

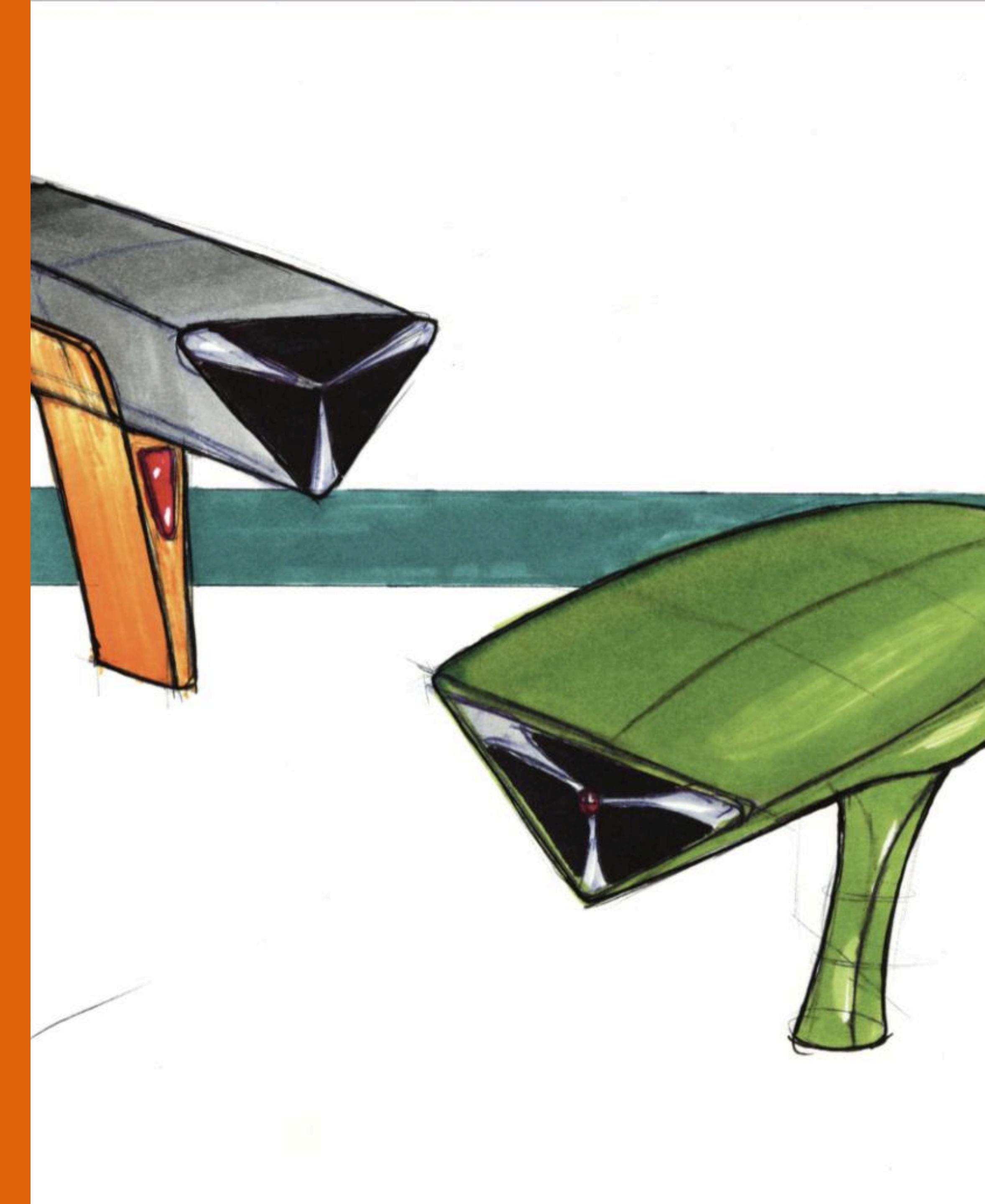
# PORTFOLIO

Bryan Nguyen-Son

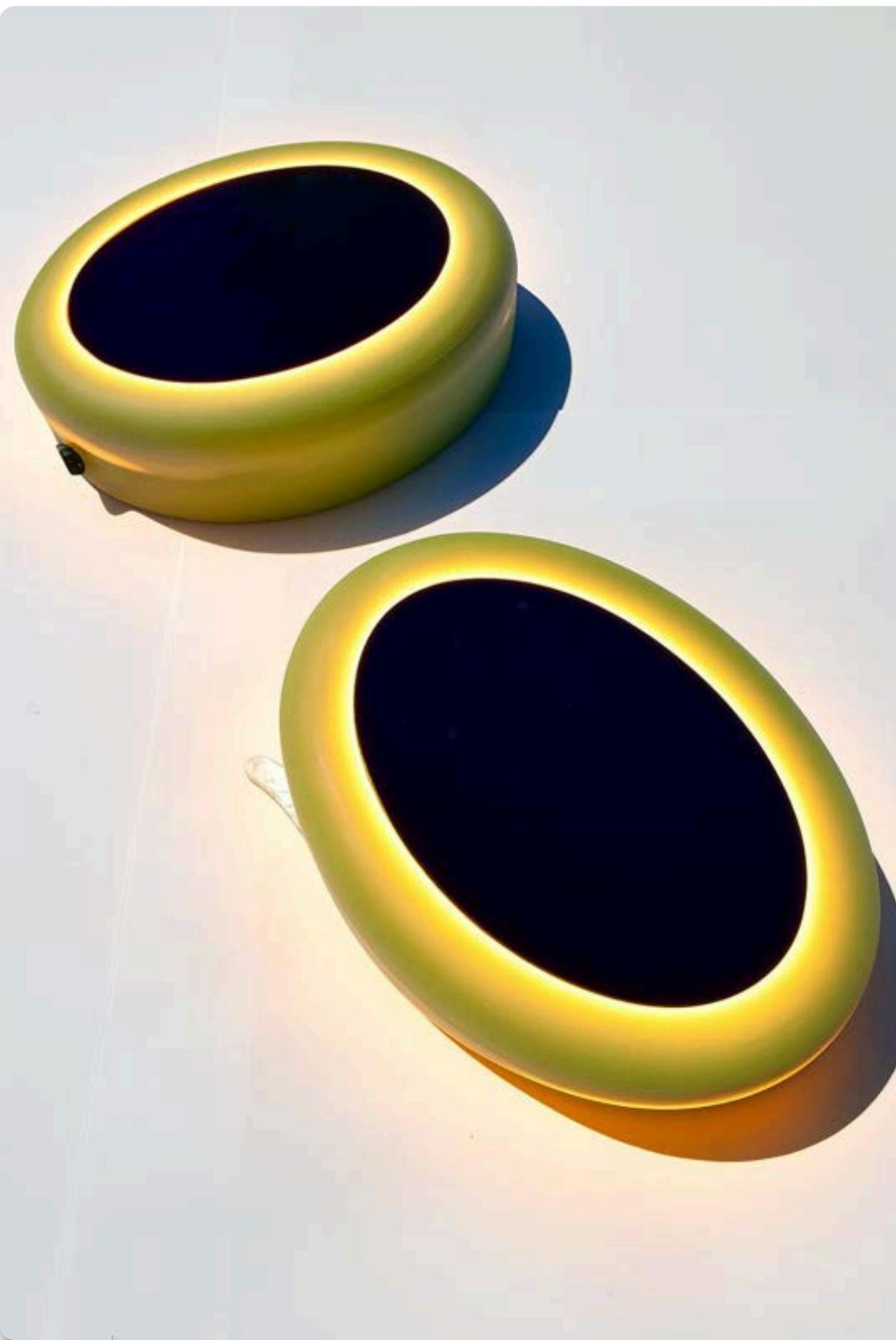
BRYAN NGUYEN-SON

| PORTFOLIO

| PROJECTS



# Projects



# Project 1

## Industrial & Interaction designer

This project explores how domestic AI-powered robots can earn user trust by balancing autonomy, predictability, and privacy through transparent interaction design

**Collaboration:** Solo work

**Durations:** 6 months

**Methods:** interviews / usability test / expert feedback / prototyping

**Deliverables:** physical prototype / App

# Apple Assist Pro



# User Experience problem

## Noise

Many users report that current robot vacuums are loud and disruptive, making it hard to work, relax, or hold conversations at home.



## Detection

Users often complain that vacuums miss small hazards like nails, cables, or pet waste, leading to extra cleanup and potential damage.



## Technology

Users feel current robot vacuums are too limited and want them to do more than just clean like having additional useful features beyond simple vacuuming.



## **Vacuum: Secure - Assist - Entertained**

A home device designed for quiet, predictable behavior. It cleans, monitors, and plays audio unobtrusively with AI-driven, reliable interactions.





Smart vacuum with AI-powered navigation, real-time obstacle scanning, high-volume speaker for alerts, and app-based control.



Control, schedule, and monitor your AI vacuum effortlessly. Smart cleaning, security, and automation all in with built-in touch screen or in app.

# Persona



**Dennis Jordan**  
63, Retiree  
Portland, Oregon

**Bio**  
Dennis Jordan was born in South Carolina and graduated from college with a degree in History. She later moved to the West Coast to raise a family. With a deep passion for hiking and nature-filled adventures, Dennis enjoys exploring the outdoors and tackling hardcore hikes every week as a leader of a hiking group. She also has a big heart for animals, and her loyal dog, always by her side, is her closest companion. Beyond her love for nature, Dennis cares deeply about her community and neighborhood, always looking for ways to give back and make a positive impact.

**Goals & Interests**

- Stay Active: Passionate about hiking and exploring nature, always looking for the next adventure.
- Community Connection: Loves giving back and staying involved in the neighborhood.
- Animal Lover: Big heart for animals, with her dog as her closest companion.
- Relax & Recharge: Enjoys quiet moments at local cafes and listening to music at home.

**Motivations**

Motivation	Score
Developer experience	90%
Personal growth	90%
Industry knowledge	10%
Learning skills	50%
Time ROI	10%

**Software**



**Personality**

Personality Type	Score
Extrovert	5
Analytical	5
Sensing	5
Judging	5

**Brands**



NATURE PET COMMUNITY

**Pain Points & Concerns**

- Time Management: Struggles to find enough time for cleaning and maintaining the house.
- Pet Care: Cares deeply for her dog and is concerned about maintaining a clean environment, especially with other robots passing over dog waste.
- Neighborhood Safety: Worried about crime in the neighborhood and seeking better ways to ensure the security of her home and family.
- Stress Relief: Feels stressed from daily pressures and wishes for more time to relax and recharge at home.



**Andy Chang**  
26, Software engineer  
San Francisco, California

**Bio**  
Andy Chang is a 26-year-old software engineer from Southern California, a UC Berkeley graduate with a degree in Computer Science. He works at a top tech company, focusing on developing innovative digital solutions and exploring the latest tech products. Andy has a deep interest in how technology can improve everyday life and loves staying on the cutting edge of new technology. His hobby included visiting Art museum and relaxing cafes in San Francisco.

**Goals & Interests**

- Improve Health: Focused on staying healthy and using tech to support fitness and well-being.
- Make Life Easier: Looks for products that save time and help create a more efficient, stress-free lifestyle.
- Love traveling on weekends
- Wanted to listen more to music while working at home

**Motivations**

Motivation	Score
Developer experience	90%
Personal growth	80%
Industry knowledge	50%
Learning skills	80%
Time ROI	10%

**Pain Points & Concerns**

- Not having enough time to clean his house
- Work-Life Balance: Finds it hard to separate work and personal life, especially when working from home.
- Pet Health: Concerned about tracking his cat's health and well-being effectively.
- Stress: Often feels stressed from work and daily life pressures and wanting more time to relax at home

