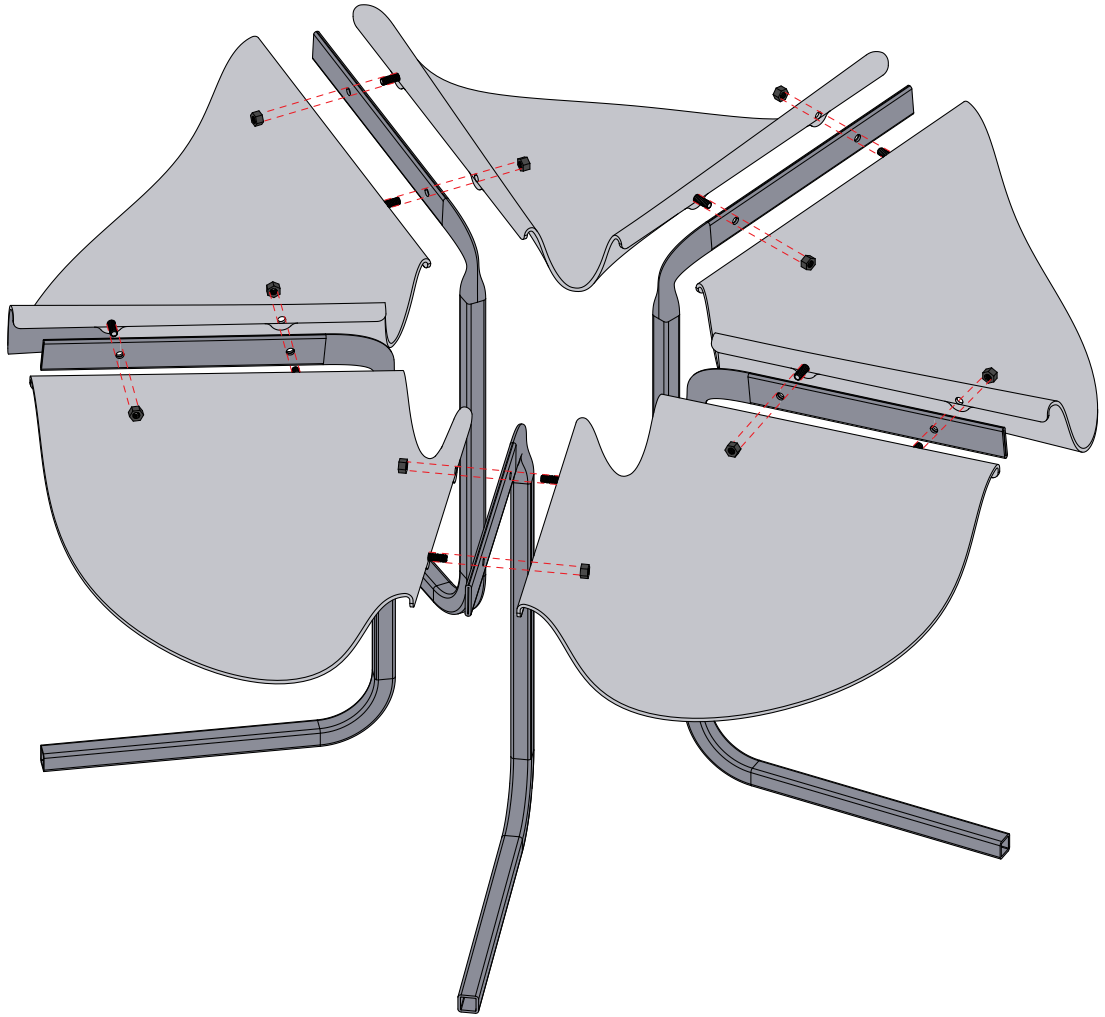


Initial Flaws
Initial triangular leg geometries proved overly complex, driving up production costs. Additionally, the configuration lacked the required stability for high-traffic transit environments.



