

Portfolio

Industrial Design

Kiefer Howland

2025

Overview

- 01
- 02
- 03
- 04

Pin Up Panel 01

Manufacturing



Weather Predictor 02

Form



Tamper-Detection 03

Digital Visualization



Circadian Clock 04

Research



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PUP

Mobile Pin Up Panel

Pin-Up Panel is a modular partition system designed to transform studio spaces into flexible environments for collaboration, critique, and display. Created to enhance workflow in design education, it highlights my strengths in spatial design research, full-scale prototyping, and fabrication-driven problem solving.

15 Weeks | 3 Designers | Summer 2025



The College of Design's open-studio layout encourages collaboration but limits wall space, prompting the need for a **flexible, portable system to support frequent pin-ups and critiques.**

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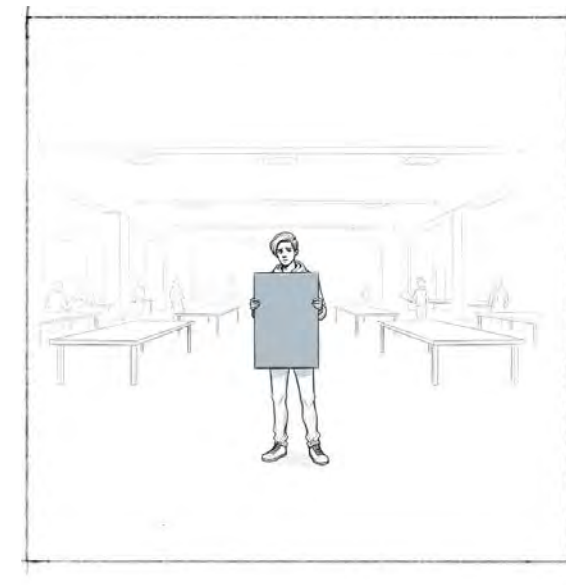
04



You work hard on a project



Want to show it and get feedback



But there's nowhere to pin it up



Project

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Ghent EZ Mobile Whiteboard

Magnetic
Whiteboard and Felt



Herman Miller OE1 Mobile Easel

Nesting stands
Replaceable panels



Ghent Pointe Mobile Glassboard

15 degree angled legs
Multiple units connect



Ghent Geo Mobile

Interior cavity for storage
A-frame design for stability



Project Intent

Design a **portable pin-up panel** that supports feedback and critique in the open-studio environment.

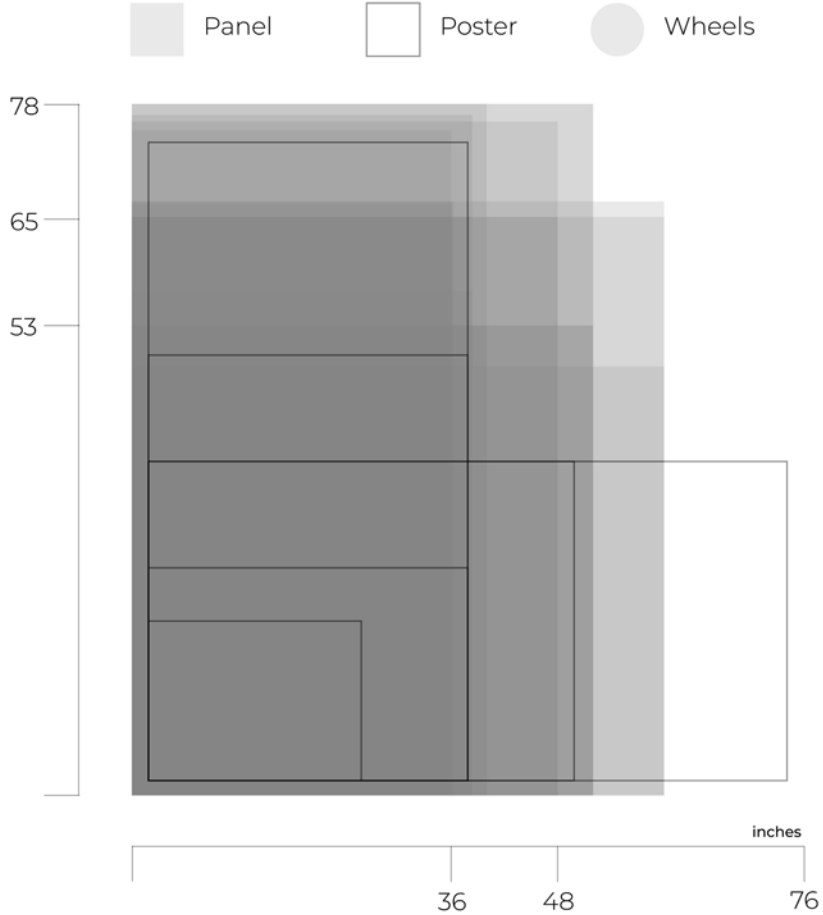
Project

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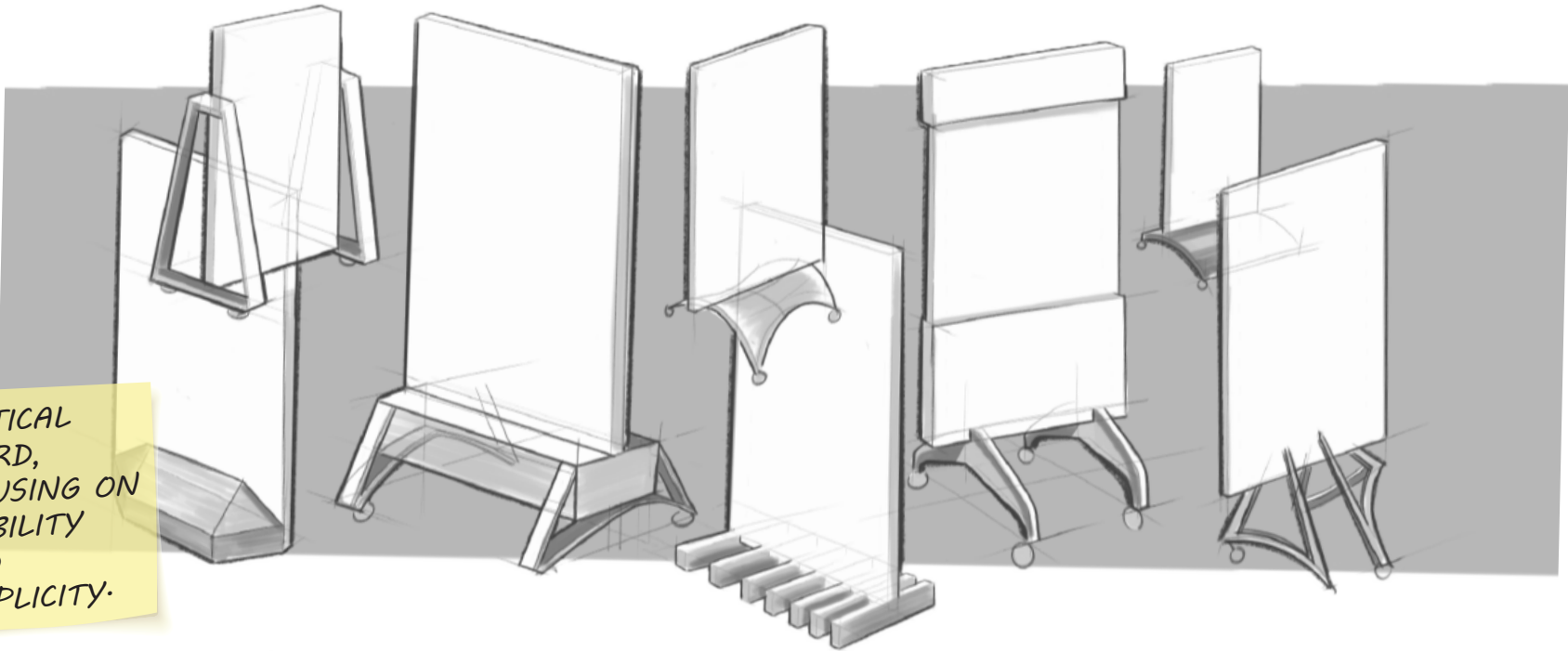
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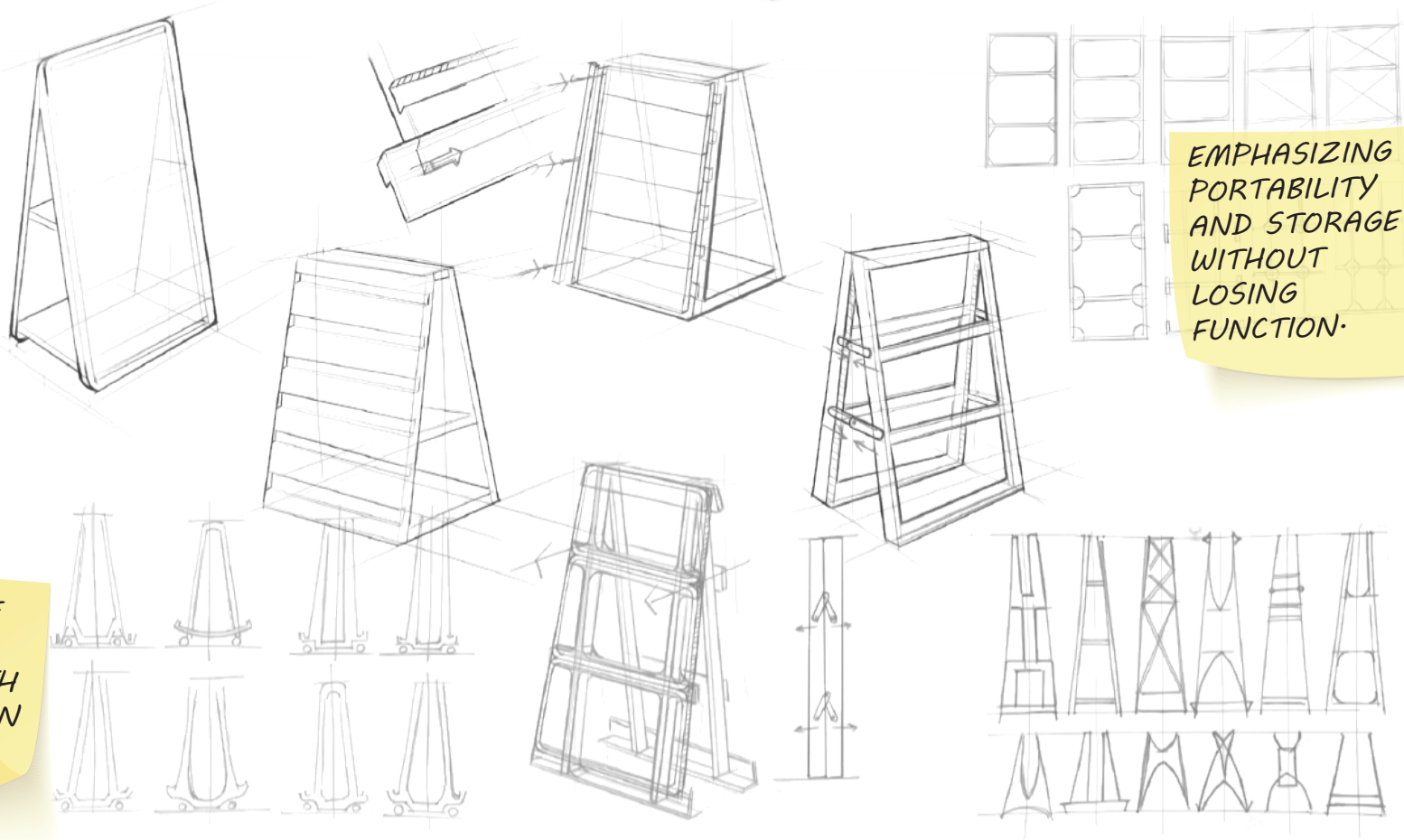
04