**Software**



**Personality**

Personality Type	Score
Extrovert	5
Analytical	5
Sensing	5
Judging	5

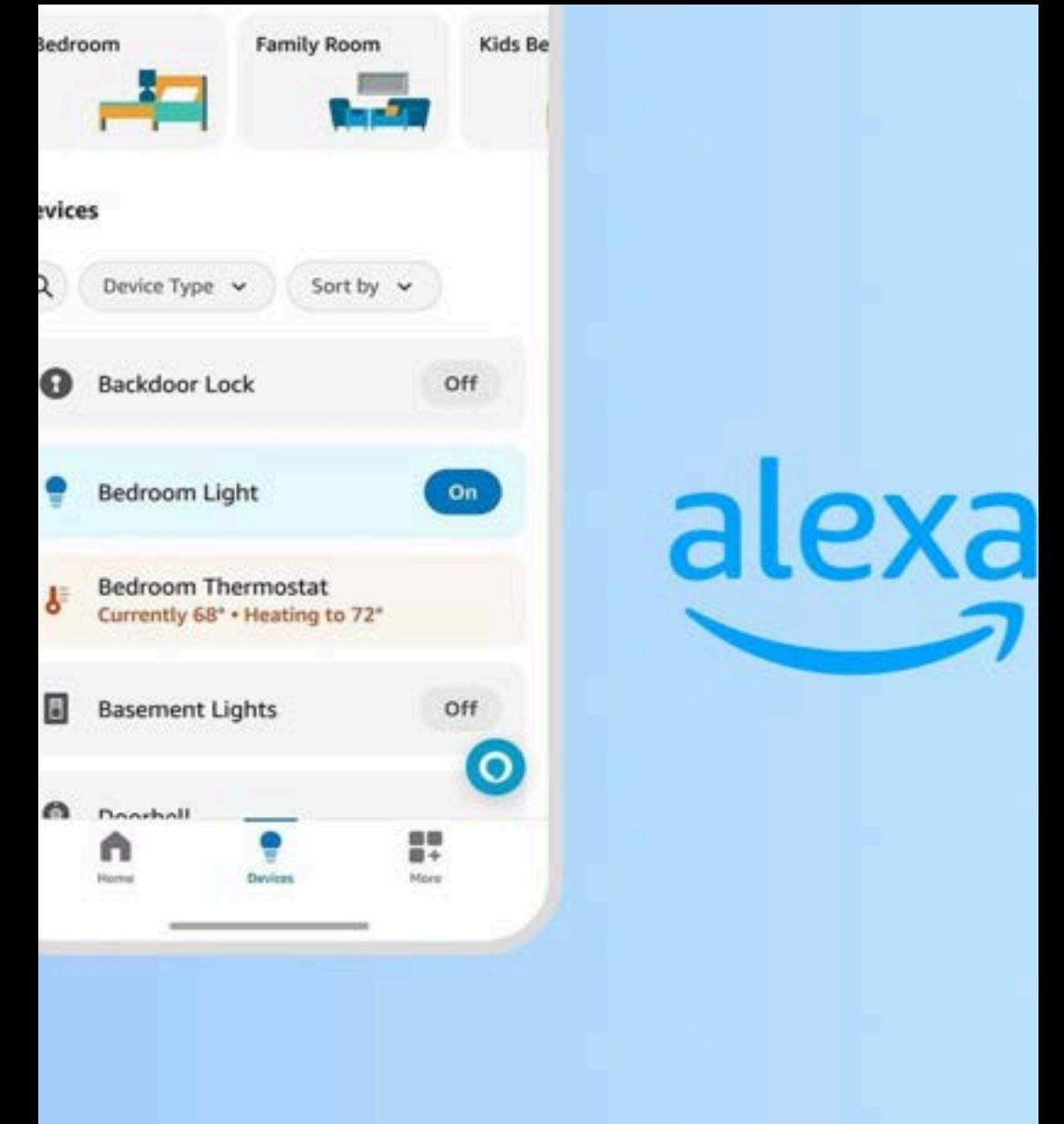
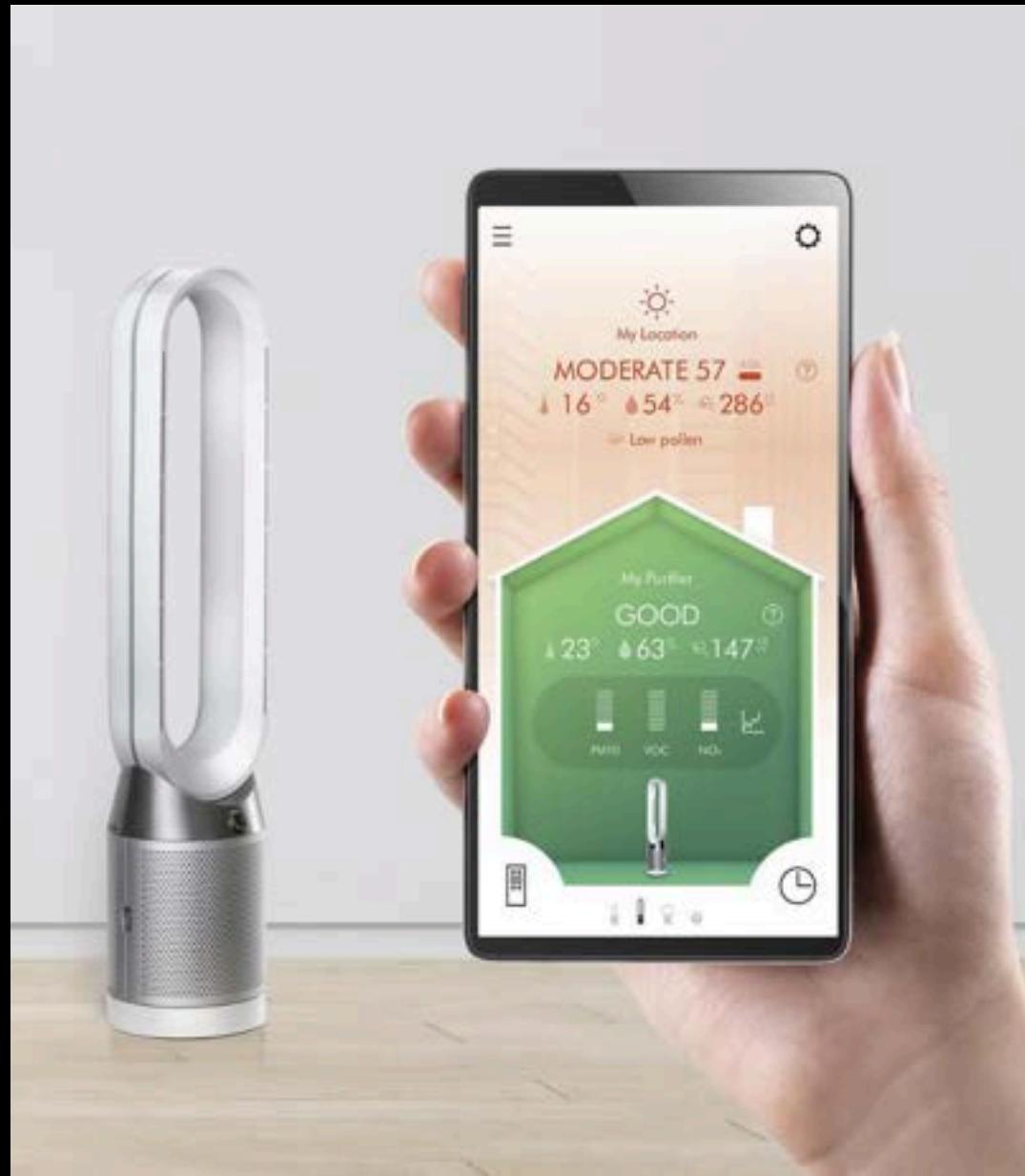
**Brands**