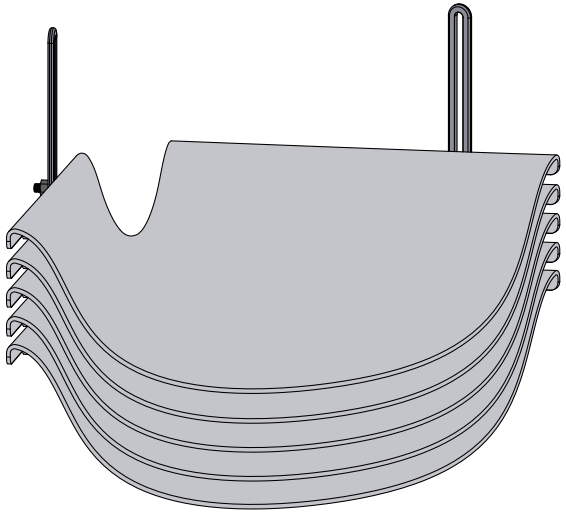
Optimized Solution
The architecture was refined into a streamlined form utilizing standard bent square profile tubes. This shift drastically simplifies fabrication while maximizing structural durability on the platform.

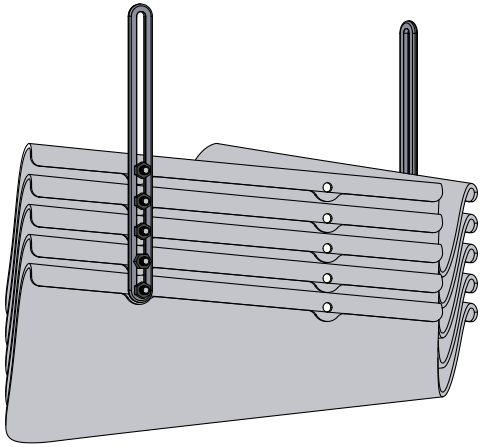
DESIGN DETAILS



Comprising **just 20 components** and requiring only a wrench for installation, the Petal system utilizes intuitive joints and minimal connection points to ensure rapid assembly and efficient maintenance.

Petal's **stackable architecture** utilizes a dedicated connector to secure units, optimizing transport efficiency and reducing the shipping footprint.



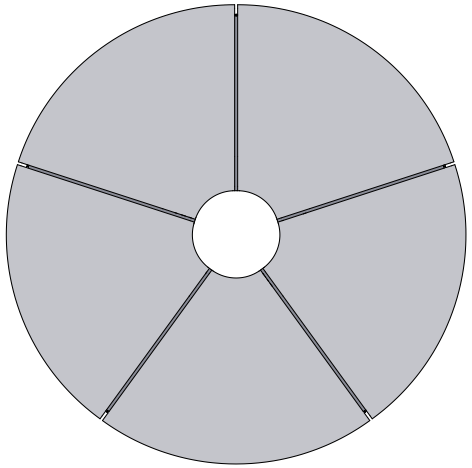


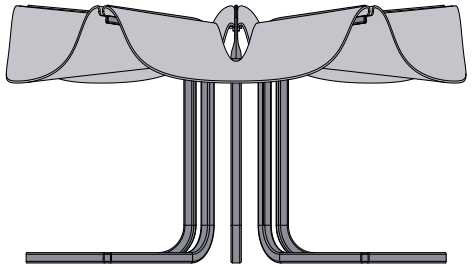
FINAL DESIGN

The dimensions of the fully assembled Petal is approximately:

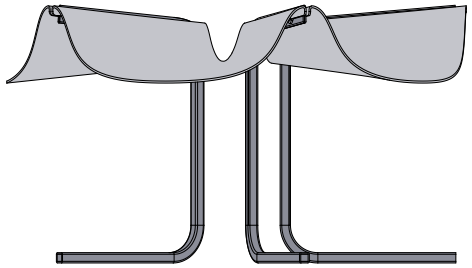
44.5 in x 44.5 in x 25 in

Top View





Front View



Side View

MONO MATERIAL

Constructed entirely from stainless steel, this design combines a perforated sheet metal seat with bent square-profile legs to balance manufacturing simplicity with the rugged durability required for public transit environments.



ON SITE RENDERING



04

Undull

ERGONOMIC KNIFE SHARPENER



DURATION 8 weeks
YEAR 2025

PROJECT TYPE Individual

SOFTWARE USED

PROBLEM



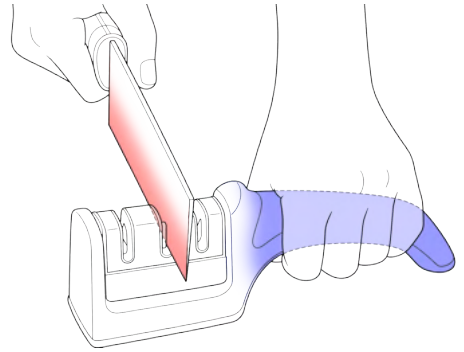
Knife related injury rate 1.56 injuries per 1000 US residents per year.