VERTICAL BOARD, FOCUSING ON VISIBILITY AND SIMPLICITY.



EMPHASIZING PORTABILITY AND STORAGE WITHOUT LOSING FUNCTION.



AN A-FRAME STRUCTURE REFINED WITH DURABILITY IN MIND.

The original sketches for the panel project were informed by a **survey on preferred poster sizing**, guiding proportions and layouts to match real user needs rather than arbitrary dimensions.

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The first iteration introduced a compact, **personal panel**, but the design evolved to be sturdier with added **features for shared use** and long-term durability.



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PET felt and plywood for pinning up.



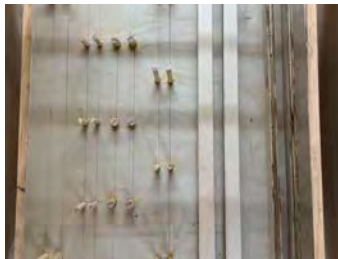
Adjustable platform designed to hold up to 50 lbs.



Integrated storage for supplies and accessories.



Built-in handle for easy transport and repositioning.



Channels for securely housing panels.

Project

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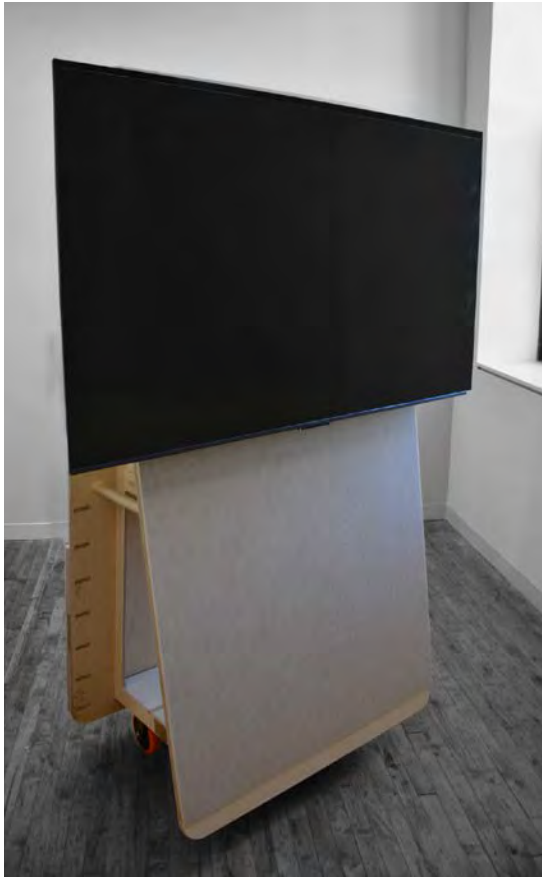
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The A-frame base can be outfitted for three core functions: a TV block for digital collaboration, a dry erase block for brainstorming and notes, and a pin-up block for showcasing posters, sketches, and reference materials.

TV Panel



Dry Erase



Pin-Up



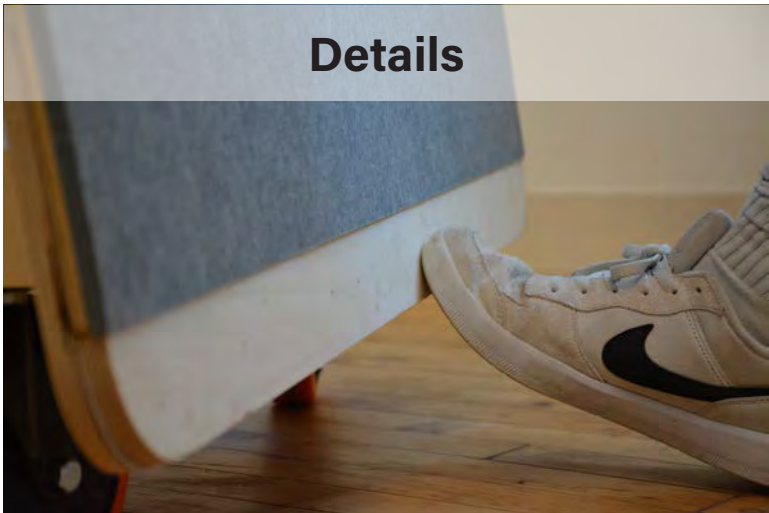


Fifteen units were fully fabricated inside the Gray Design Building by the team, showcasing a complete in-house manufacturing process. From material cutting to final assembly, every step was completed on-site, with the CNC mill taking on the heavy lifting to ensure precision and consistency across all parts.