TECHNOLOGY ART PHOTOGRAPHY

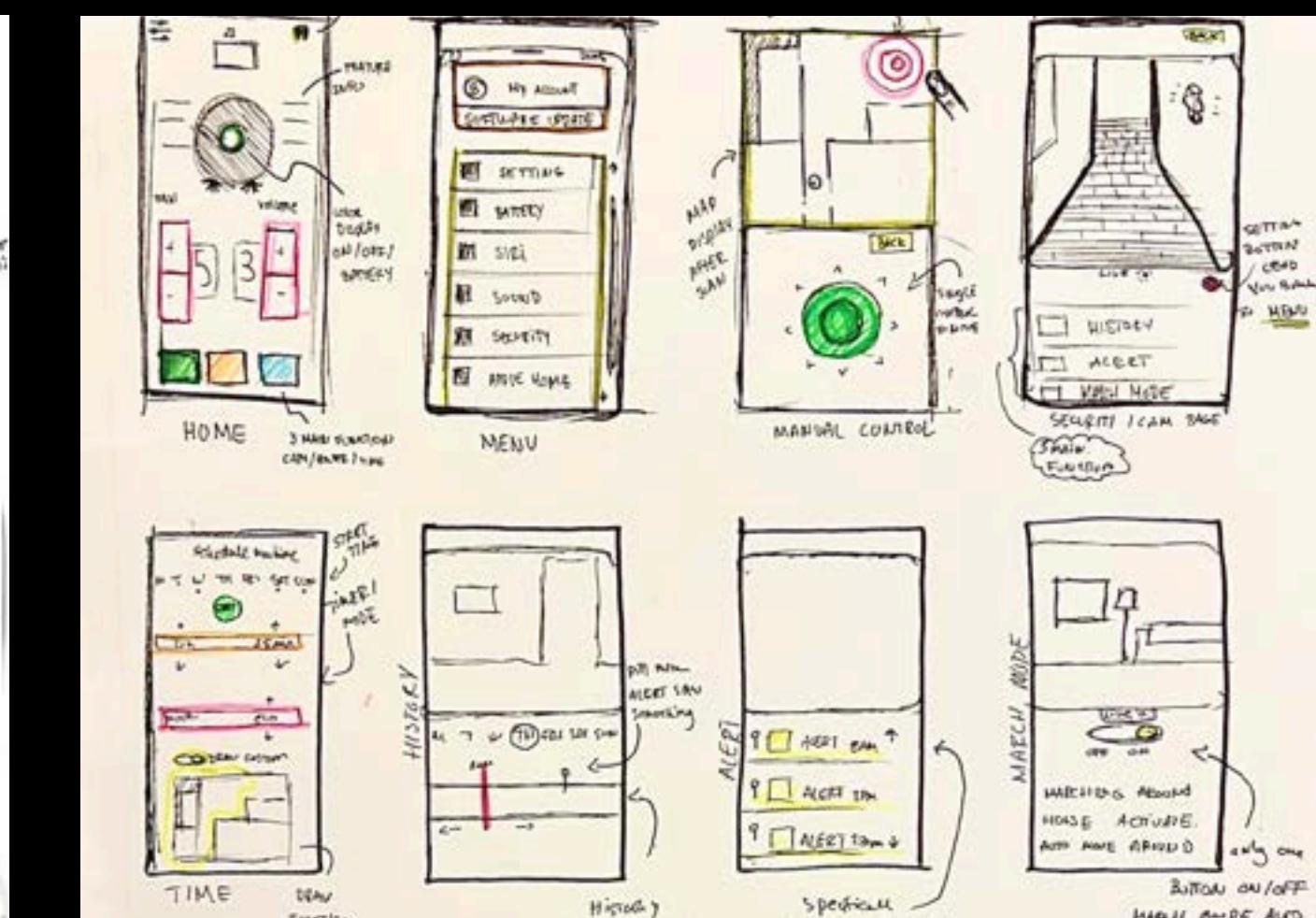
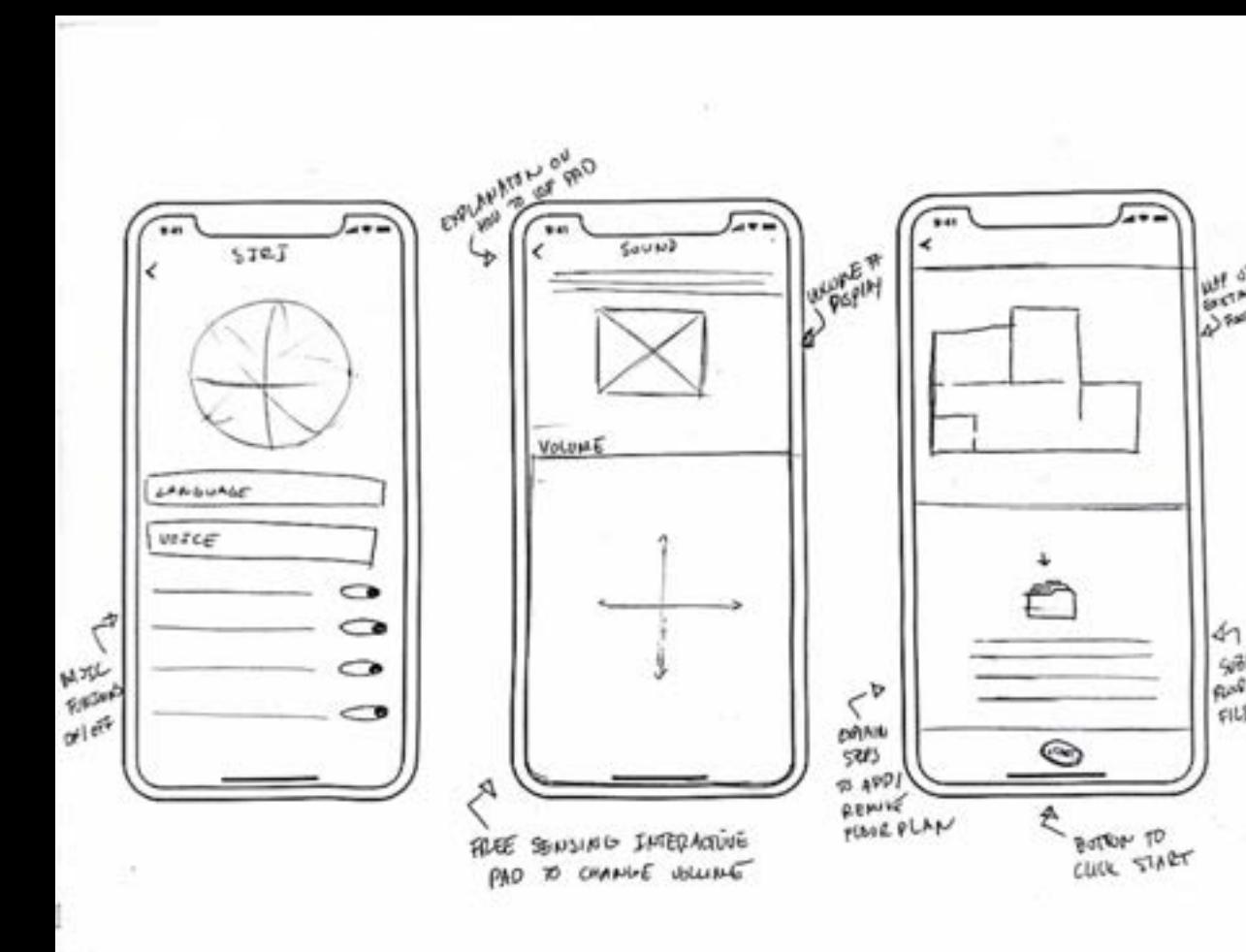
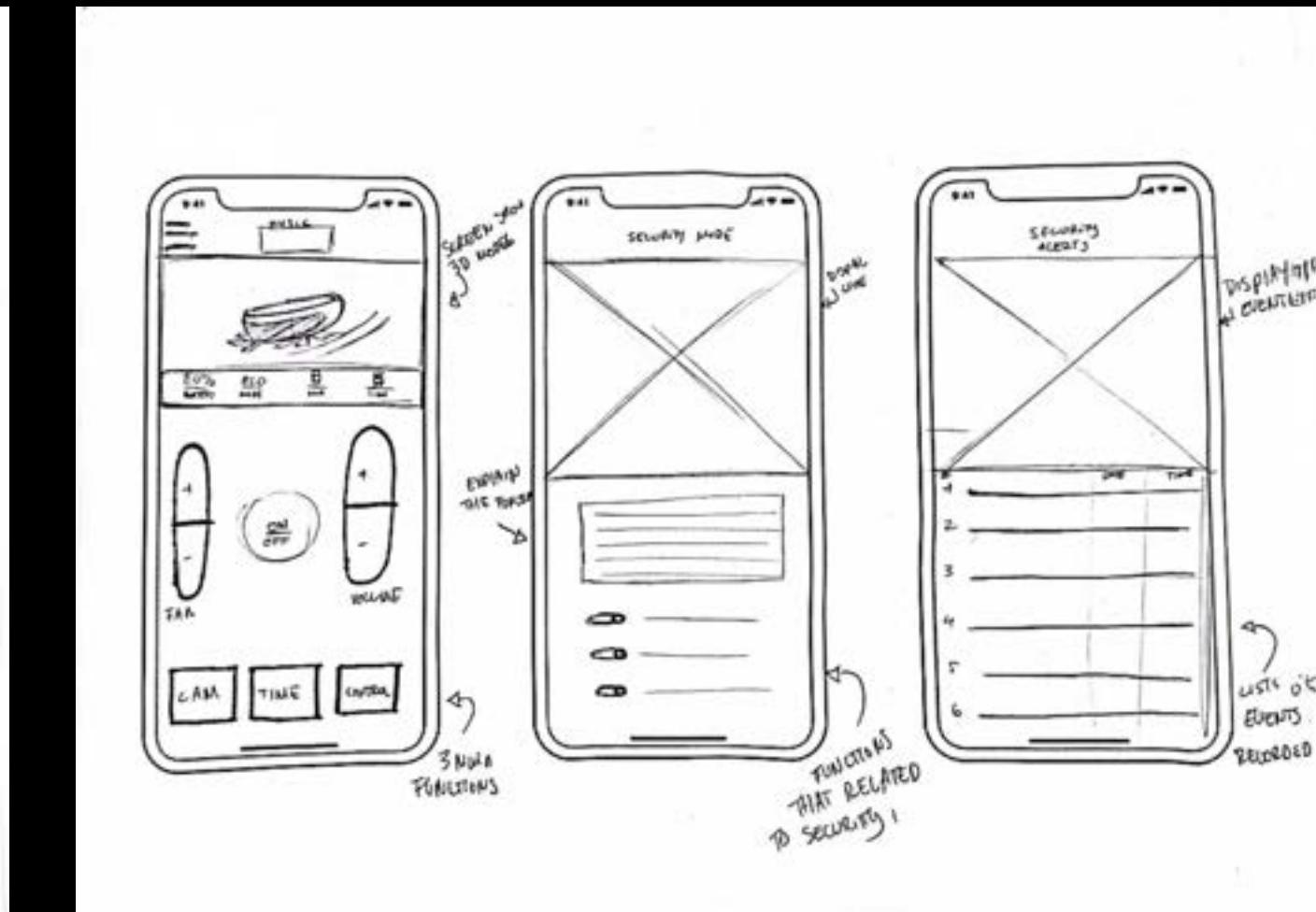
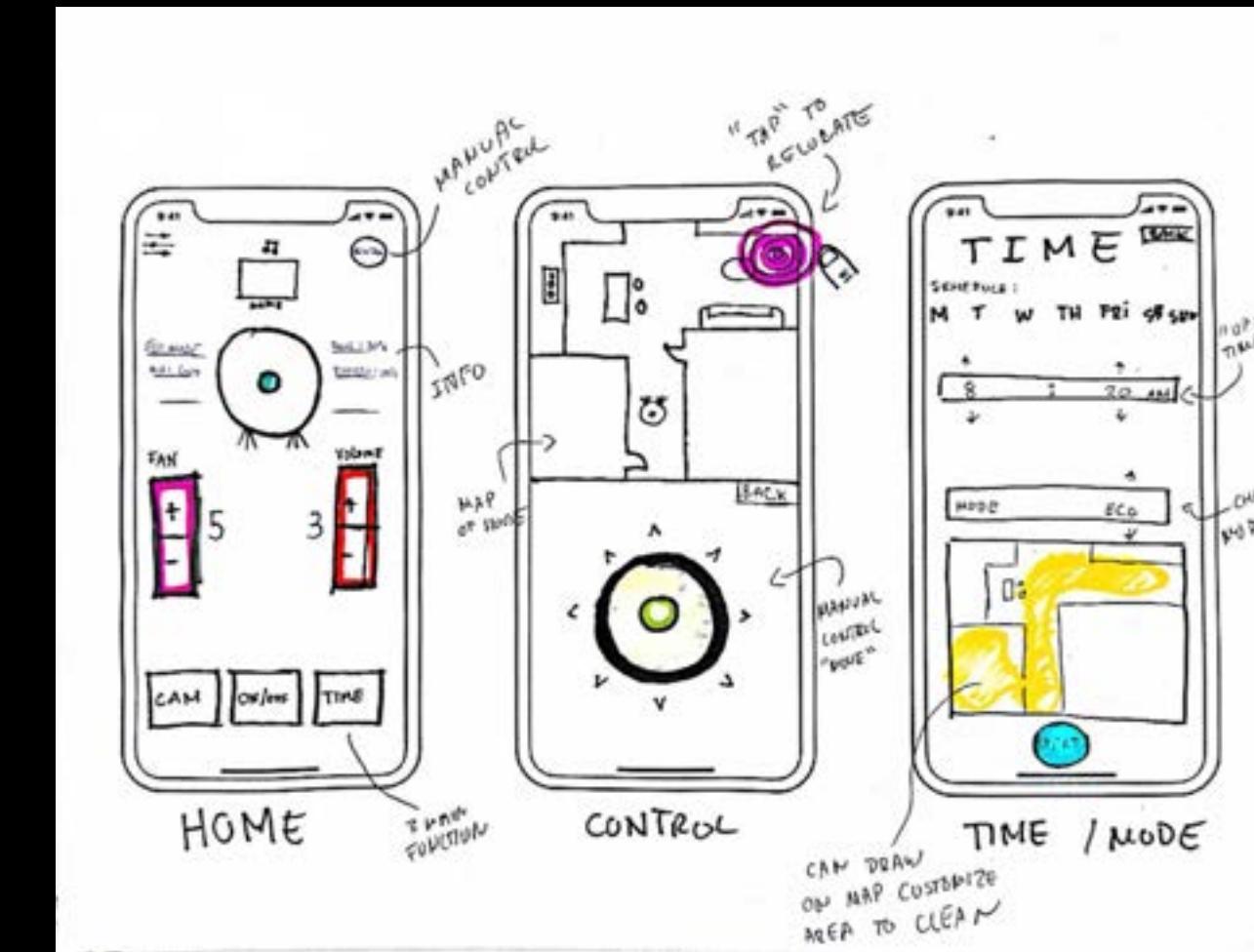
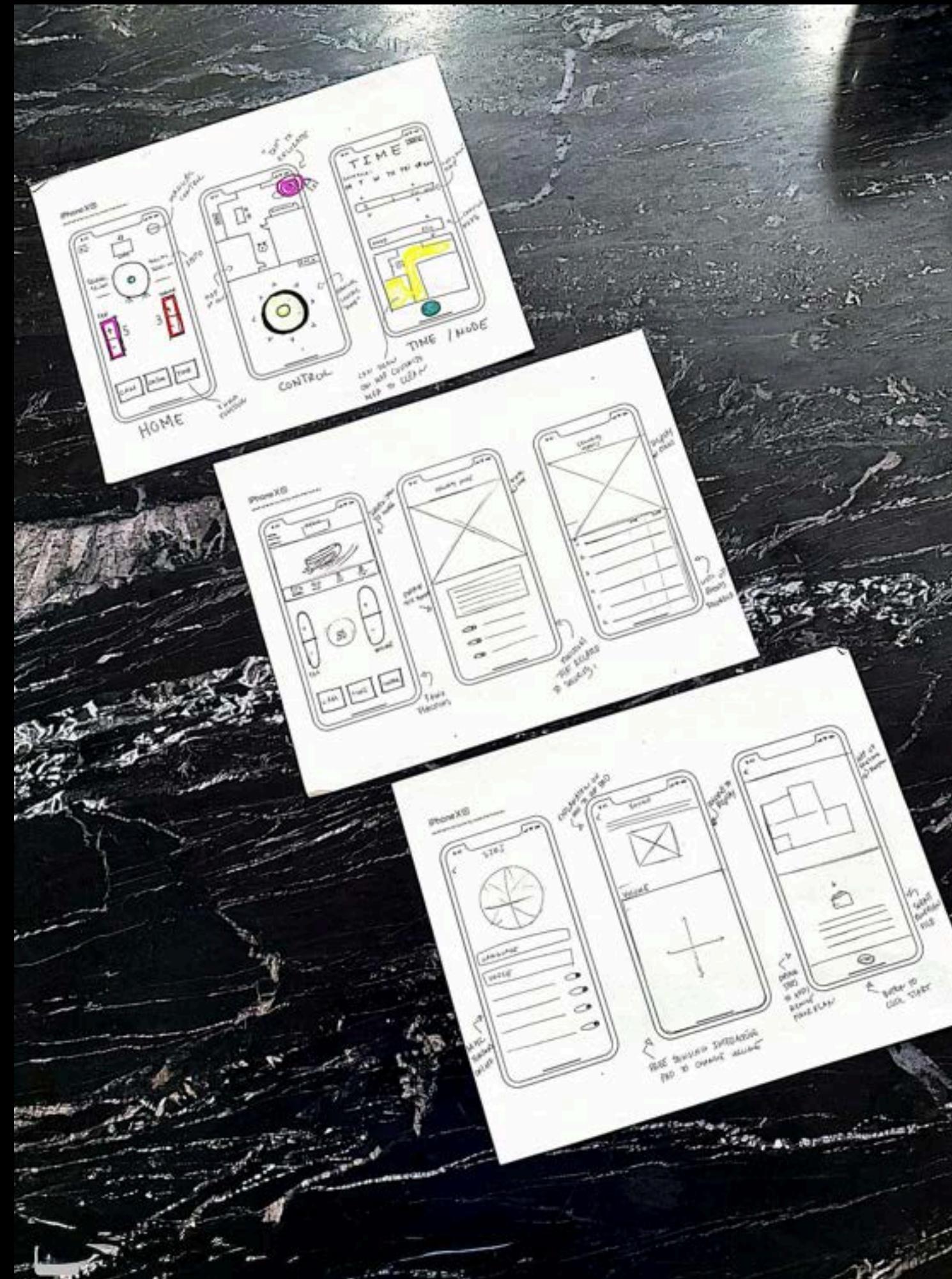
The smart vacuum is designed with the user in mind seamless to use and **accessible** for young or middle-aged consumer targeting toward age from 20s to 50s. Its **intuitive** features and simple controls cater to both tech-savvy users and those who prefer a more straightforward experience.

# App Control Study



- Strong visual presentation of product functions
- Efficient and user-friendly overall experience
- Highly engaging and keeps users actively involved
- Strong sense of unity and consistency throughout the interface
- Labeling could be clearer and more intuitive
- Feels unified in style but somewhat fragmented in navigation and flow
- Poor video playback quality
- Navigation is not always simple or intuitive