- High injury rates linked to dull or damaged blades.
- Market tools that scrape and damage the edge rather than sharpen.
- Complex setups with steep learning curves and user safety risks.

ANALYSIS

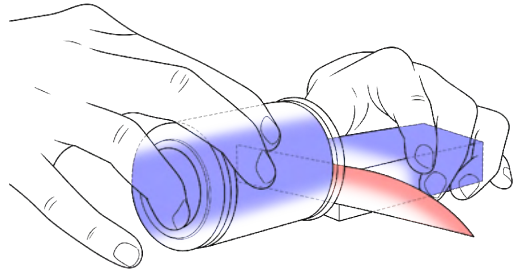
Product Type A

- Distal grip positioning provides basic clearance.
- Ergonomics restricted for varied hand sizes.
- Safe, downward-facing blade orientation.



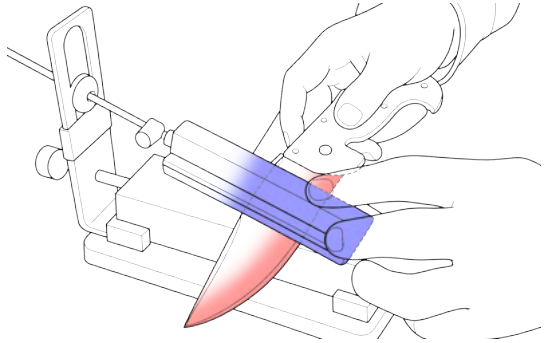
Product Type B

- Absence of dedicated ergonomic grip.
- Trade off between hand proximity and stability.
- High-risk, upward-facing blade orientation.



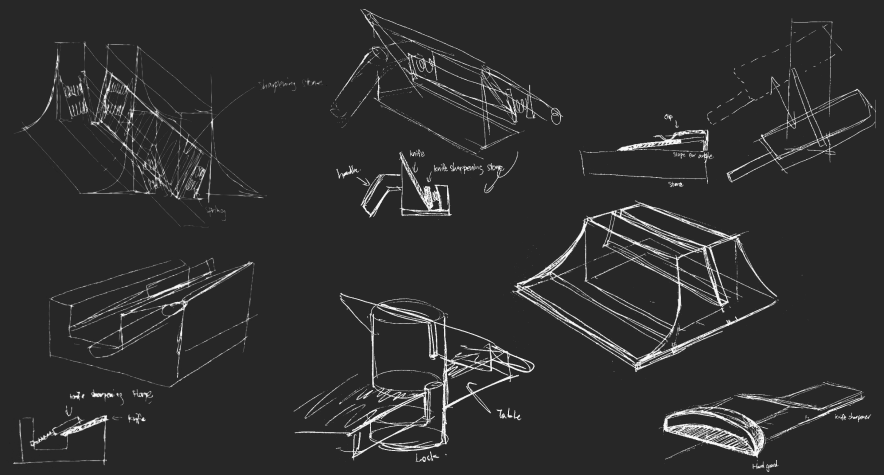
Product Type C

- Extreme proximity with motion toward the edge.
- Lack of integrated structural safety barriers.
- Dangerous, direct user-facing blade orientation.