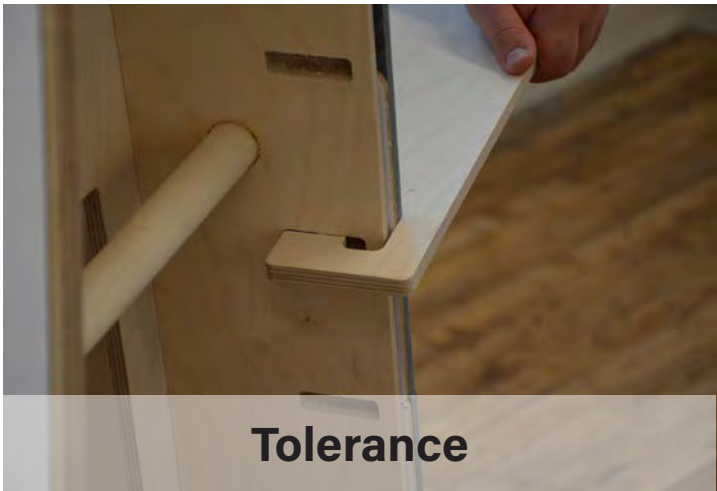




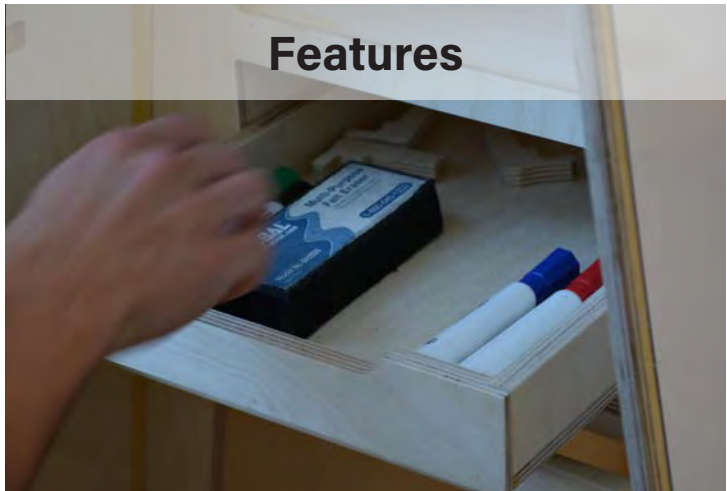
Touch Points



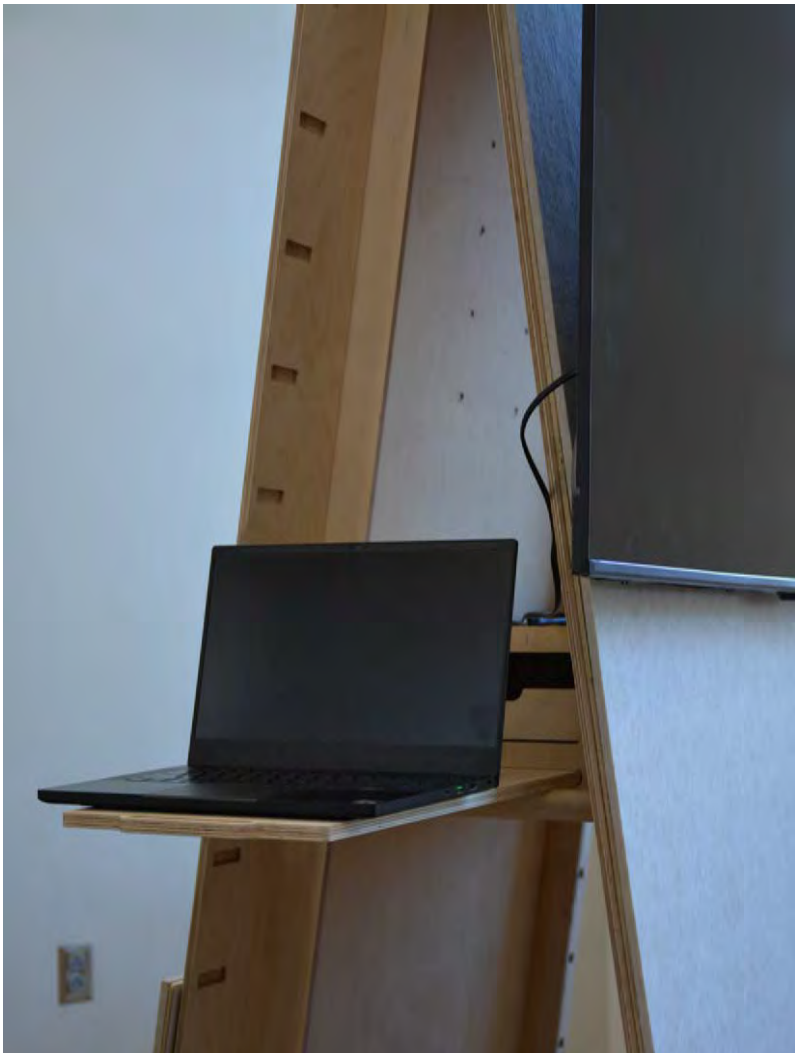
Details



Tolerance



Features



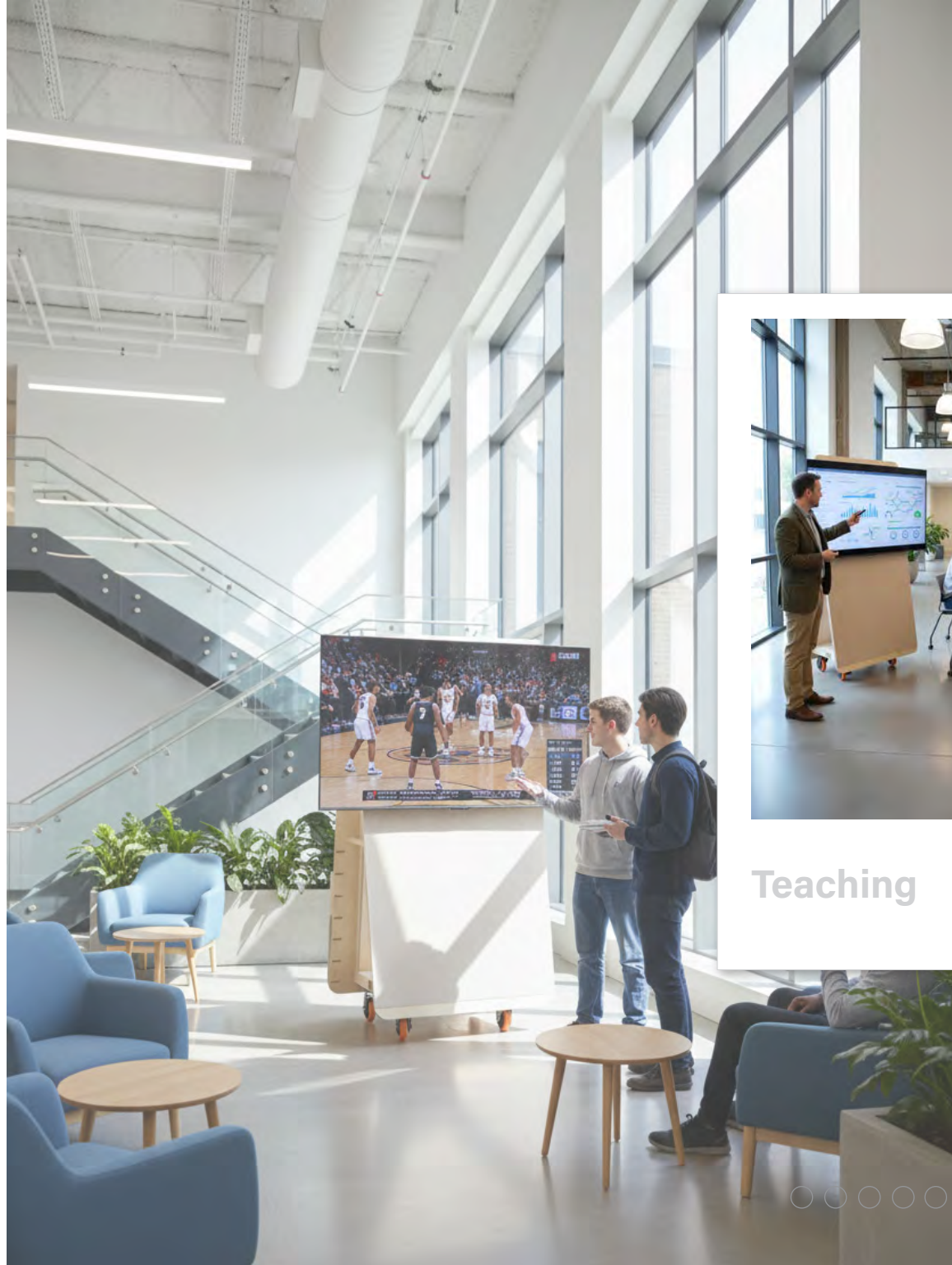
Project

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Teaching



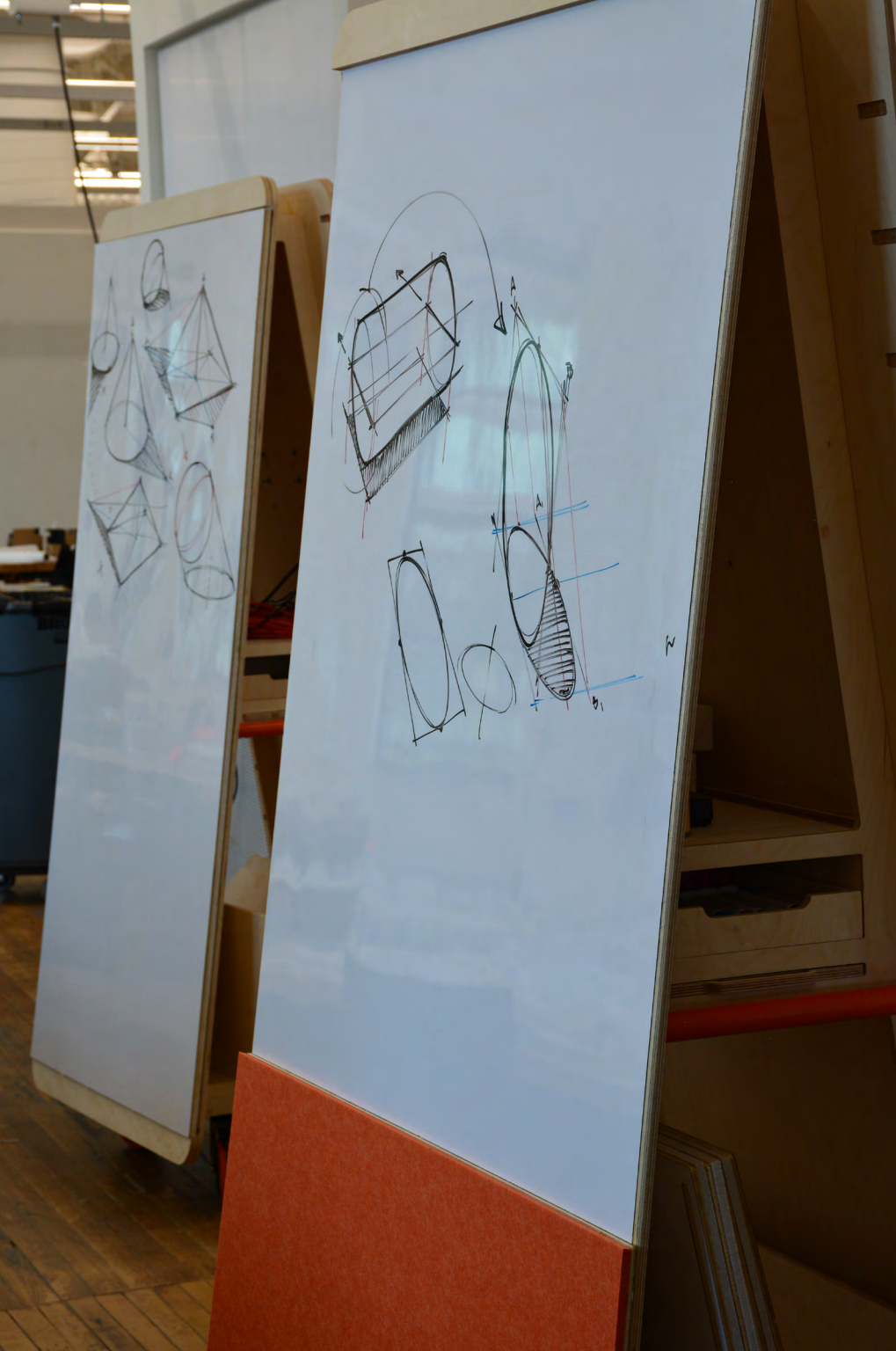
Brainstorming



Critique

All fifteen panels are currently in use throughout the **Gray Design Building**, serving a variety of purposes—from displays to collaborative work surfaces—as part of a test to evaluate their effectiveness and inform future large-scale manufacturing.





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Weather Prediction

Built using environmental sensors and onboard data processing, it showcases my skills in deep research, embedded systems, and rugged product design.



In remote environments, **weather can shift rapidly**, creating dangerous situations. Existing tools and human perception offer limited insight.

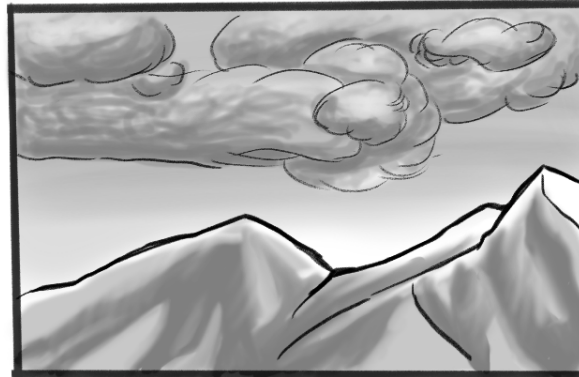
Project

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Garmin In-Reach Mini

Requires subscription to function
Relies on satellite signal
Only provides weather forecasts from local stations
Likely to be outdated or inaccurate

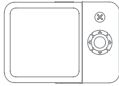


Kestrel 5400

Doesn't provide any forecasts
Only displays current conditions
Large and unwieldy



Human



Device

	Can feel ~5°F change	Measures 0.01°F
	3–5 hPa drop over multiple hours	Exact hPa in real time
	15–20% RH	Measures exact RH%
	Shifts of ~10 mph	Detects 0.5 mph
	N/A	Measures UV-A and UV-B + UV Index
	N/A	Detects strikes up to 25 mi away

The body can feel weather—but it can't measure it.
That's where Stratus in.