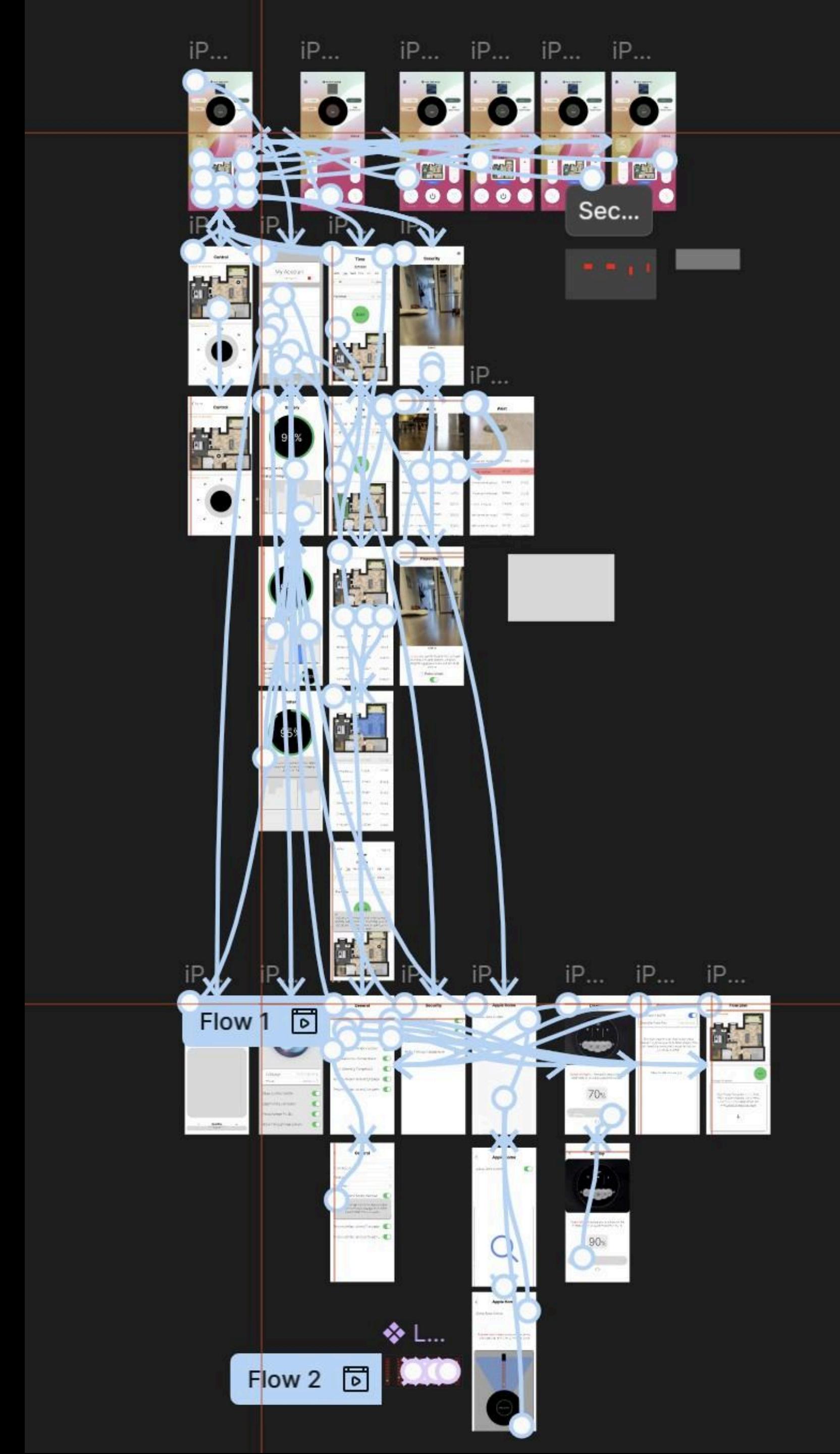
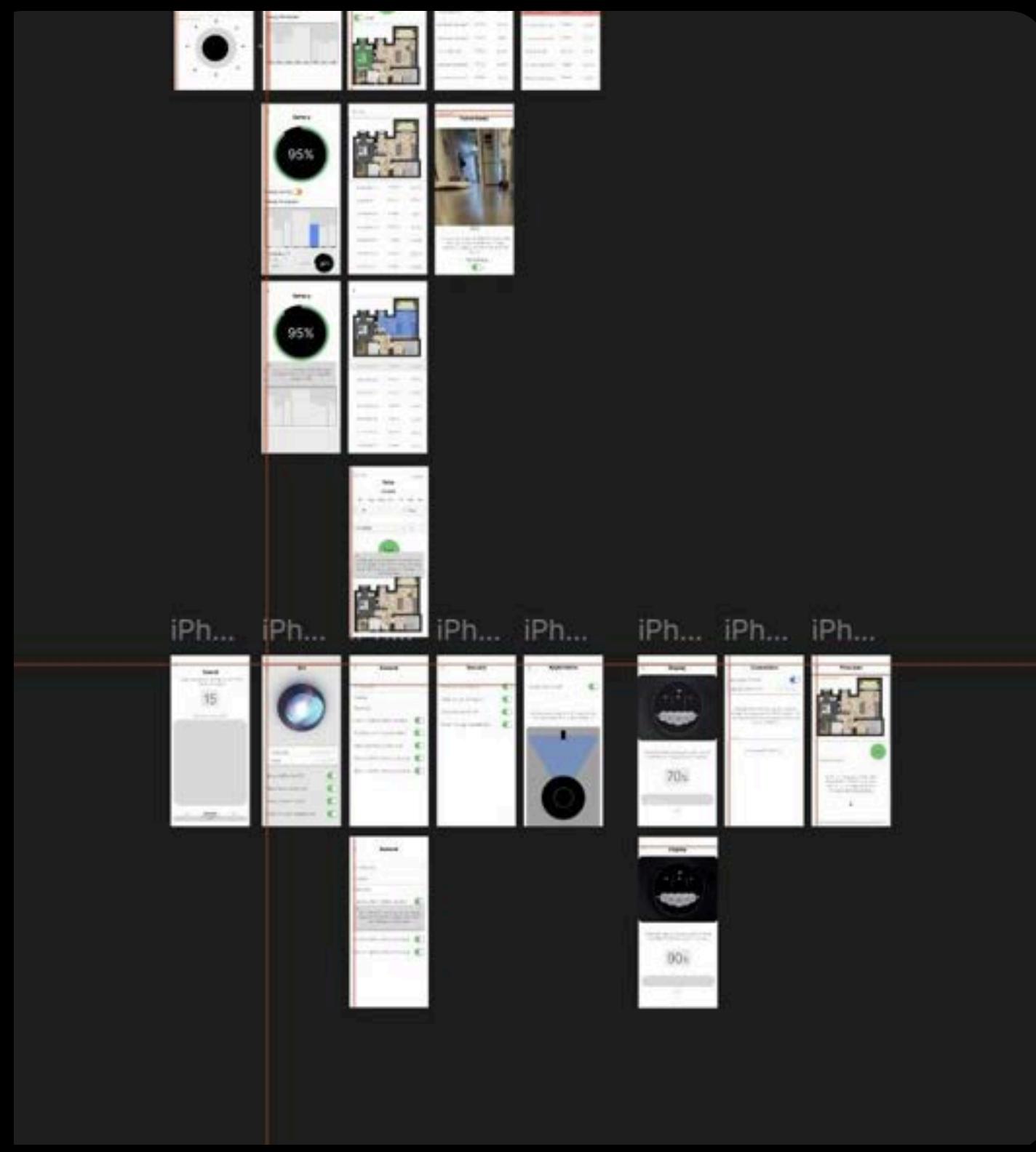
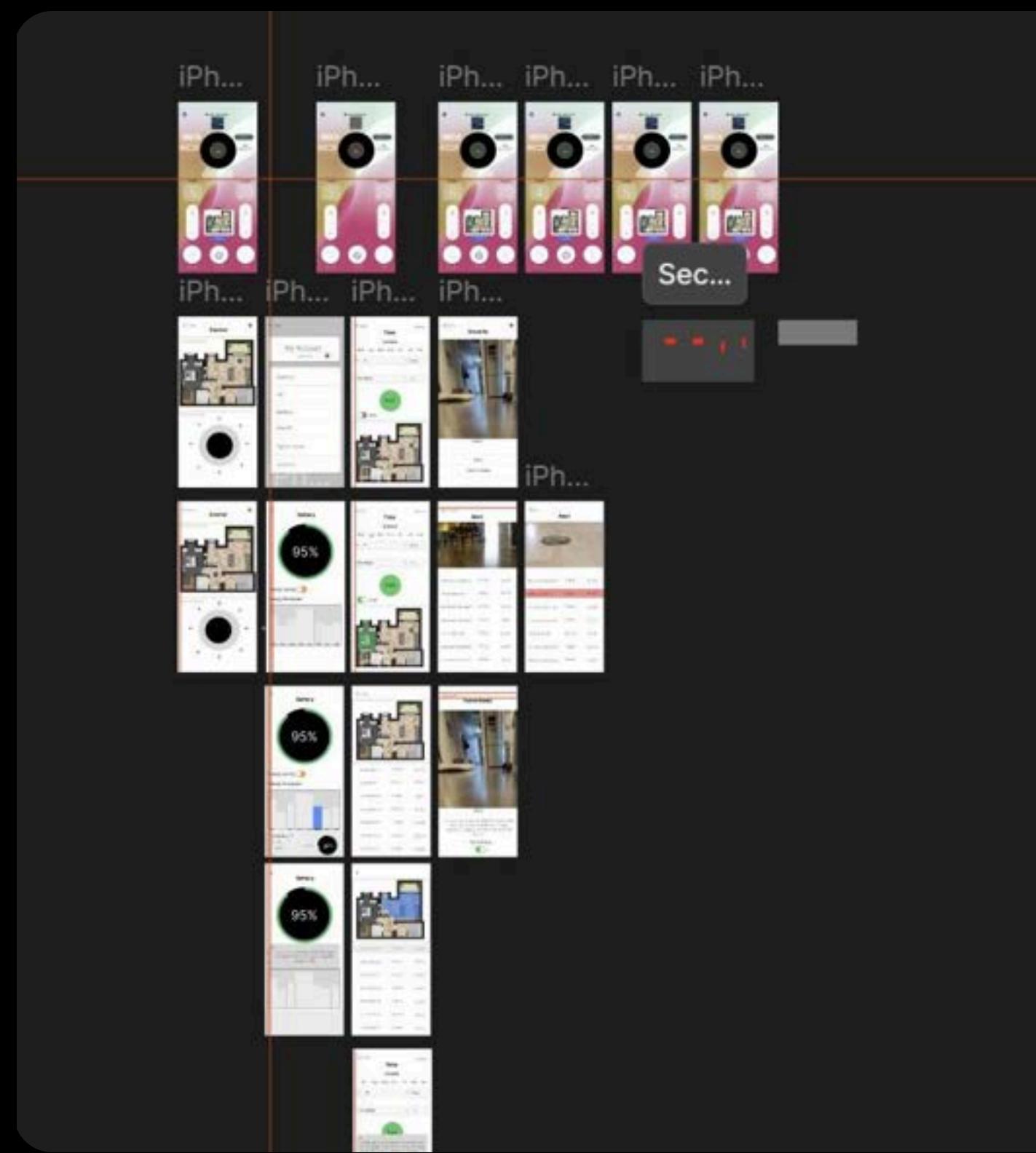
# App low fidelity



By evaluating the strengths and limitations of existing control apps, I applied their positive aspects and addressed their shortcomings through low-fidelity layouts and user flows.

# Wireframing

Developed a complete set of 35 Figma screens through iterative wireframing and refinement, resulting in a clear, functional prototype ready for user testing.



# USER TESTING



8 tests

I conducted one week of app testing with 8 participants representing the project personas, from students to elderly.

## KEY FINDINGS

1. Users misunderstood what Quiet Mode did
2. Users had trouble setting custom clean area
3. Alerts felt confusing and happened too often
4. Privacy concerns

## DESIGN CHANGES

1. addressed misunderstood what “March Mode”
  - Renamed “Quiet Mode” to “**Patrol Mode**” to better reflect its purpose
  - Added a short description explaining that Patrol Mode allows the robot to move quietly while monitoring the home
2. Created a “**Draw system**” that lets users mark areas on the floorplan they want cleaned, making the experience more flexible and straightforward.
3. Reduced alerts to two types: Movement alerts for unusual activity, and hazard alerts for liquid spills or objects like nails that could damage the machine.

Continue...

# #4 TRUST AND PRIVACY BASIC

While developing the product and talking with users, privacy concerns around having a camera on a robot came up often. This pushed me to rethink and iterate on my design to better respect user privacy while keeping the product practical and approachable.

## **The camera will be on 24h?**

- Camera is off by default and only activates when the user turns it on “**Patrol Mode**”