FORM FINDING

Sketches



Models

A



B



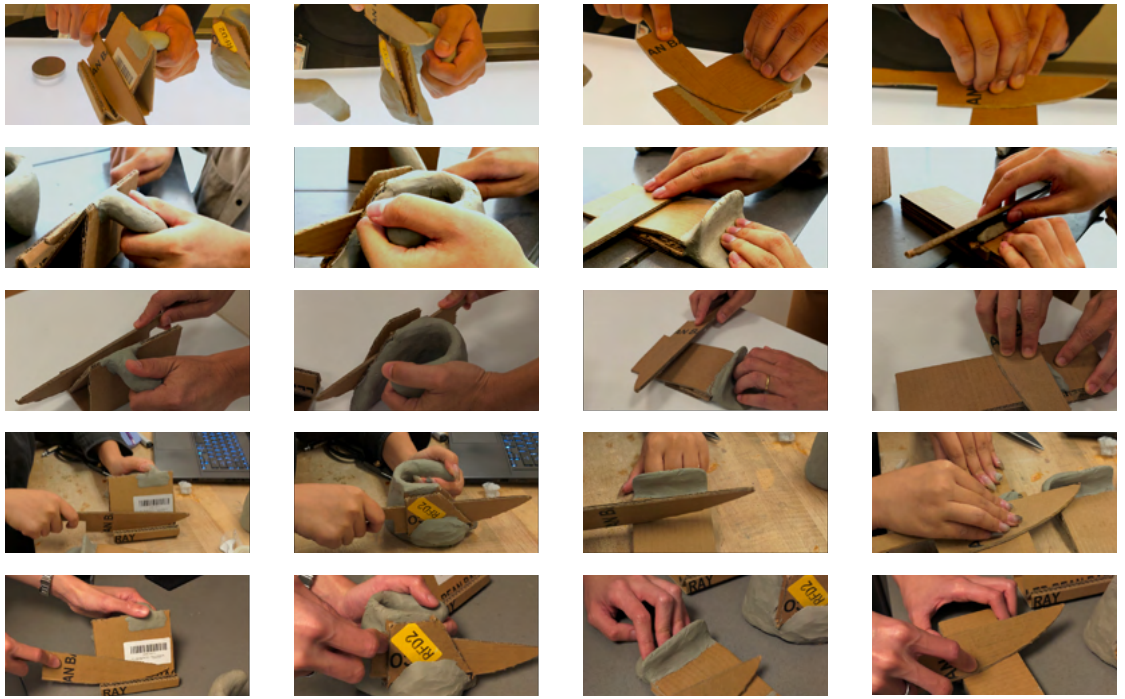
C



D



USER TESTING PT1



Design A

Pros:
Familiar handle shape. Quite comfortable.
Easy to use.

Cons:
Only sharp one side of the blade.

B

Pros:
Familiar handle shape. Very comfortable. Easy to use.
Sense of safety.

Cons:
This shape might be confusing.

C

Pros:
Similar as cutting.
Good protection.

Cons:
Only sharp one side of the blade.

D

Pros:
Minor addition to existing product.
Easy to use.

Cons:
Not for all users.
Bad grip.
Need some kind of support.

USER TESTING PT2

Design B's ergonomic familiarity was advanced into a second testing phase using four clay models to isolate critical handle variables. Testers evaluated these configurations in randomized sequences to eliminate bias and lock in the safest proportions.