Project Intent

A handheld device that tracks **real-time local weather data and generates forecasting estimations** to support safe decision-making in remote environments.

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Temperature

This helps identify **unstable condition** and Influences dew point and precipitation type.



Atmospheric Pressure

Sharp pressure gradients help detect approaching **cold/warm fronts**.



Humidity

Humidity is used to calculate dew point, the temperature at which **moisture condenses**.

Weather Prediction starts with **observations of the atmosphere**



Project

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RUGGED
FORMS AND
PURPOSEFUL
DETAILING
GUIDED EARLY
CONCEPTS.

HANDHELD
GEAR INFORMED
GRIP,
BALANCE, AND
DURABILITY.

COMPACT,
WEATHER-READY
PRODUCTS
SHAPED
PORTABILITY
AND USABILITY.



Project

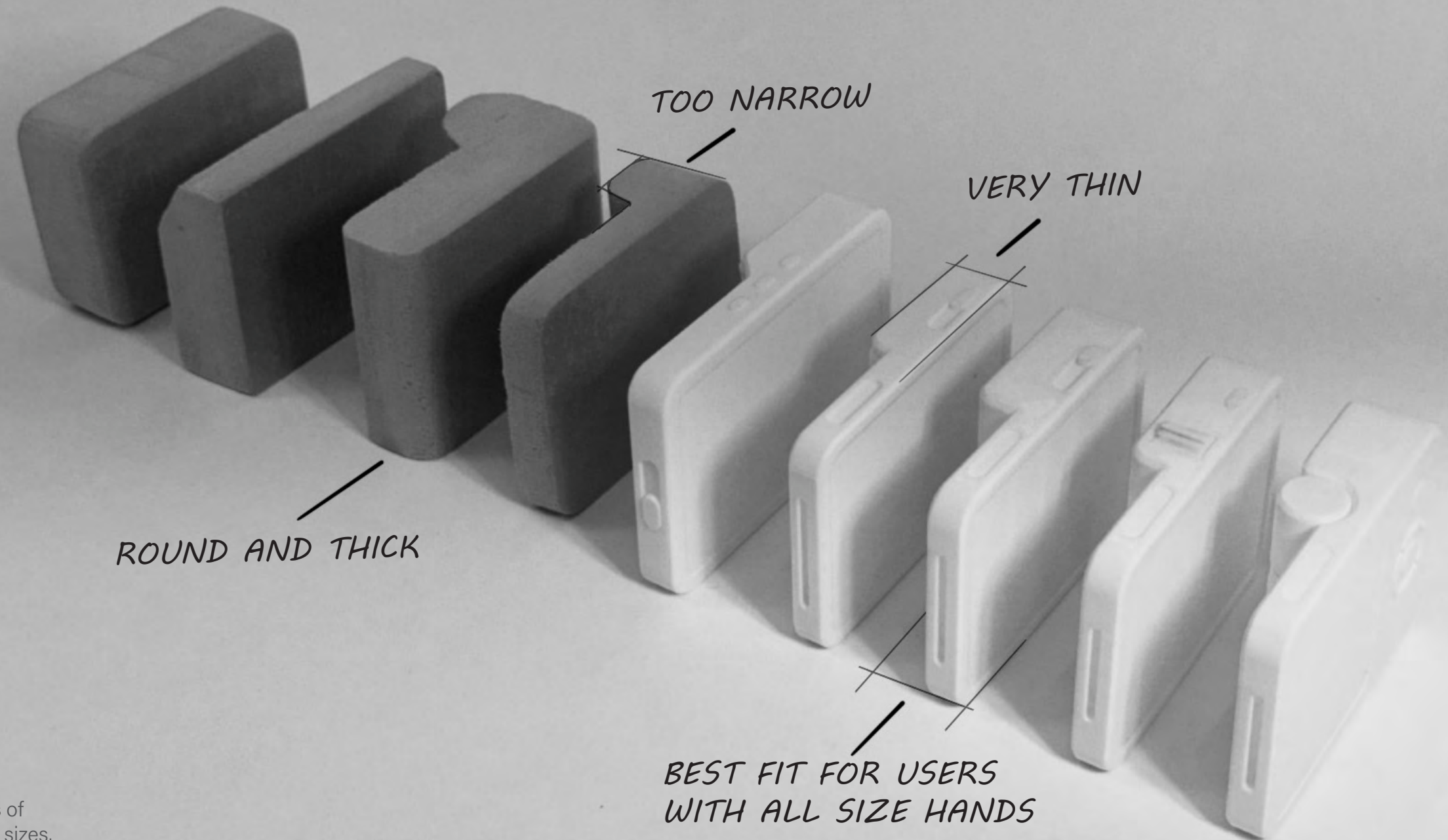
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Tested with **12 users** of
varying genders and sizes.



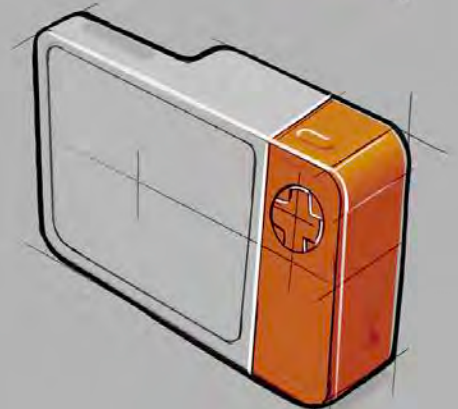
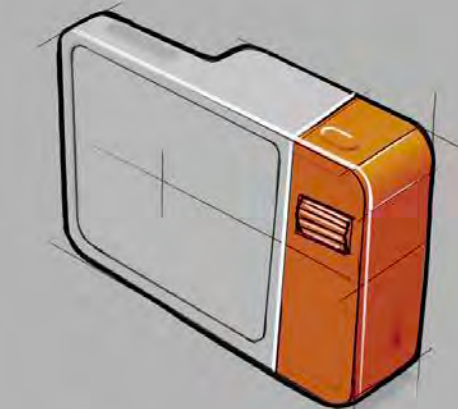
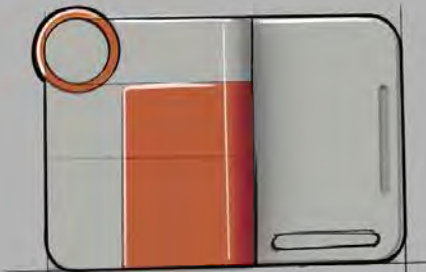
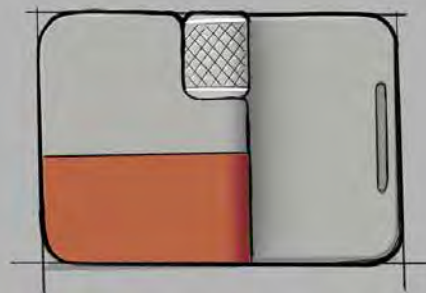
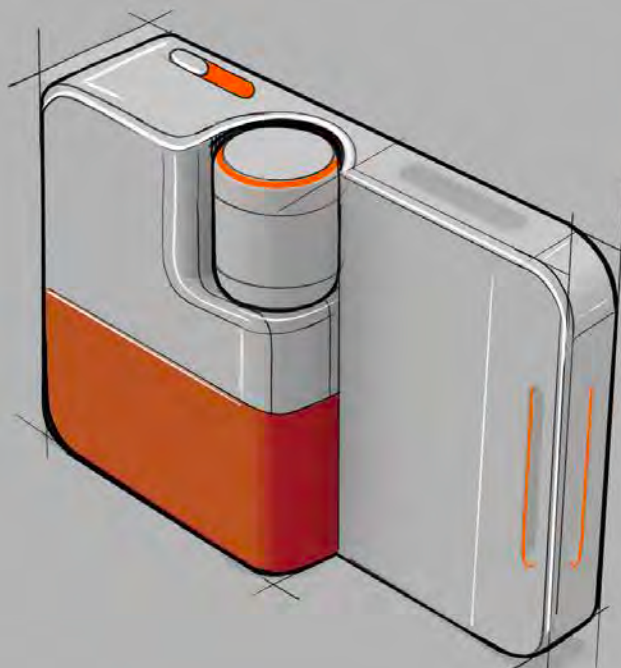
Project

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Attachment Strap



Three Stage Knob



Quick Exchange
Battery



Custom Packaging



Switching between **Off, Passive, and Active** changes the level of information the device provides, conserving battery when monitoring quietly and delivering full predictions only when you need them.



Passive



Temperature



Atmospheric
Pressure



Humidity

Active



UV



Wind



Lightning
Detection

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Ambidextrous design



Multiple Orientations





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Flicker

Portable Security Device

Flicker is a portable security device that safeguards personal belongings in shared or public spaces. Using an accelerometer, it delivers instant alerts when tampering is detected. This project highlights my skills in user interviewing, interface/experience design, and digital visualization.

4 Weeks | 1 Designer | Fall 2025



"In 2024, Americans lost nearly **\$6 billion to larceny-theft** — the most common property crime, accounting for over 70% of all cases."

- Federal Bureau of Investigation

Project

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The danger isn't force, it's how invisible it feels, leaving people uncertain and anxious about their belongings.

These images represent prominent products from each category.

Anti-Tamper Tags

Used to indicate unauthorized access.



Home Security

A wall-mounted smart doorbell with HD camera.



Tracking

Bluetooth tracker that helps locate personal items.



Security Tags

Used to prevent theft by triggering alarms if removed improperly.