## **Does it indicate if the camera is on?**

- Clear in-app indicator shows when the camera is active

## **Can you turn off the camera?**

- Physical shutter option allows users to fully block the camera

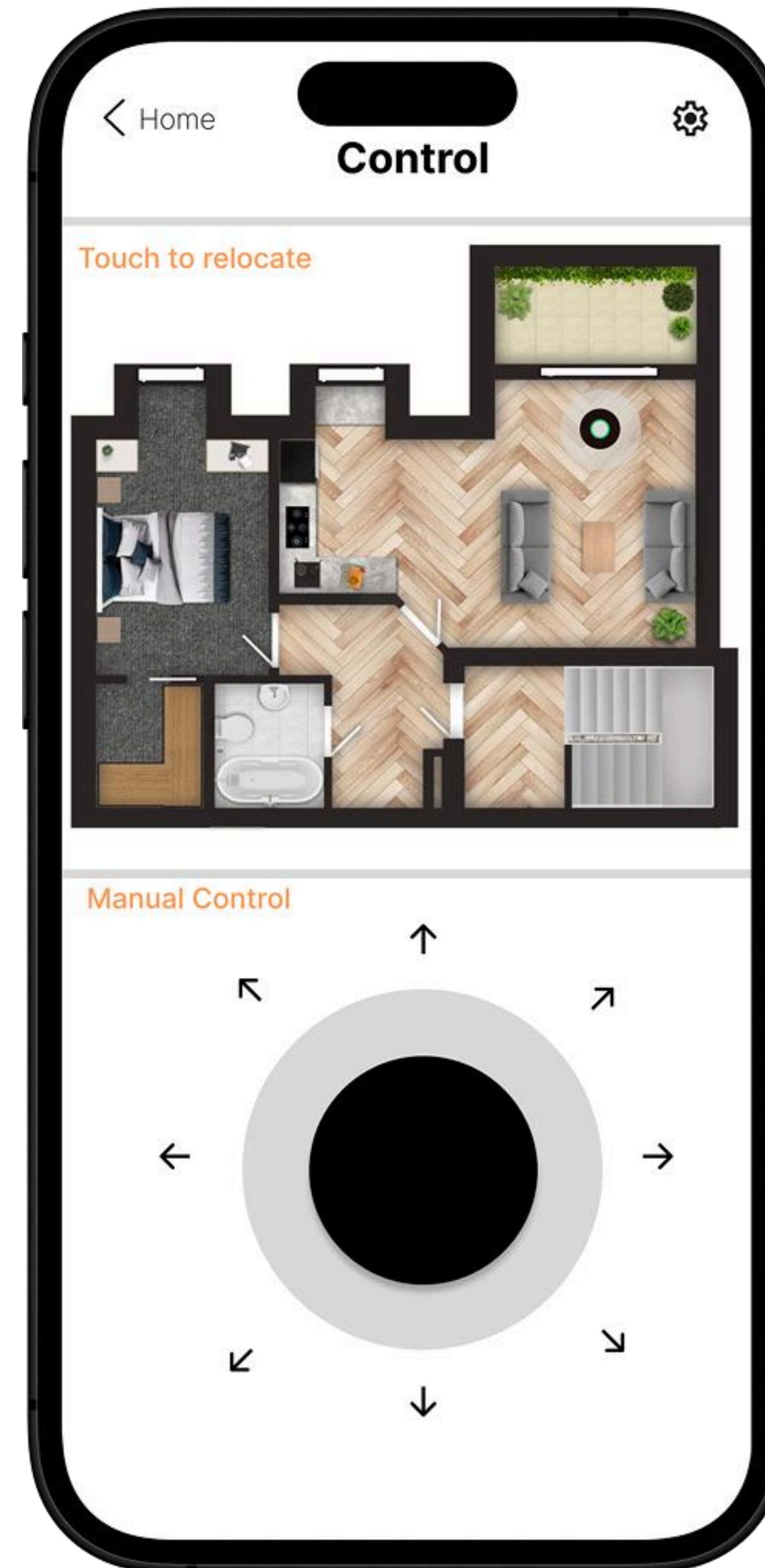
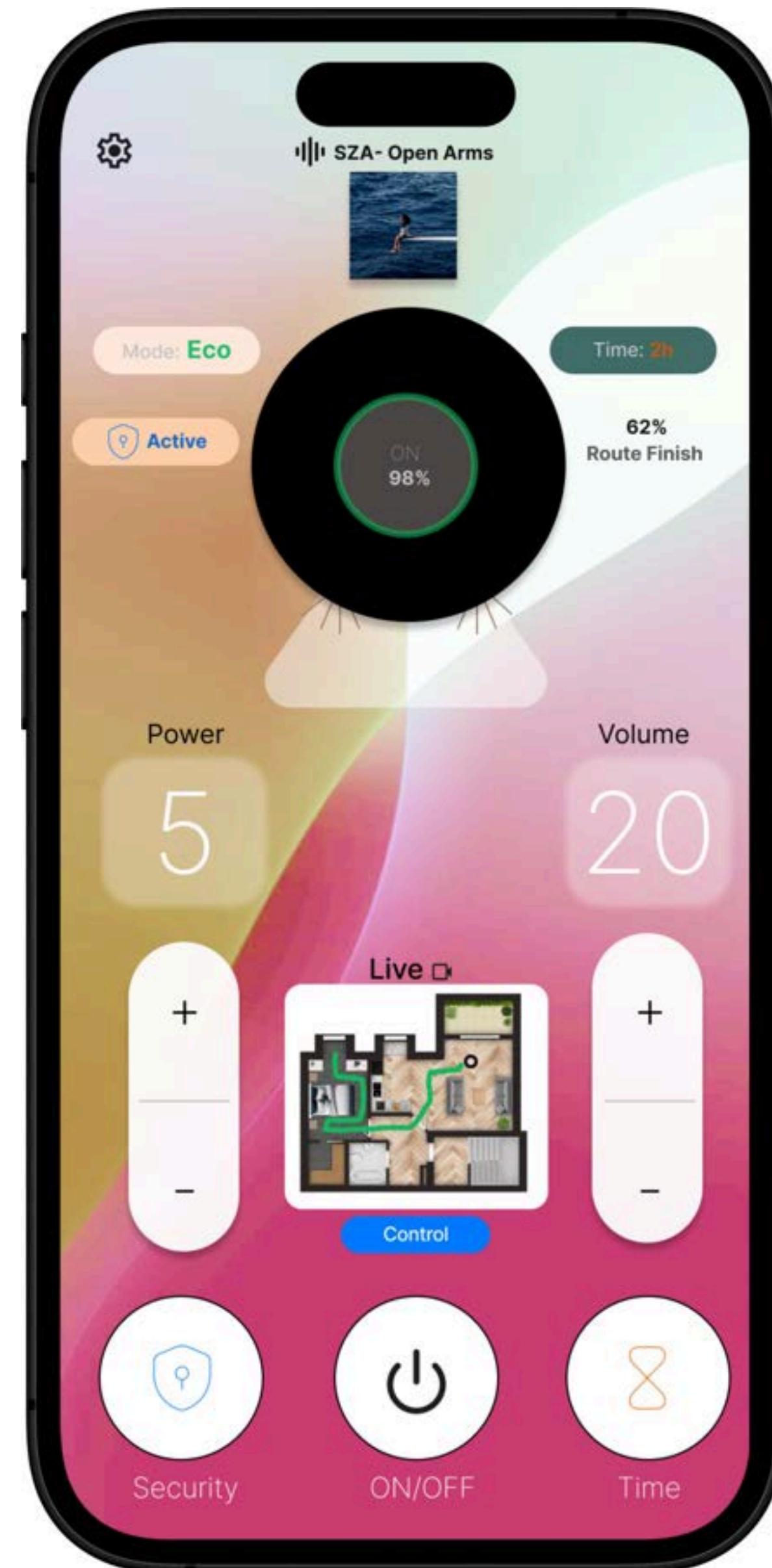
## **How does the robot protect user privacy?**

- The robot processes sensitive detections on the device itself, so less personal data is sent to the cloud.

## **How do others in the home know when the robot is active?**

- Guest and shared household modes provide transparency for others in the home



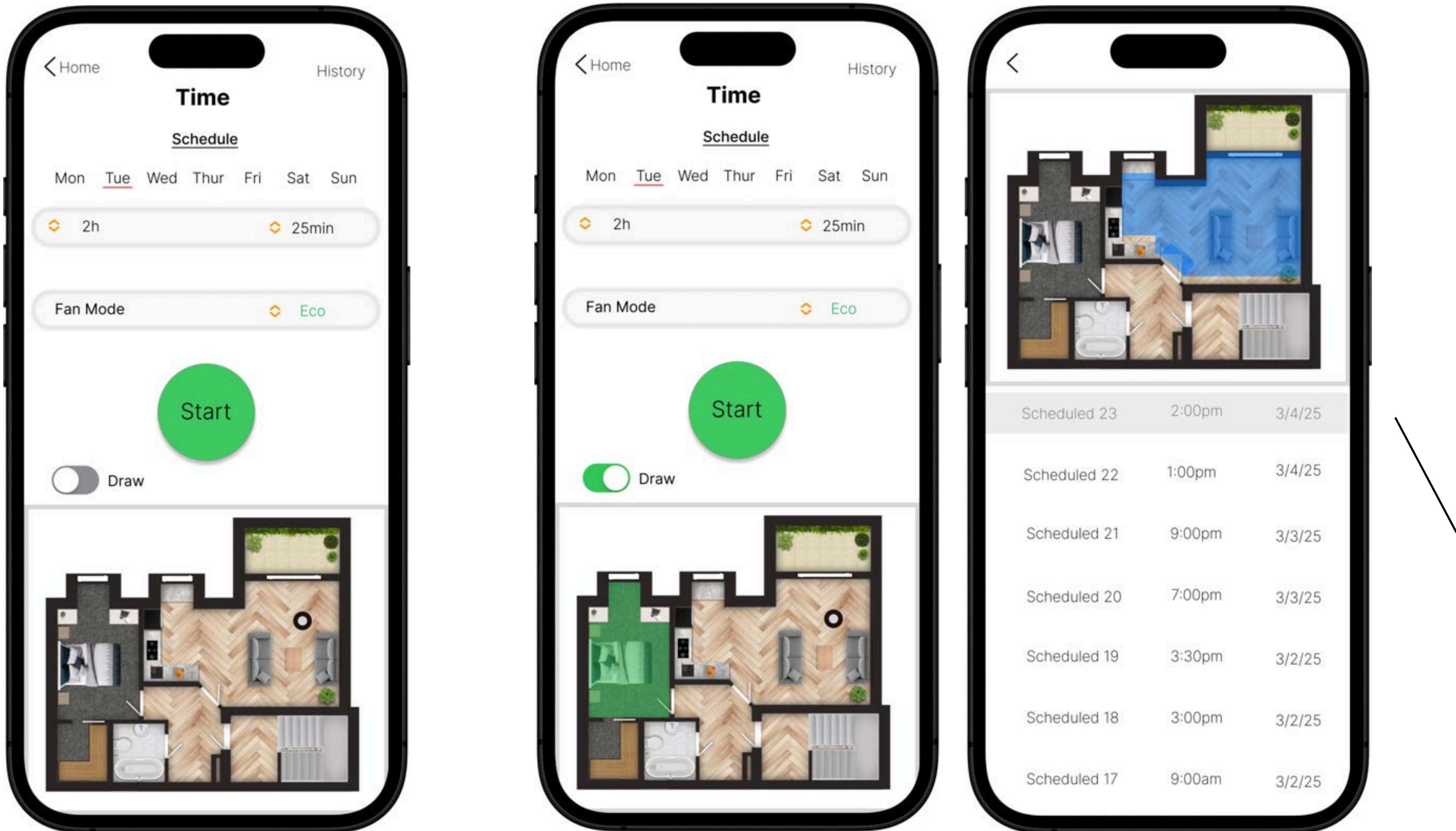


## Main screen

The main screen has easy-to-use buttons for controlling the fan power and volume, making it simple to access key features. It also acts as the central hub for all other functions.

The control screen offers two options: a map view to relocate the vacuum with a double-tap and a manual knob to help when the vacuum gets stuck.