Variant A

Handle space:
Narrow

Overall Height:
High

Back Height:
High

Pinky Rest:
Without

B

Handle space:
Open

Overall Height:
Low

Back Height:
Low

Pinky Rest:
Without

C

Handle space:
Open

Overall Height:
High

Back Height:
Low

Pinky Rest:
With

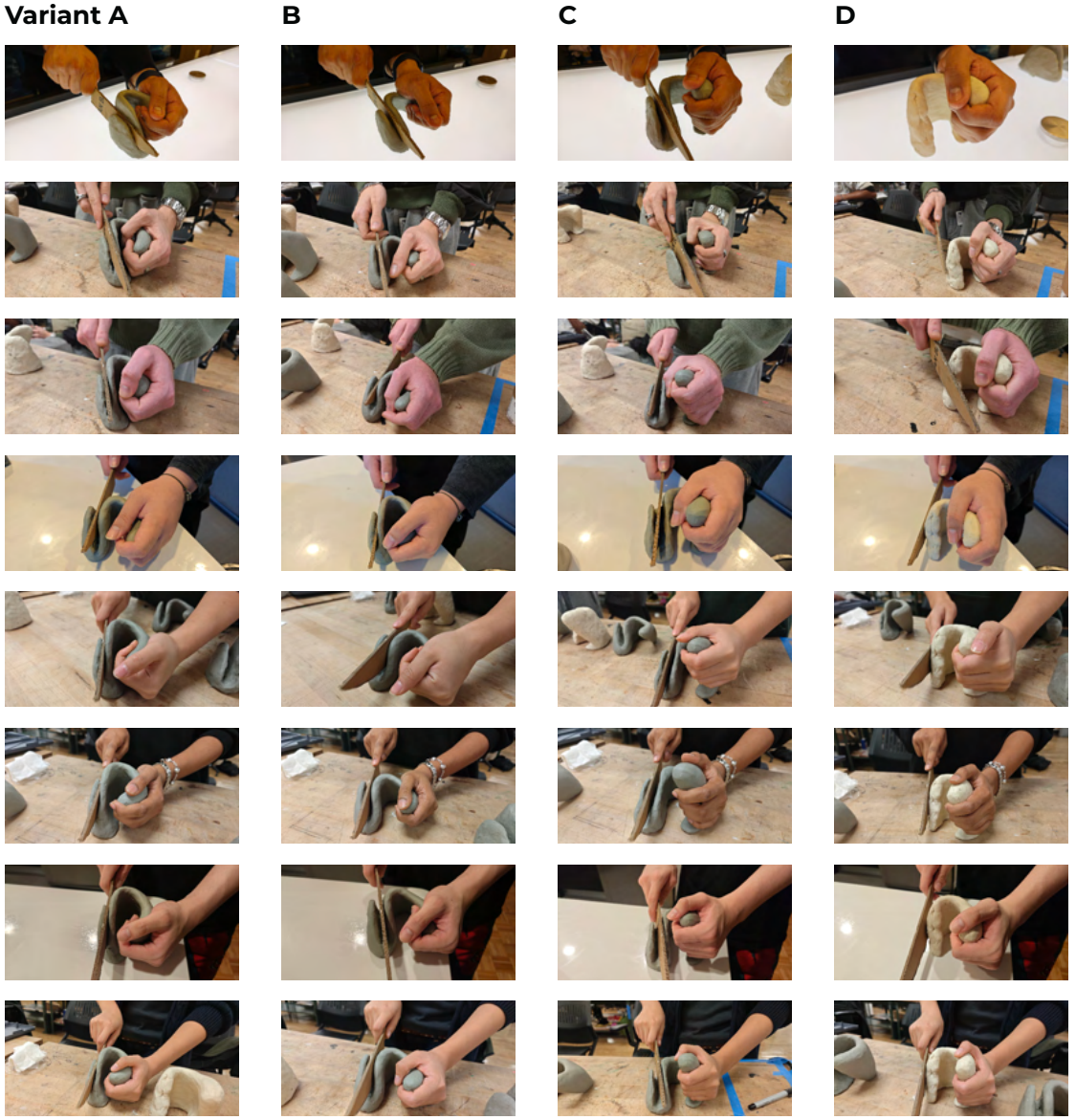
D

Handle space:
Open

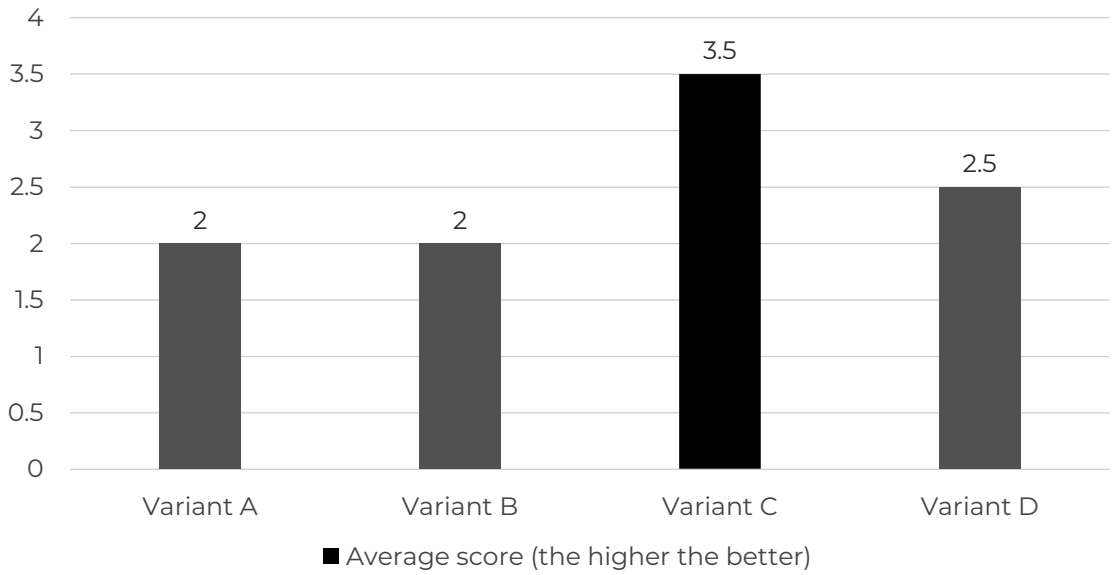
Overall Height:
High

Back Height:
High

Pinky Rest:
With



RESULTS





Handle Space

Maintain a safe space between handle and knife sharpening section.



Handle Front

Be taler and relatively larger, for better grip.



Pinky Rest

Pinky rest to counteract downward force, and comfort.



Handle Back

Declining back of the handle for better grip and comfort.

DEVELOPMENT

Further refine the shape and utilizing LiDAR scanners to get the final form digitally.