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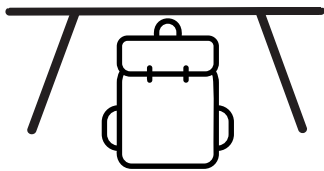
“Younger people experience **higher rates of theft** and property crime than older age groups.”

- National Crime Victimization Survey, Bureau of Justice Statistics

“**Female victims** of purse snatching were nearly twice as likely as male victims to report the theft to police.”

- National Crime Victimization Survey, Bureau of Justice Statistics





Hide

"At the lab I usually just tuck my bag under the desk and **hope for the best...**"

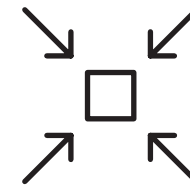
- Jocelyn
Lab Tech



Light

"I want something **light and cute**, that just stays on my purse."

- Olivia
Waiter



Small

"It needs to be **small and out of the way** I like my bag and don't want it to change"

- Emily
Nurse



Project Intent

Design an unobtrusive, **motion-sensing accessory** that protects belongings in shared and public spaces.

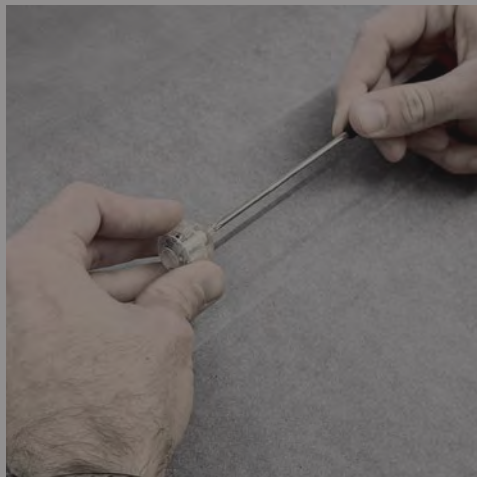
Project

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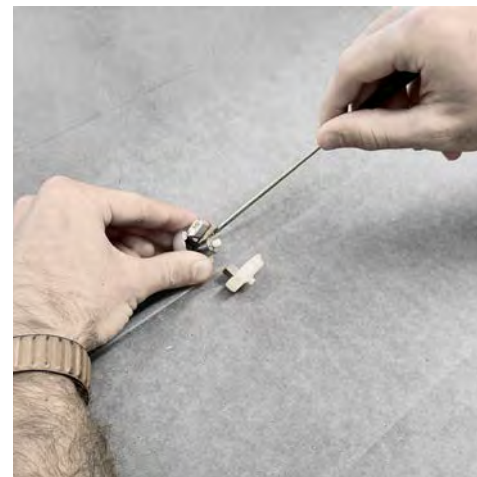
Shake Sensor

Bouncy Ball



Haptic Sensor

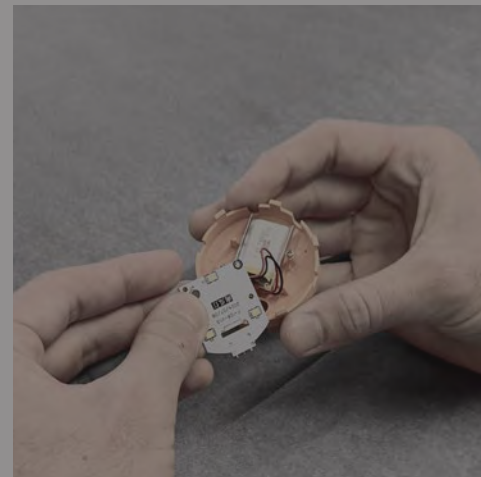
Bag Tag



Accelerometer

Detects motion
Adjustable sensitivity
Saves battery
Small & cheap

Cat Toy



Microphone

Pumpkin Decor



Design Goals Inspiration



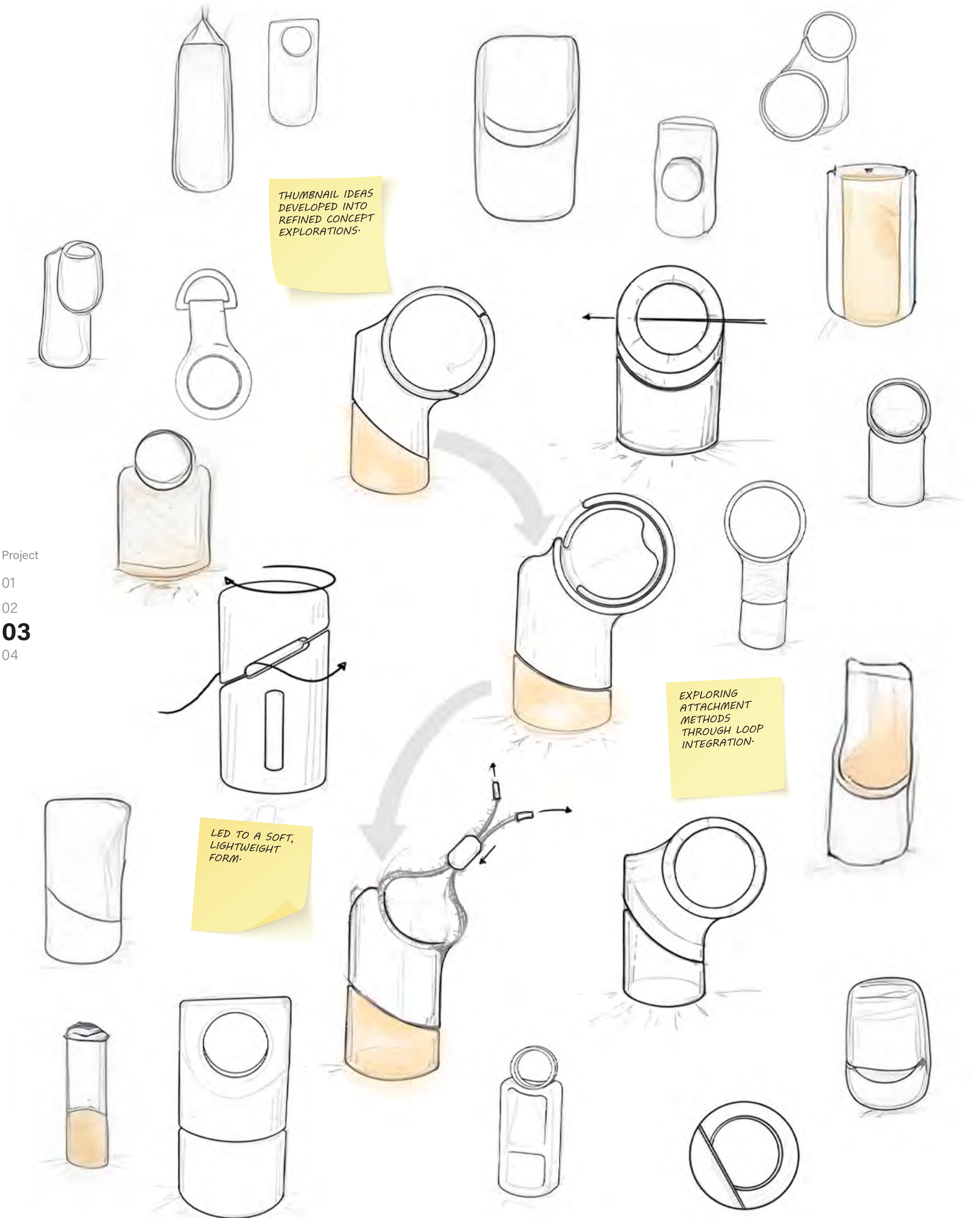
Project

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Exploration with light, color and material

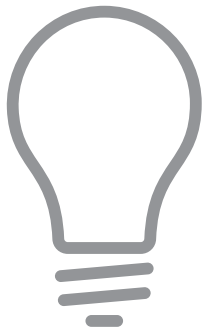
Project

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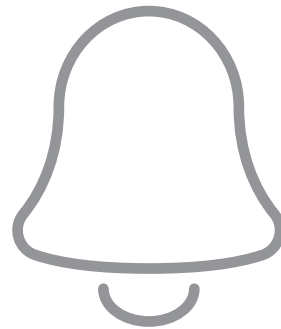
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Visual

Quick visual feedback that shows status and flashes when tampering is detected.