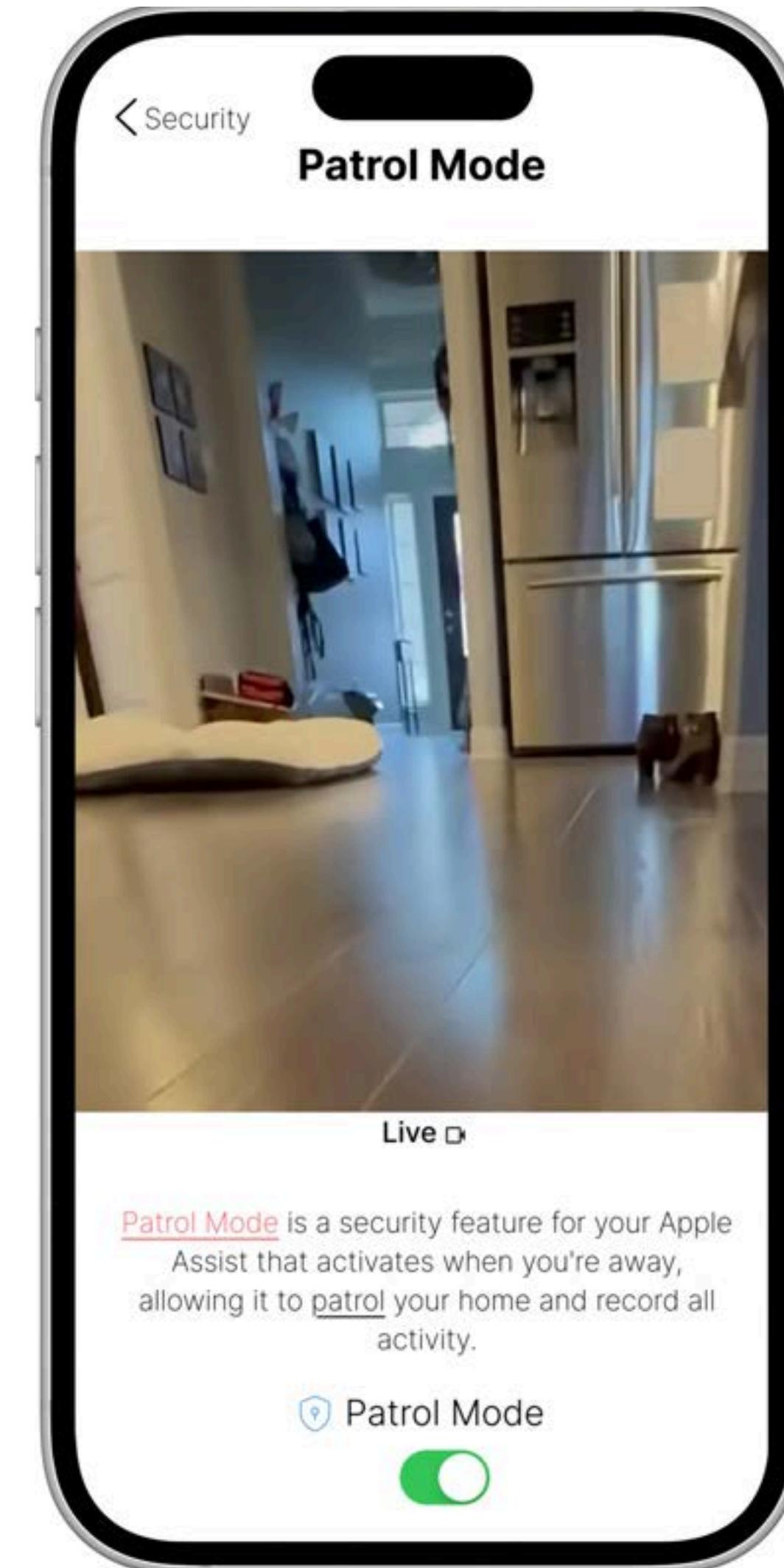
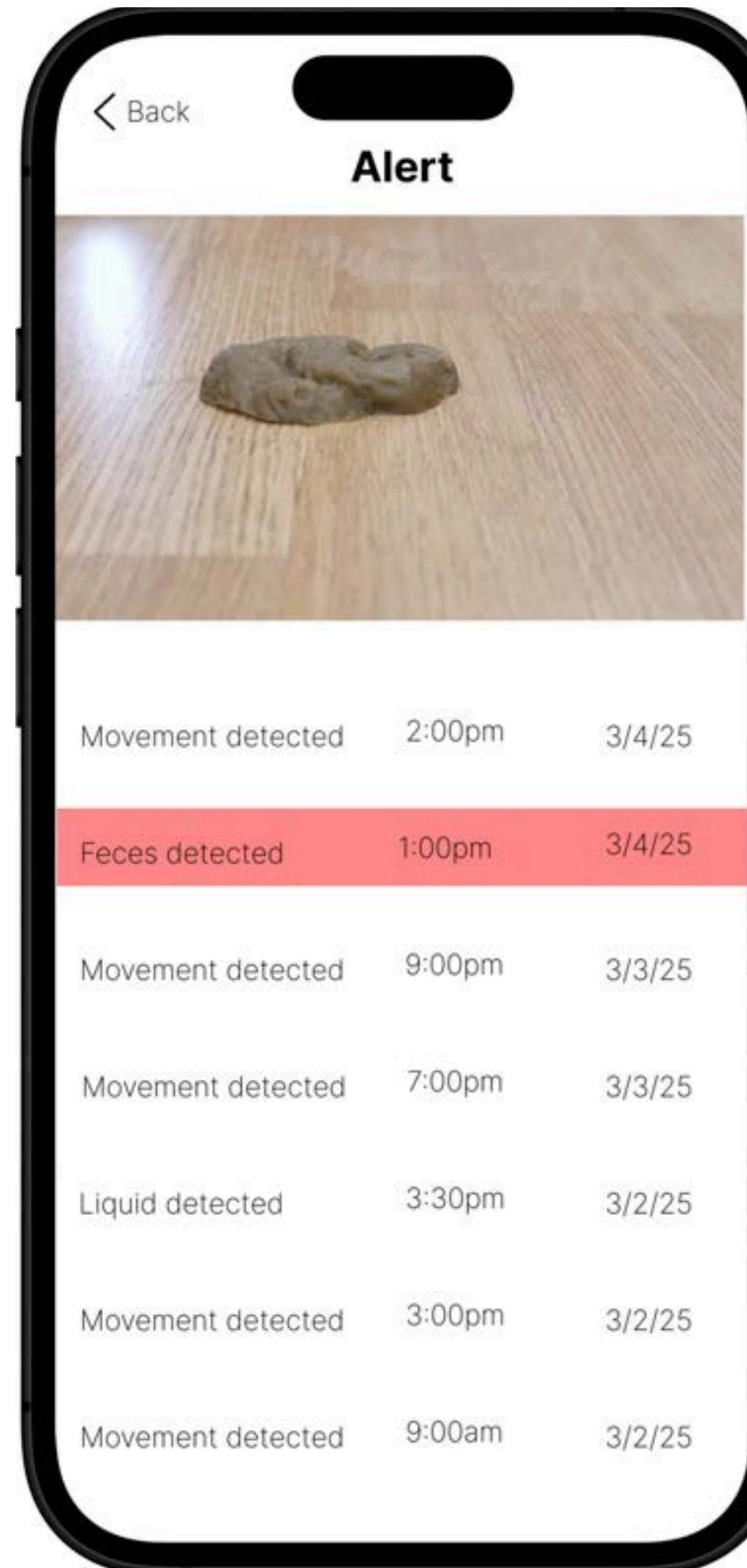
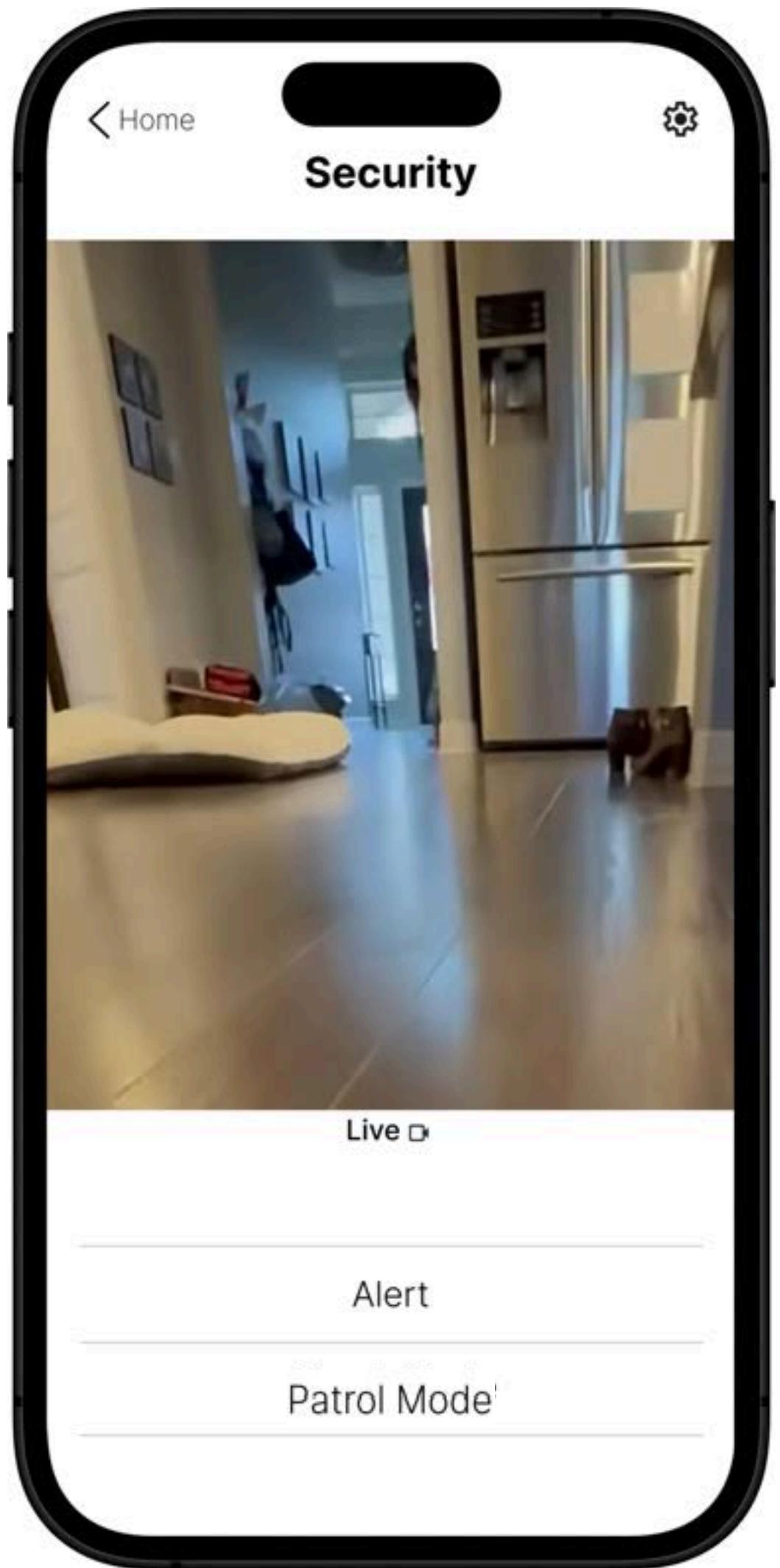
## Time screen



The Time screen lets users schedule cleanings and customize areas by drawing on the floor plan. It also shows completed areas, and users can scroll back to review past sessions.

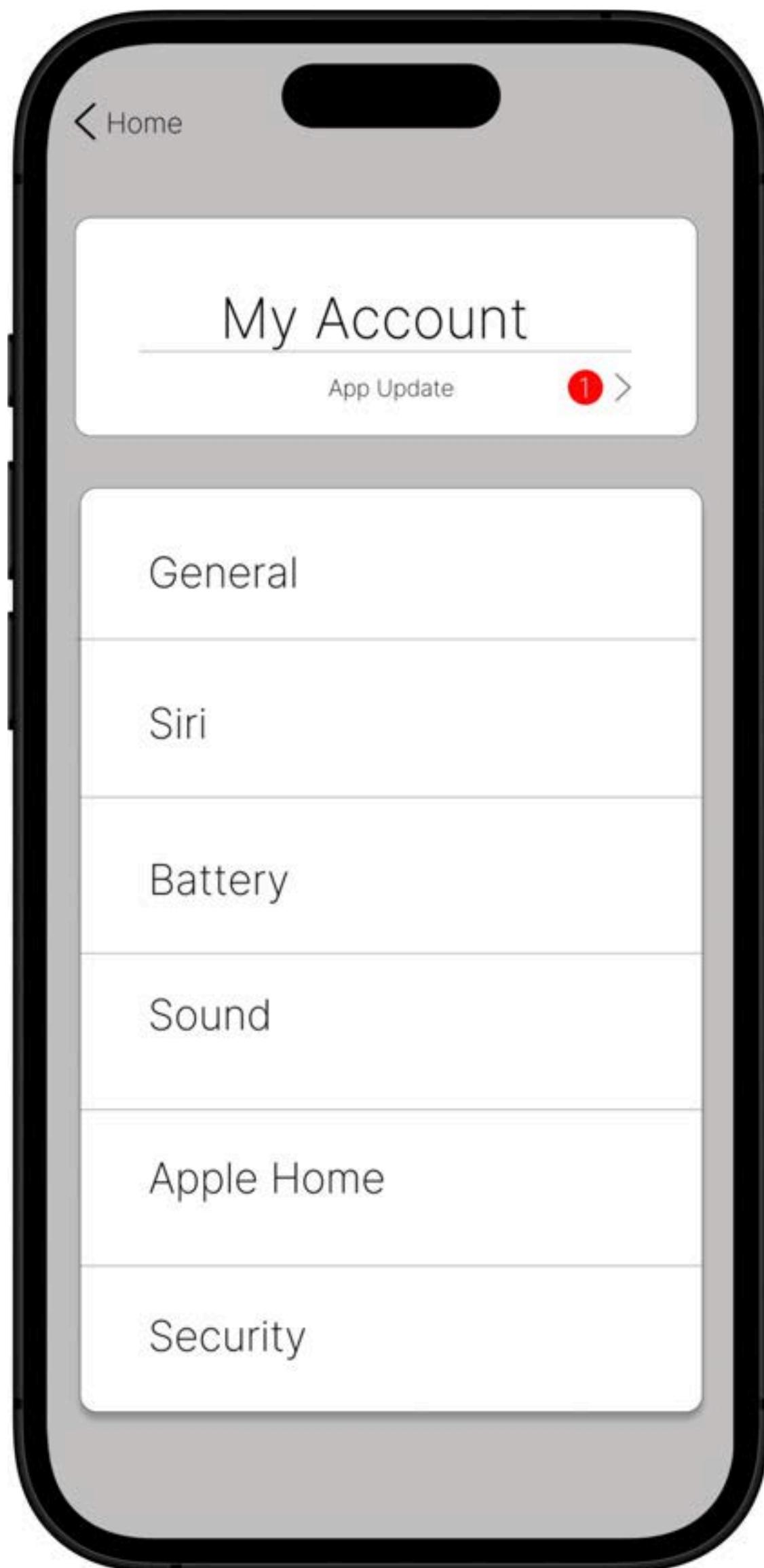
**Users can scroll back to review sessions**