Earlier Versions **Later Versions**

87.5% Satisfaction Rate With User Testing Pt3





FINAL RENDER



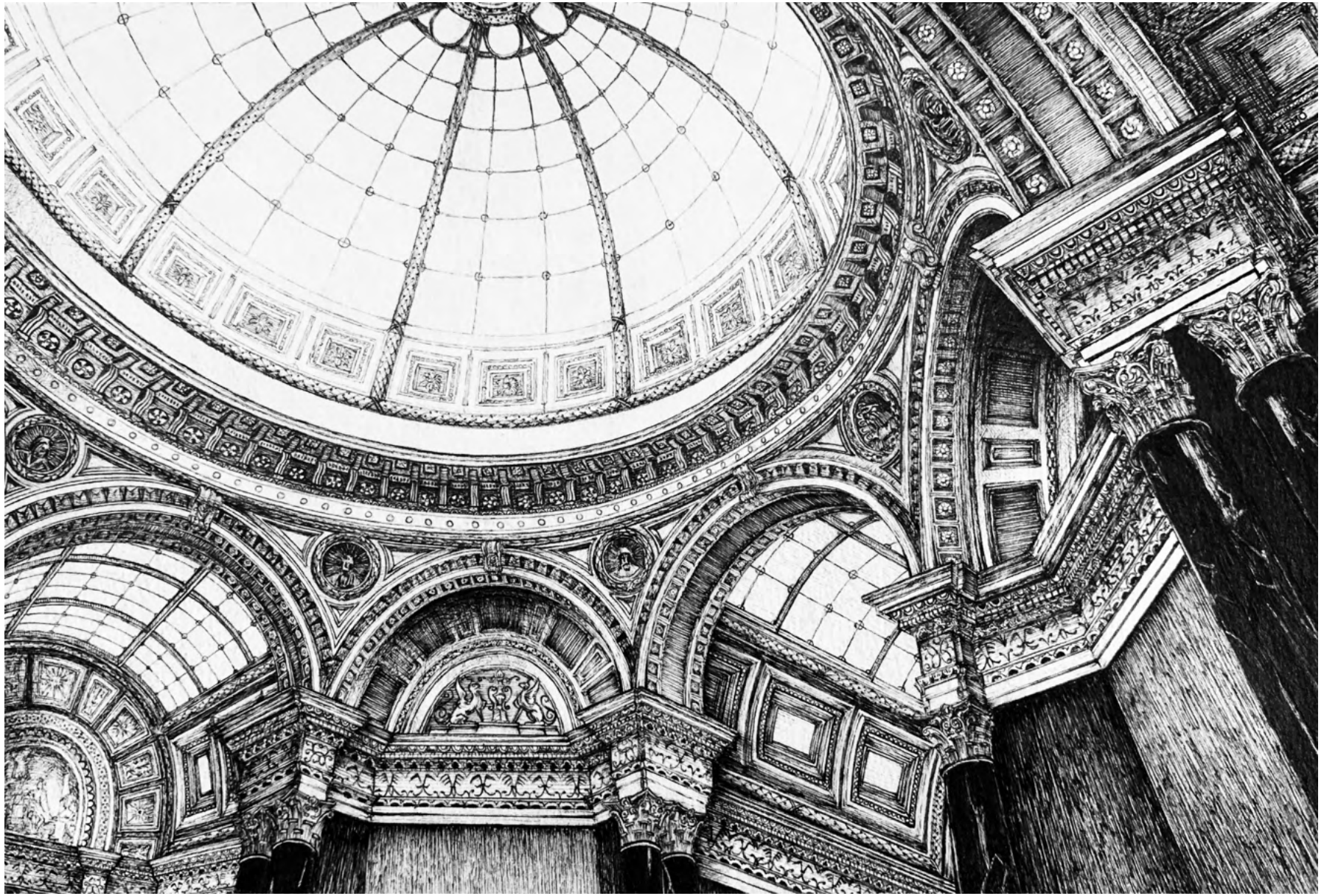






Artworks

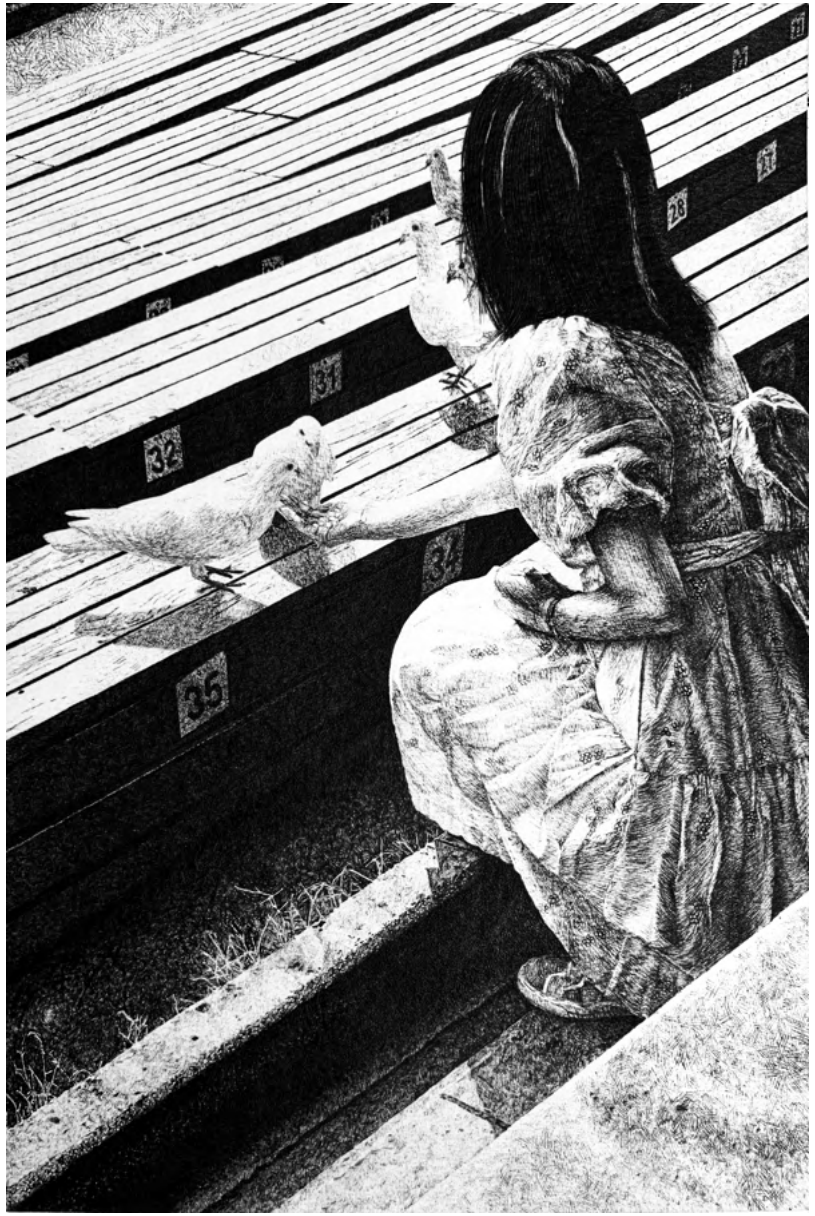
2023 - Now