Audible

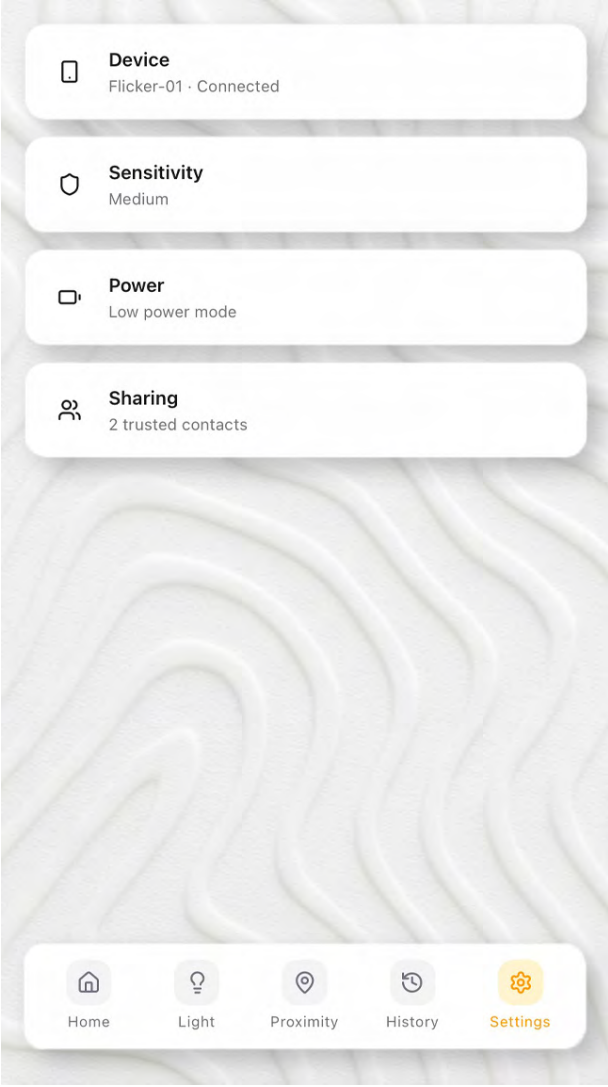
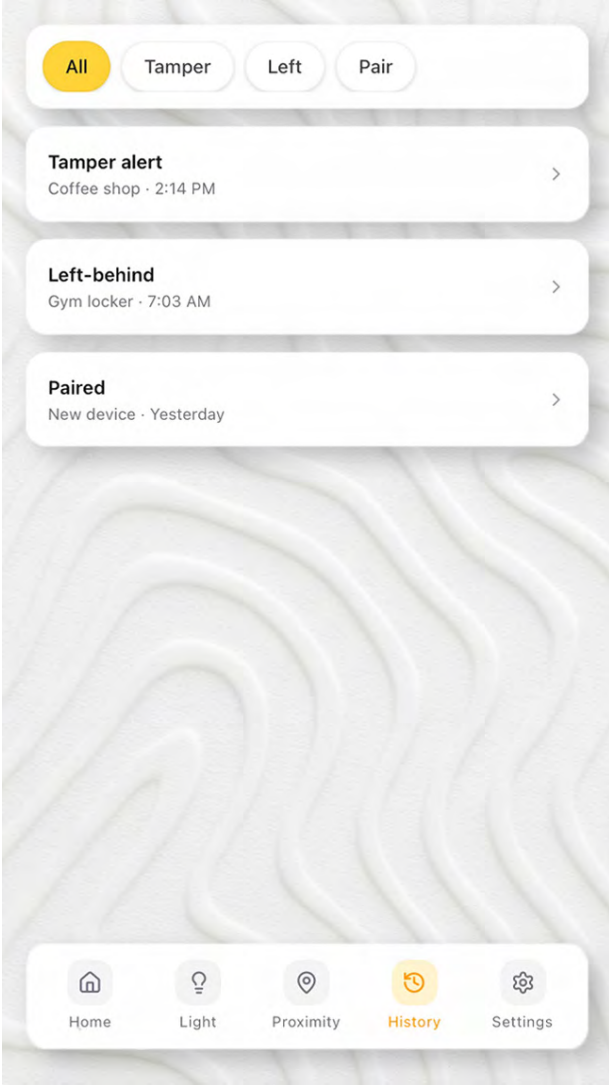
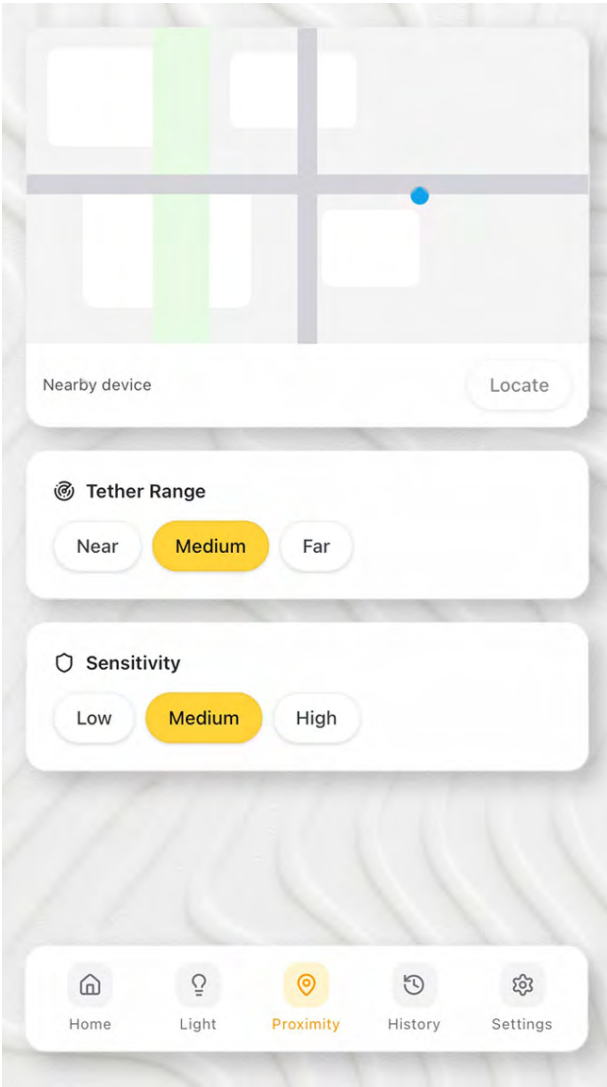
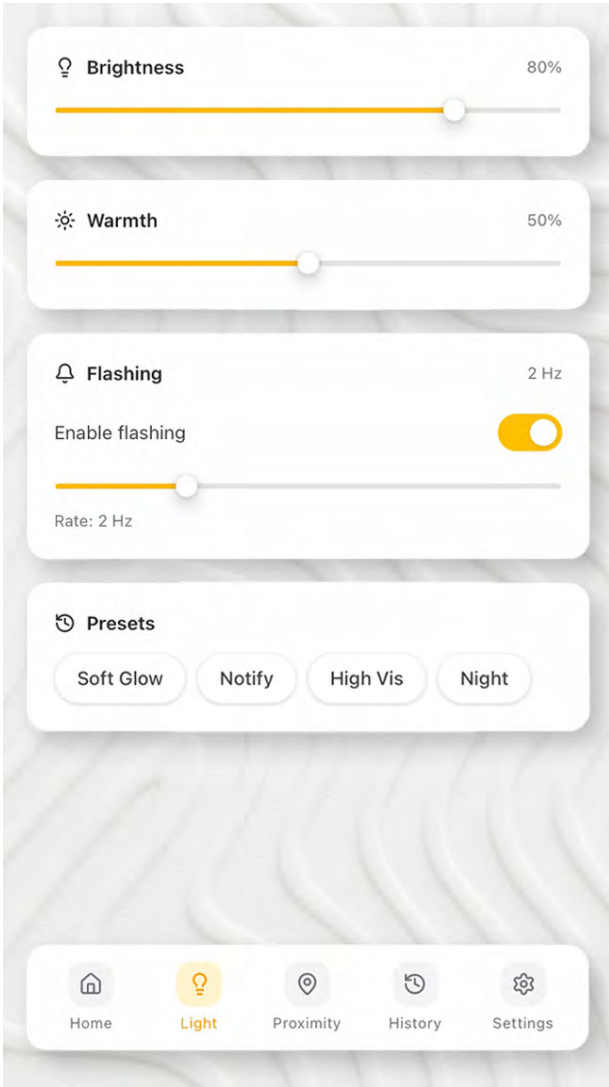
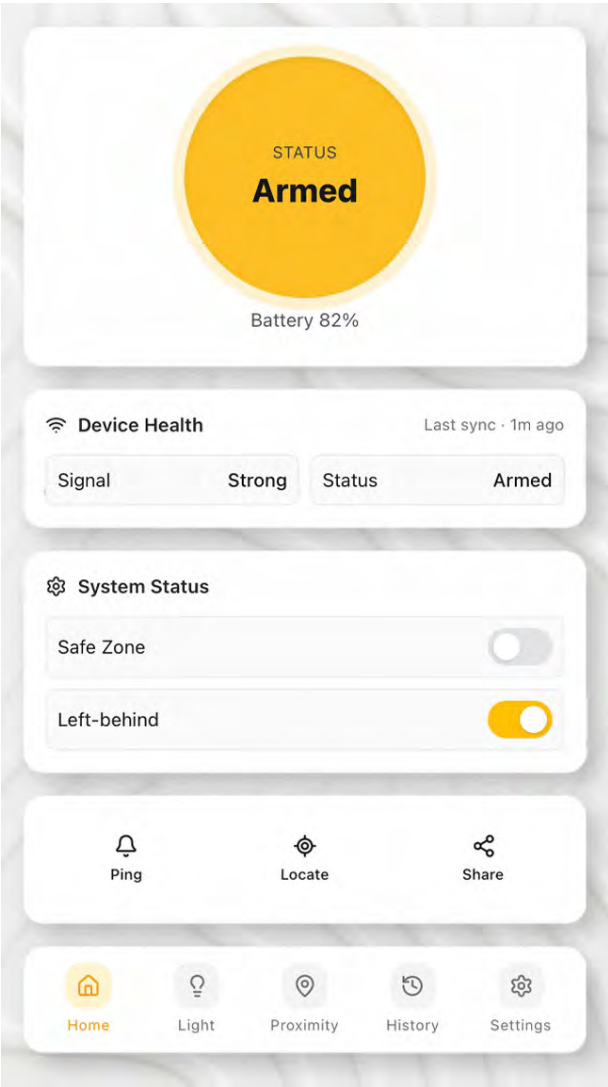
Subtle audio alert that grabs your attention without being disruptive.



Digital

Sends notifications to your phone so you stay aware anywhere.