## Security features

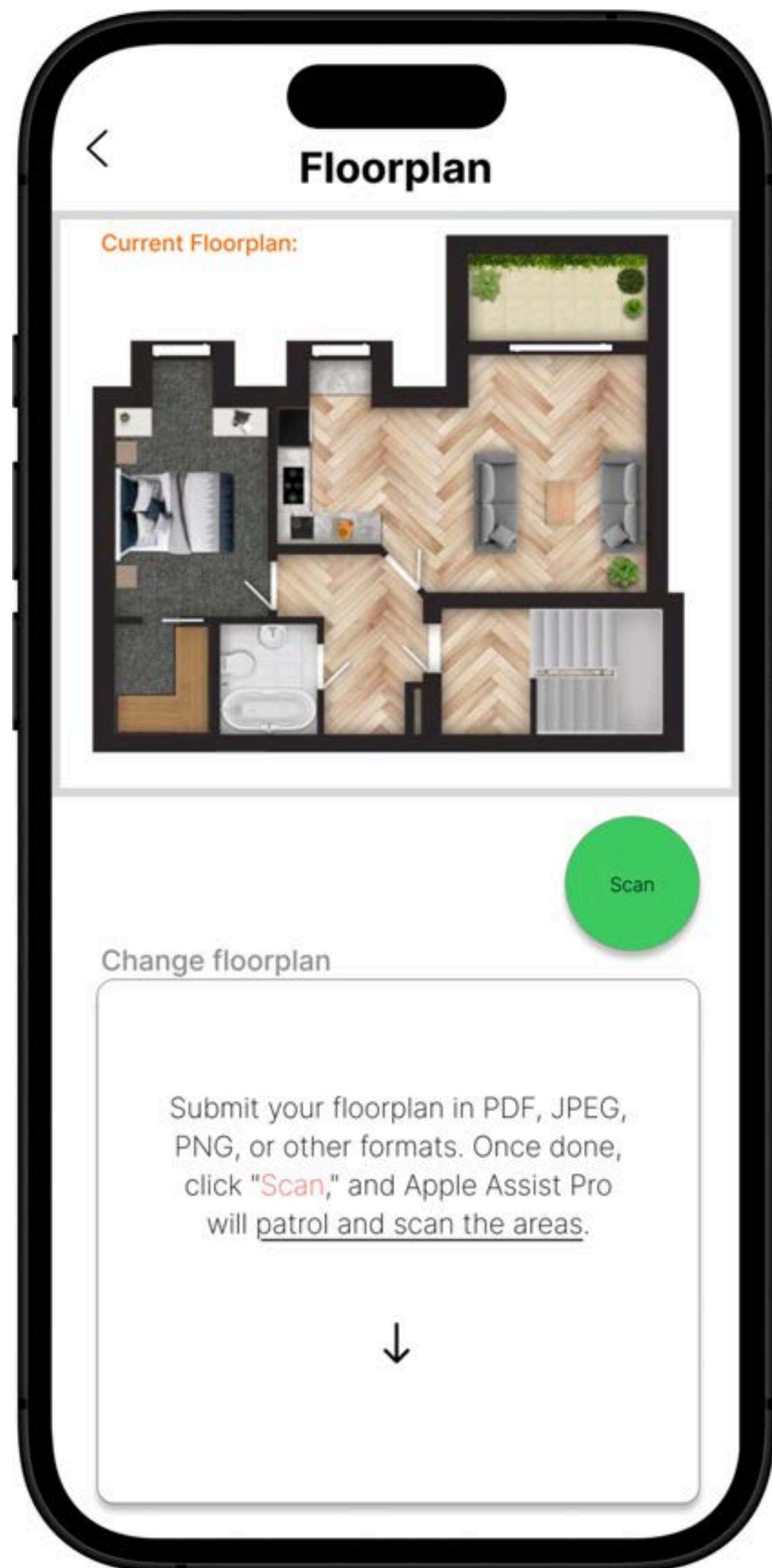


**scanning at 60 fps**

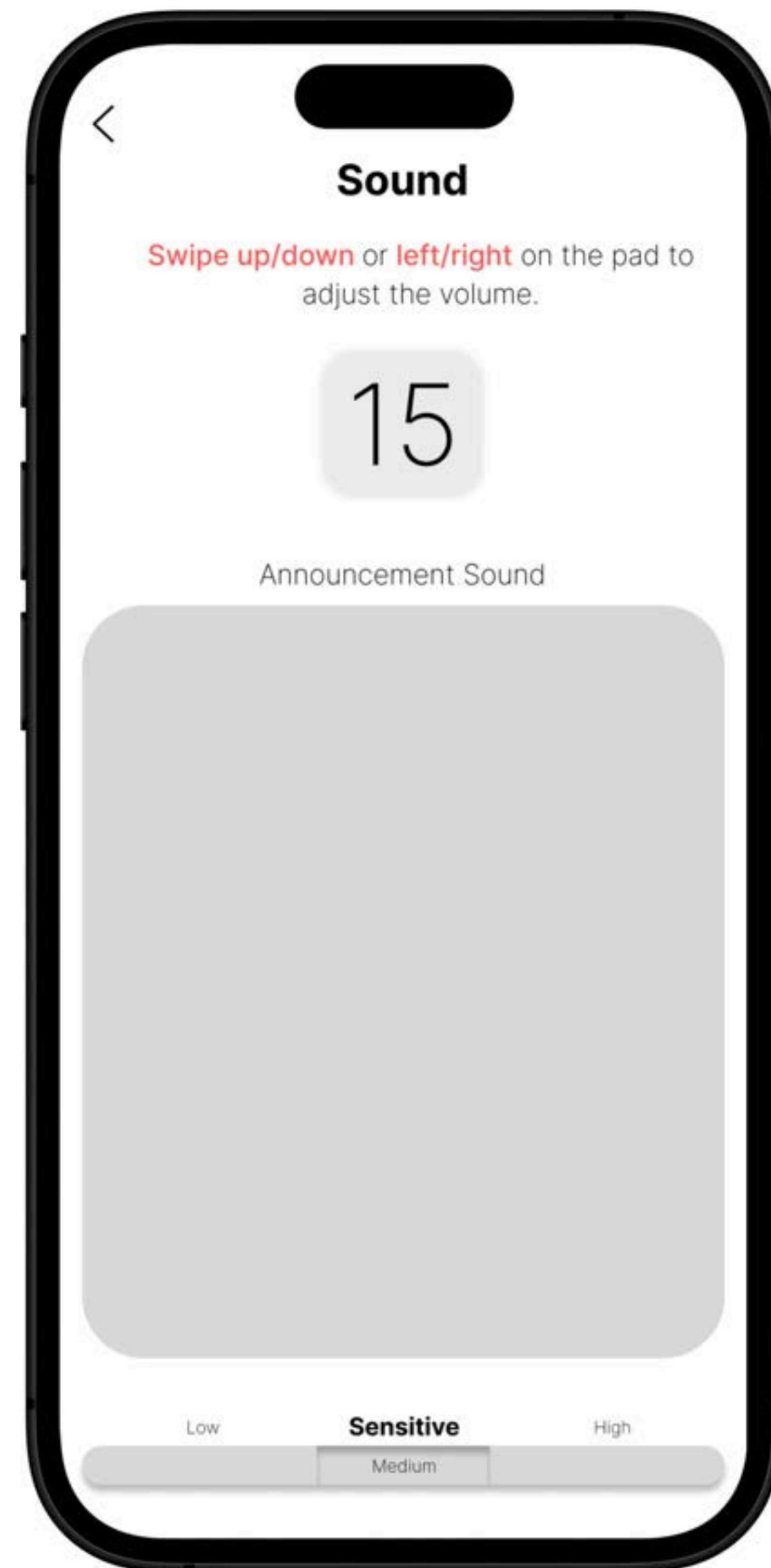
Patrol Mode monitors your home with live video, scanning at 60 fps to detect movement, spills, or messes. The Apple Assist Pro app sends instant notifications, and all alerts can be reviewed on the Alerts screen.



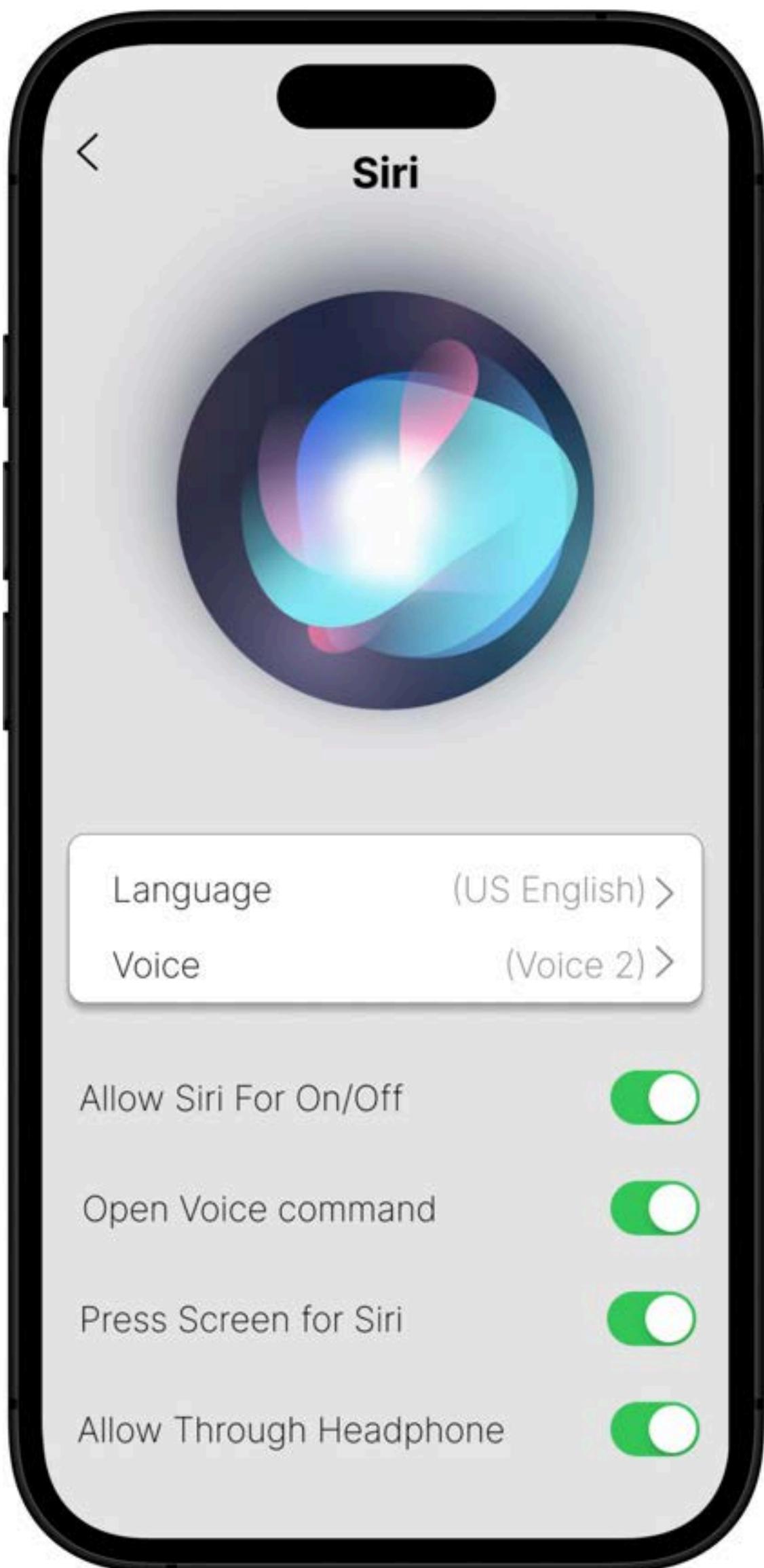
## Features



Floorplan screen allow the vacuum begins by scanning your home to create a floor plan, with options to add or reset maps.



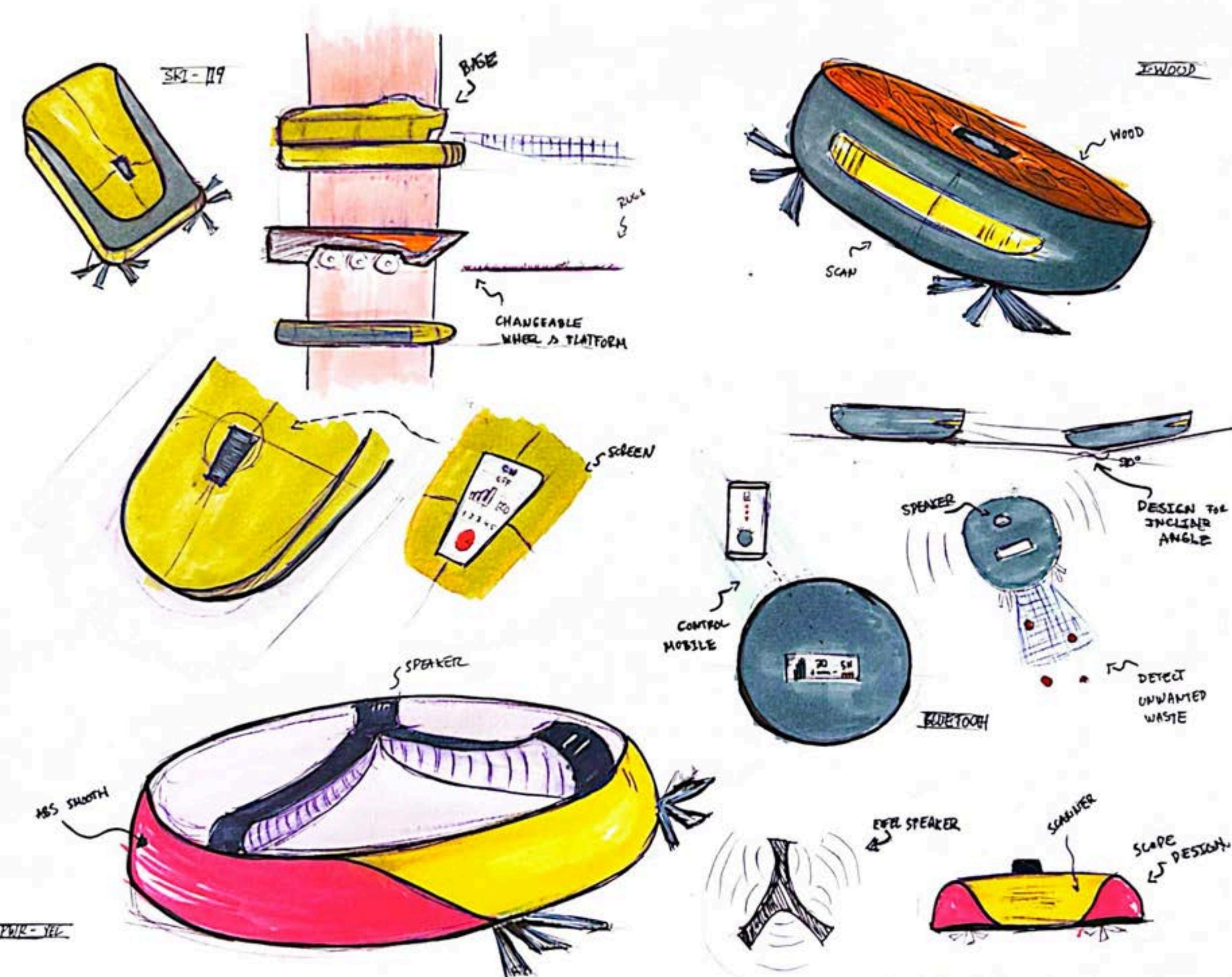
Sound Control responds to directional swipes (up/down or left/right) and circular clockwise, Live volume number reflect changed



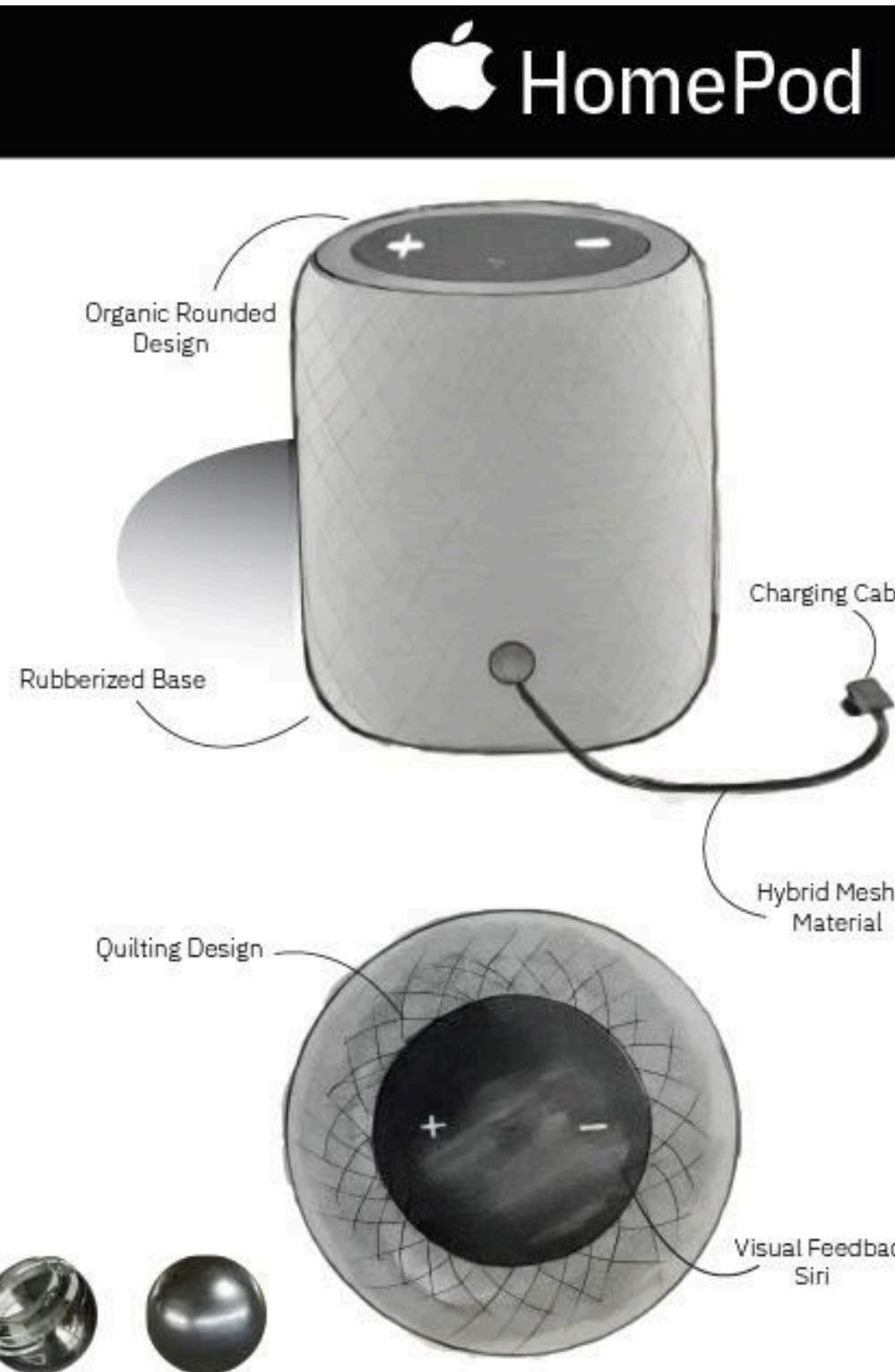
Built-in AI lets users control lights and temperature by voice and ask everyday questions.