The National Gallery

21 x 14 cm

Fineliner on Paper



Untitled

14 x 21 cm

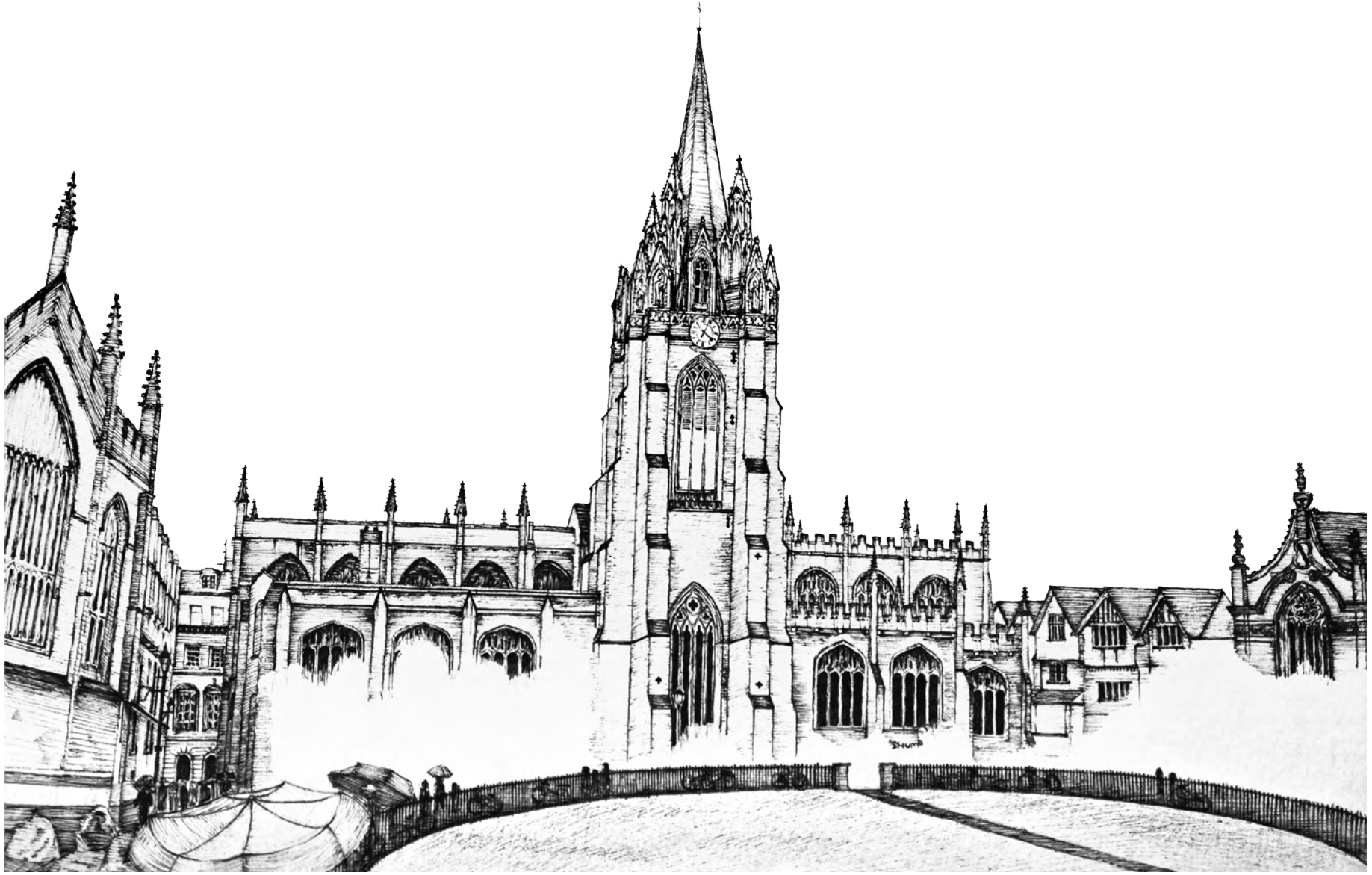
Fineliner on Paper

Cathedral of Santa Maria del Fiore

16 x 14 cm

Fineliner on Paper





Oxford

21 x 14 cm

Fineliner on Paper



Untitled

14 x 8 cm

Fineliner on Paper

The Campbell Sisters Dancing a Waltz

21 x 14 cm

Fineliner on Paper





Thank You.

Website Shumo.Studio
Email shumo.wang@outlook.com
LinkedIn Shumo Wang