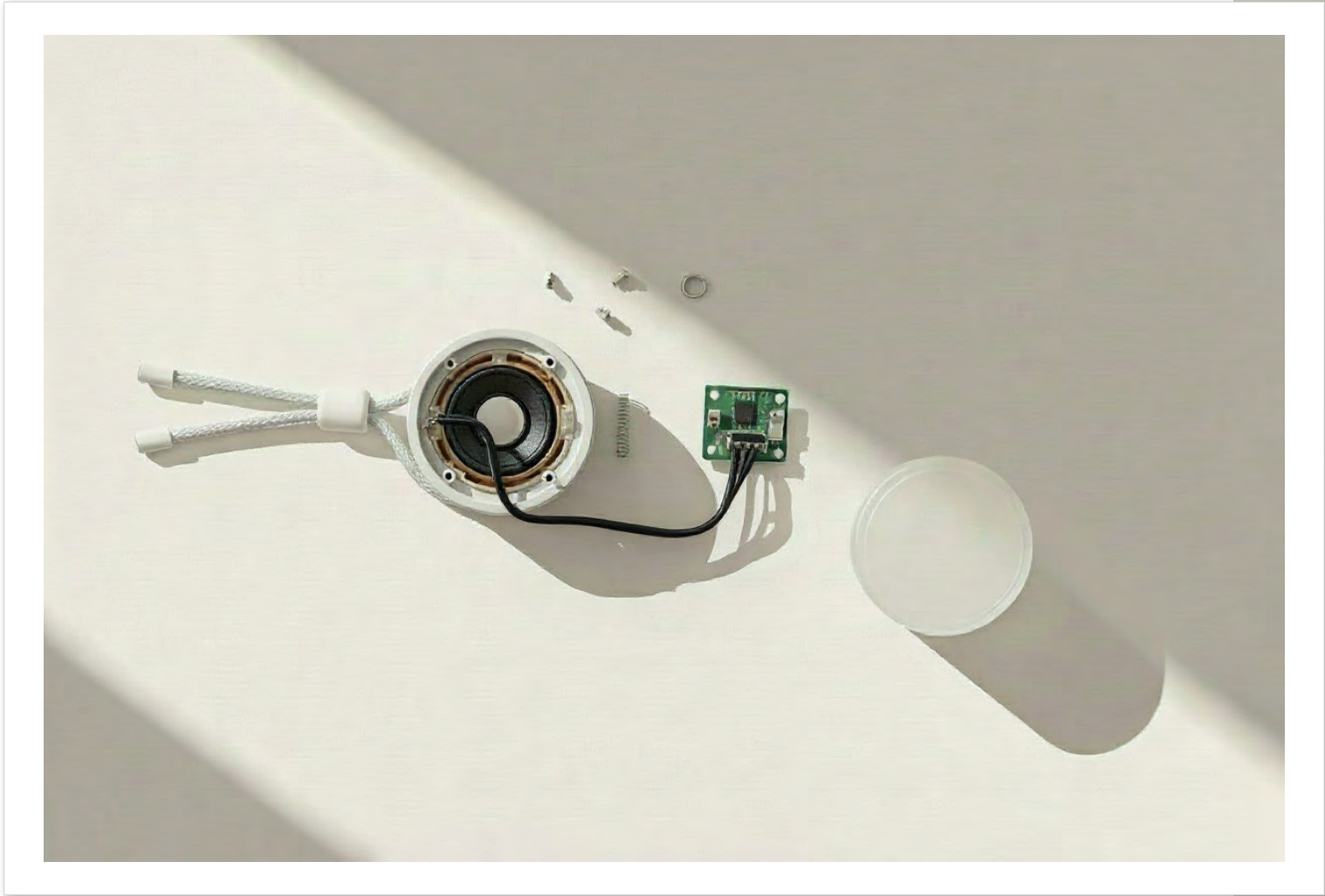
Project

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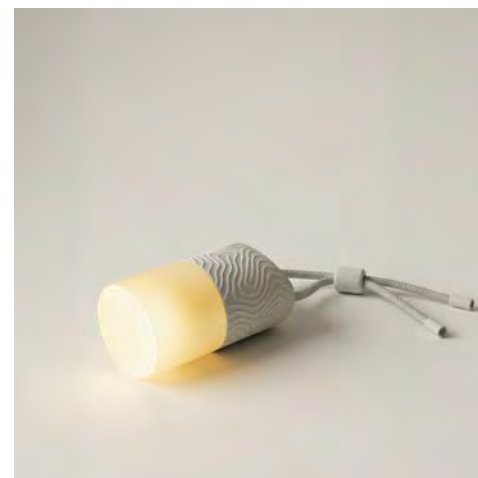
04



Top



Bottom



Side



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Somnus

Circadian Clock

Somnus is a circadian alarm clock that tracks heart beat and respiratory rate to gently wake users during light sleep. Designed to combat sleep inertia, it showcases my strengths in behavioral research, Technical Testing, and user-centered prototyping.

16 Weeks | 1 Designer | Fall 2024



"**48% of adults** in the U.S. reported not feeling well-rested when waking up in the morning."

- Center for Disease Control

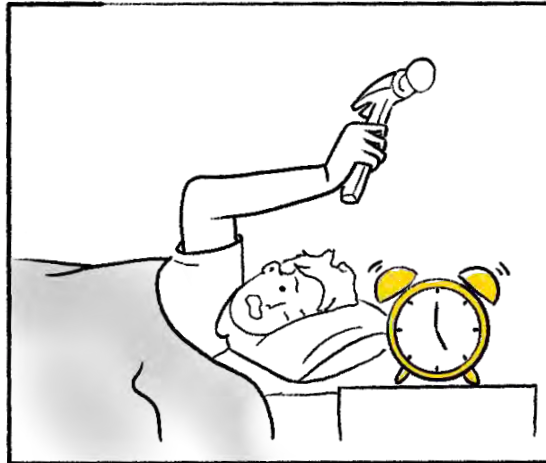
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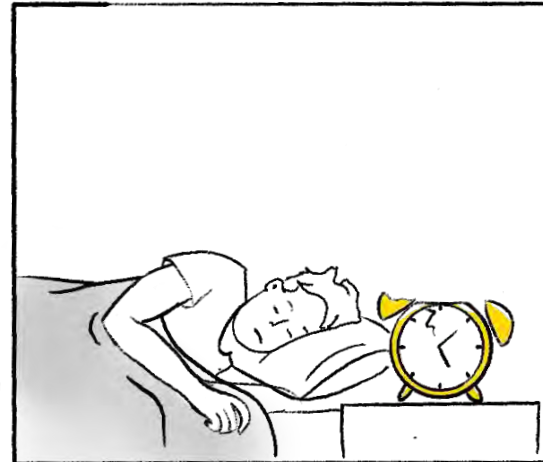
02

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Alarm wakes you from a dream,
groggy and confused



After hitting snooze you fall
back asleep



Now you wake up tired and
angry because you are late



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Interrupting REM

Waking during deep sleep or REM can cause **sleep inertia— grogginess and poor performance.** Many struggle to align wake-up times with light sleep, especially with irregular schedules.

Effects

Prolonged sleep inertia is linked to mood disorders like anxiety and depression. Long-term sleep loss impairs emotional regulation, increases stress, and reduces the brain's ability to process emotions. Other risks include cardiovascular issues, metabolic disorders, and weakened immunity.

Target

Contact-induced insomnia is sleep disruption caused by physical or sensory stimuli from another person or source, such as touch, movement, or noise.



Research Insight

An **inconsistent schedule paired with Contact-induced insomnia** leaves users vulnerable to effects of sleep inertia.



Sleep Product Market Growth

The sleep market has grown \$65 Billion (WW) in the last 3 years with an average CAGR(Compound annual growth rate) of 6.3% the revenue forecast for 2030 is \$900 Billion.

The fastest growing sector of sleep related market is **sleep based products**, predicted to take 35% of the market by 2025.

Invasive Tech

Current tech- using sensors for biometrics.
Must wear device.

Accuracy: good



Phone Apps

Phone app- uses micro phones to track movement. Needs a still quiet environment. Limited range, phone must be next to bed.

Accuracy: medium



Physical Reset

The physical method- set alarm before desired wake up time to reset sleep cycle. Diminishes quality of sleep. Still causes long term health issues.

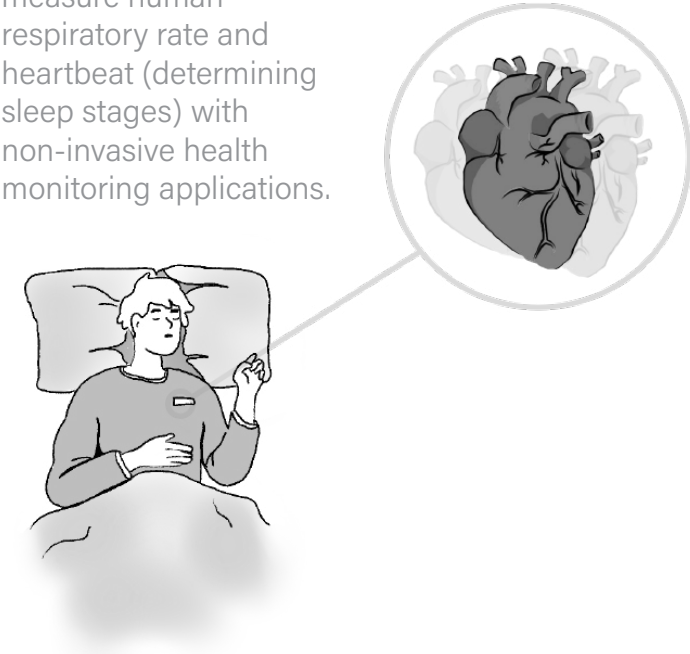
Accuracy: poor



Project Intent

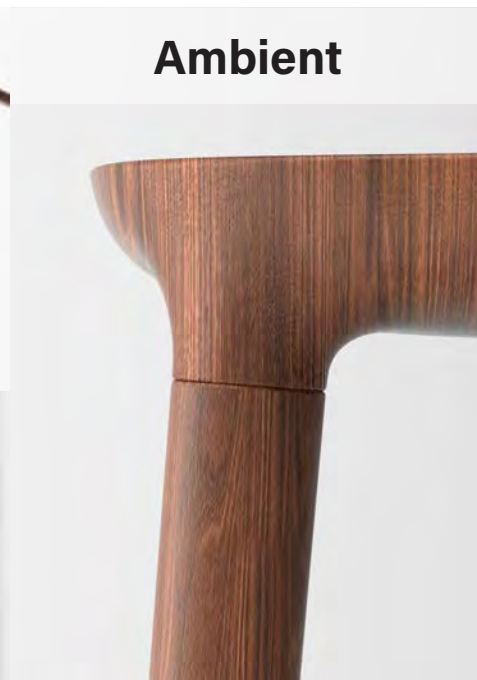
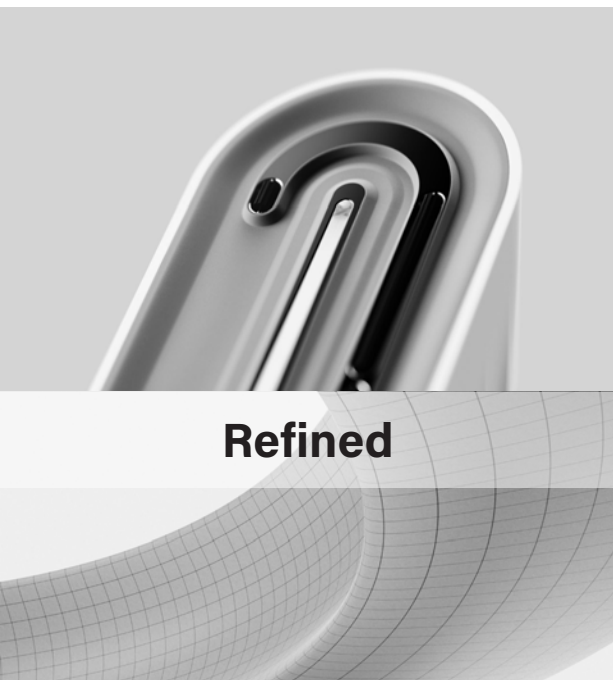
Create a **sleep-tracking alarm** that reduces sleep inertia for people with contact-induced insomnia.

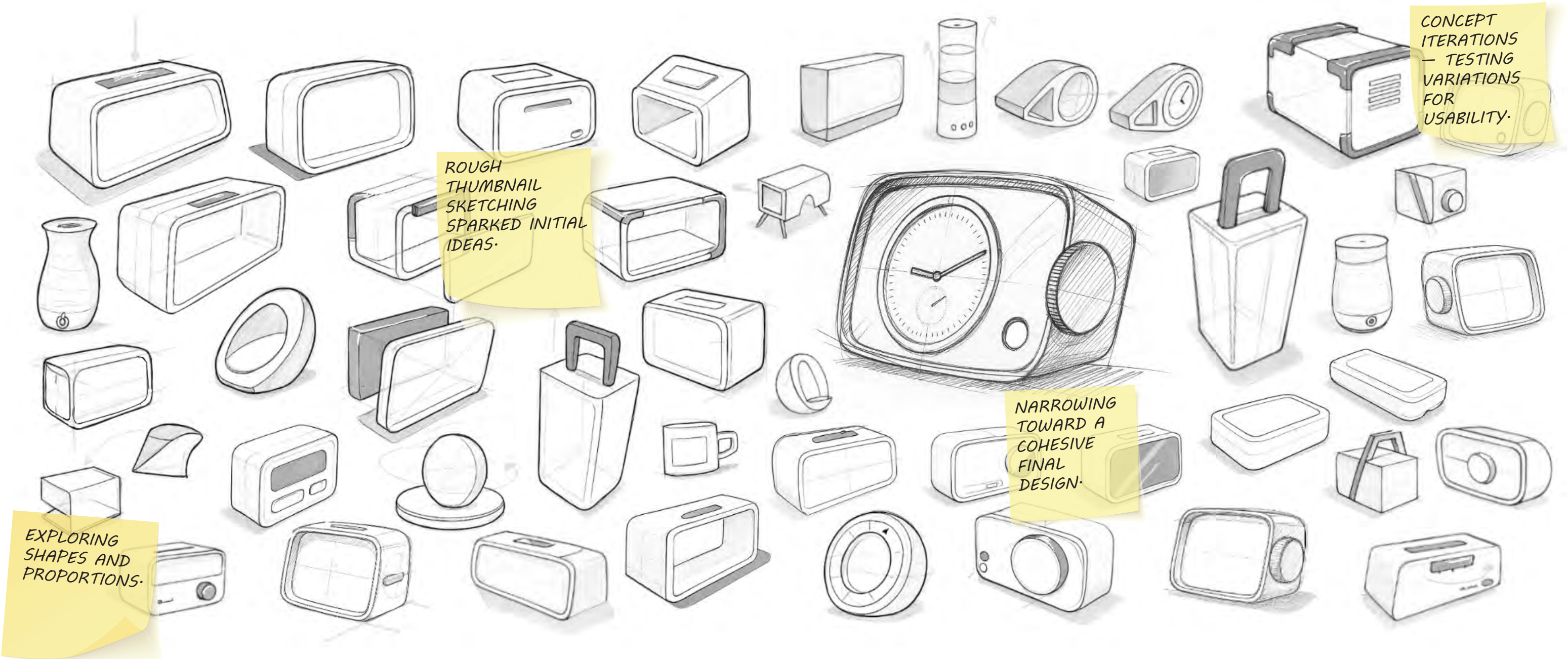
How to reliably measure human respiratory rate and heartbeat (determining sleep stages) with non-invasive health monitoring applications.



To track sleep without physical contact, I ran small-scale tests using a radar sensor capable of detecting movements. While prior MIT research had already proven the technology's feasibility, my testing focused on scale and range, helping me understand how **sensor distance and placement would shape the size and form.**

Design Goals Inspiration





EXPLORING
SHAPES AND
PROPORTIONS.

ROUGH
THUMBNAIL
SKETCHING
SPARKED INITIAL
IDEAS.

NARROWING
TOWARD A
COHESIVE
FINAL
DESIGN.

CONCEPT
ITERATIONS
- TESTING
VARIATIONS
FOR
USABILITY.

Project

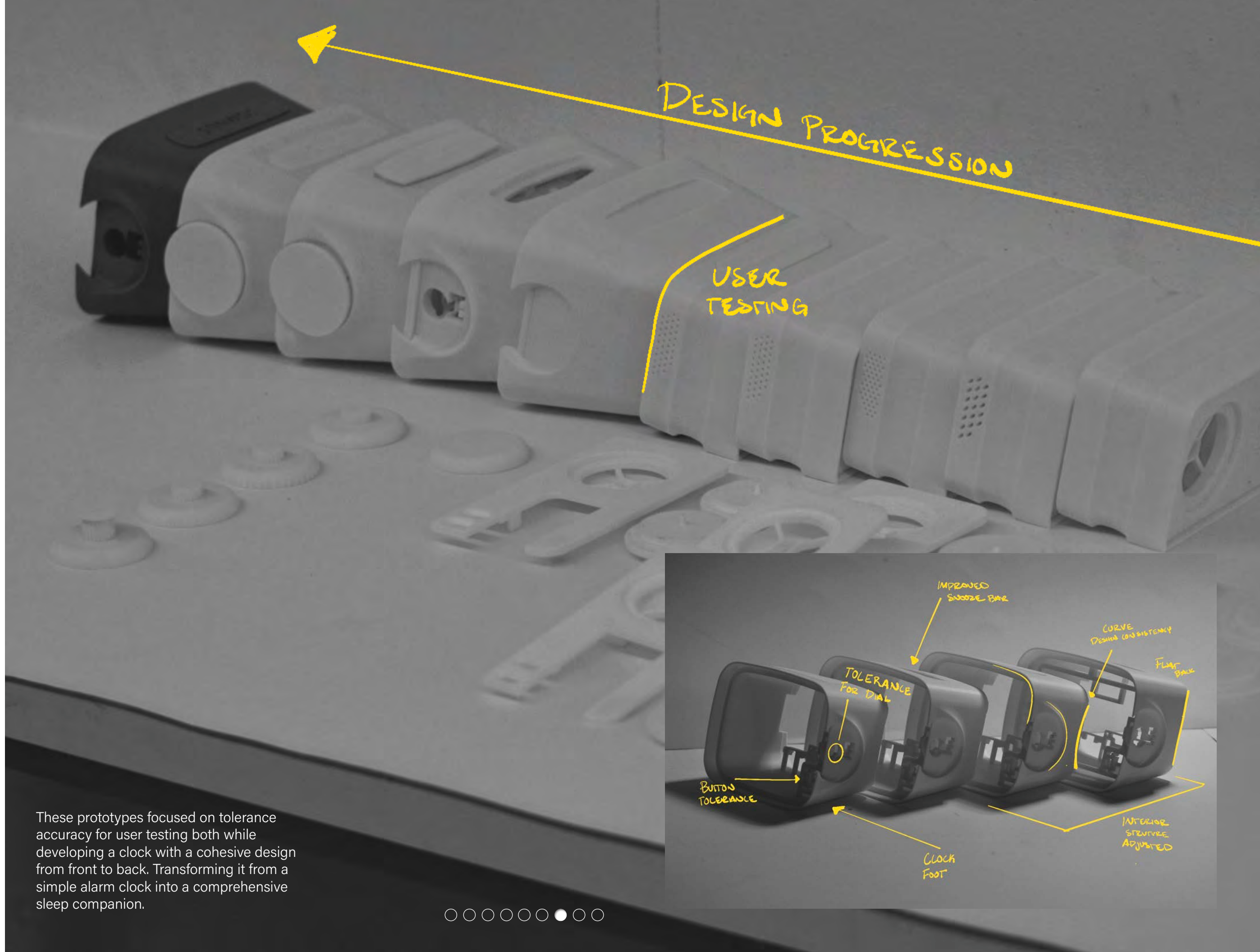
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These prototypes focused on tolerance accuracy for user testing both while developing a clock with a cohesive design from front to back. Transforming it from a simple alarm clock into a comprehensive sleep companion.



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All touchpoints are crafted from **metal to emphasize precision and permanence**, reinforcing the sense of a carefully made, premium object. Each interaction was intentionally designed to deliver clear tactile feedback, so users not only see the design's quality but also feel it with every use.





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Additions

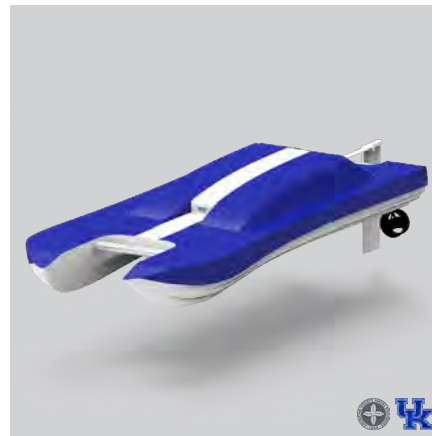
Hardware Crypto Wallet

Explored visual communication, AI-assisted sketch tools, and scenario-driven design through a speculative crypto wallet concept addressing future security needs.



RC Competition Boat

Led structural design and CNC fabrication of a catamaran hull for the ASNE PEP competition; collaborated with engineers on systems integration.



Bullard PAPR

Gained experience in user research, ergonomics, and prototyping through a professional collaboration with Bullard on a Powered Air-Purifying Respirator.



ANC Blender

Strengthened prototyping, user-focused design, and acoustic design skills through an Active Noise Cancelling blender concept.



Thank You

Reach Out

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