# ID process

## IDEATION SKETCHES



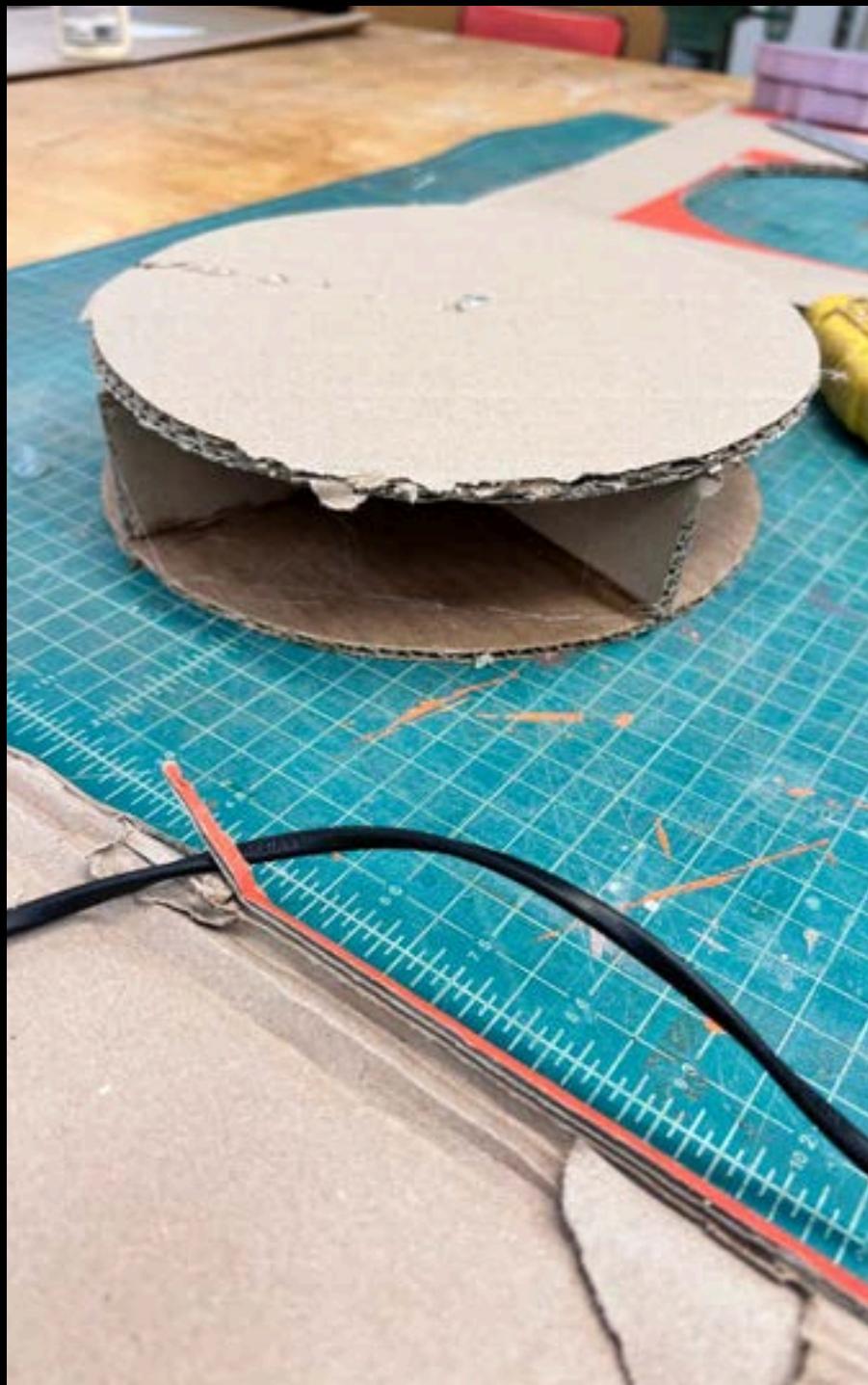
## Product Line Extension



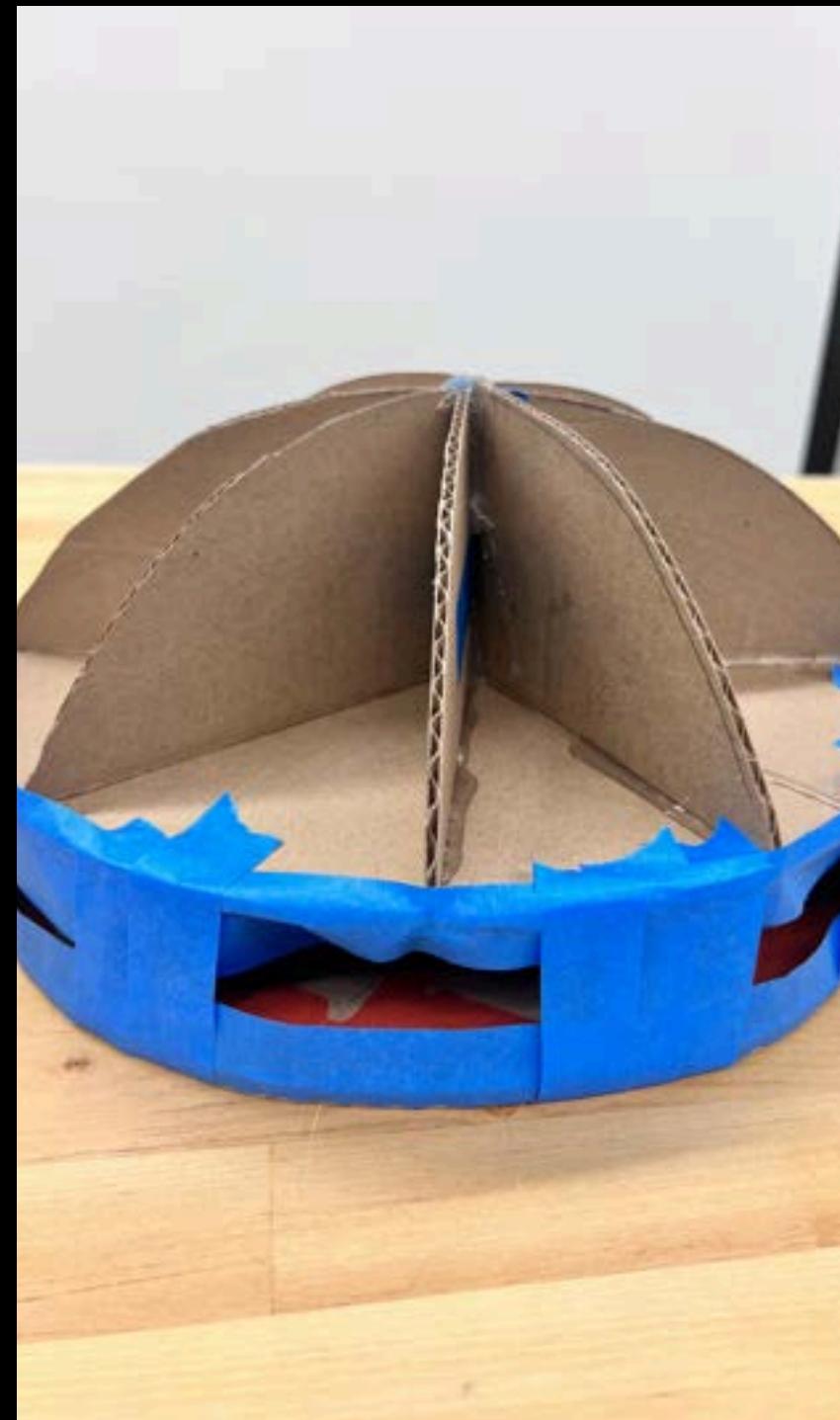
Bryan Nguyen-Son | DES 360

Materials: Mesh, Rubber, Glass, Steel

## PROTOTYPE



Low fidelity 1



Low fidelity 2



Low fidelity 3



FINAL

## MANUFACTURE



Polyurethane



sanding



Laser cutting



Bondo/paint



# Project 2

## **Industrial & Interaction designer**

This project investigates how affective computing systems can support emotional regulation while maintaining clear ethical boundaries, user consent, and a non-diagnostic role.

**Collaboration:** Solo work

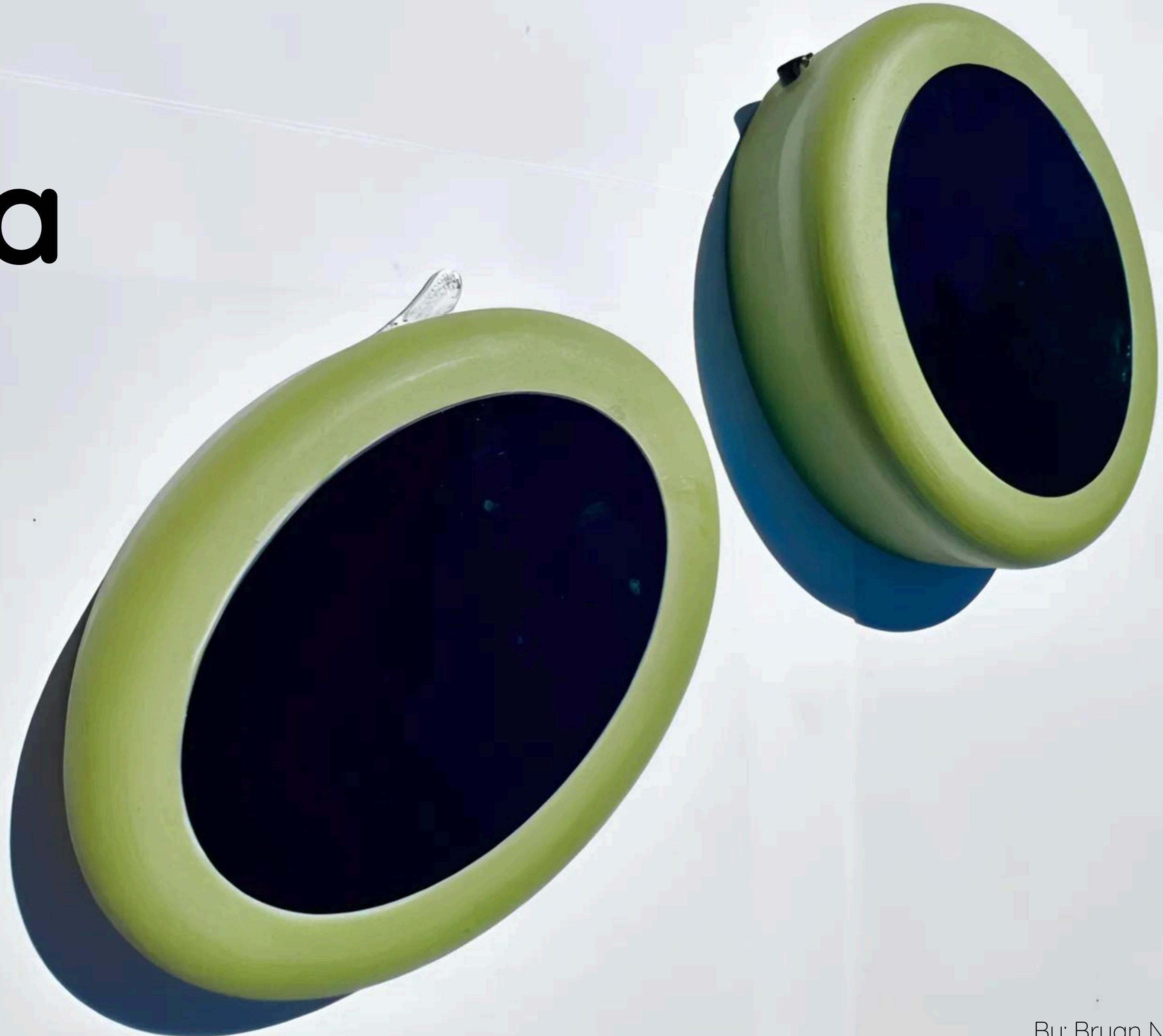
**Durations:** 1.5 month

**Methods:** interviews / usability test / expert feedback / prototyping

**Deliverables:** physical prototype

Introducing All New  
**MoodAura**

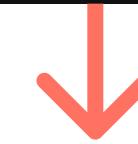
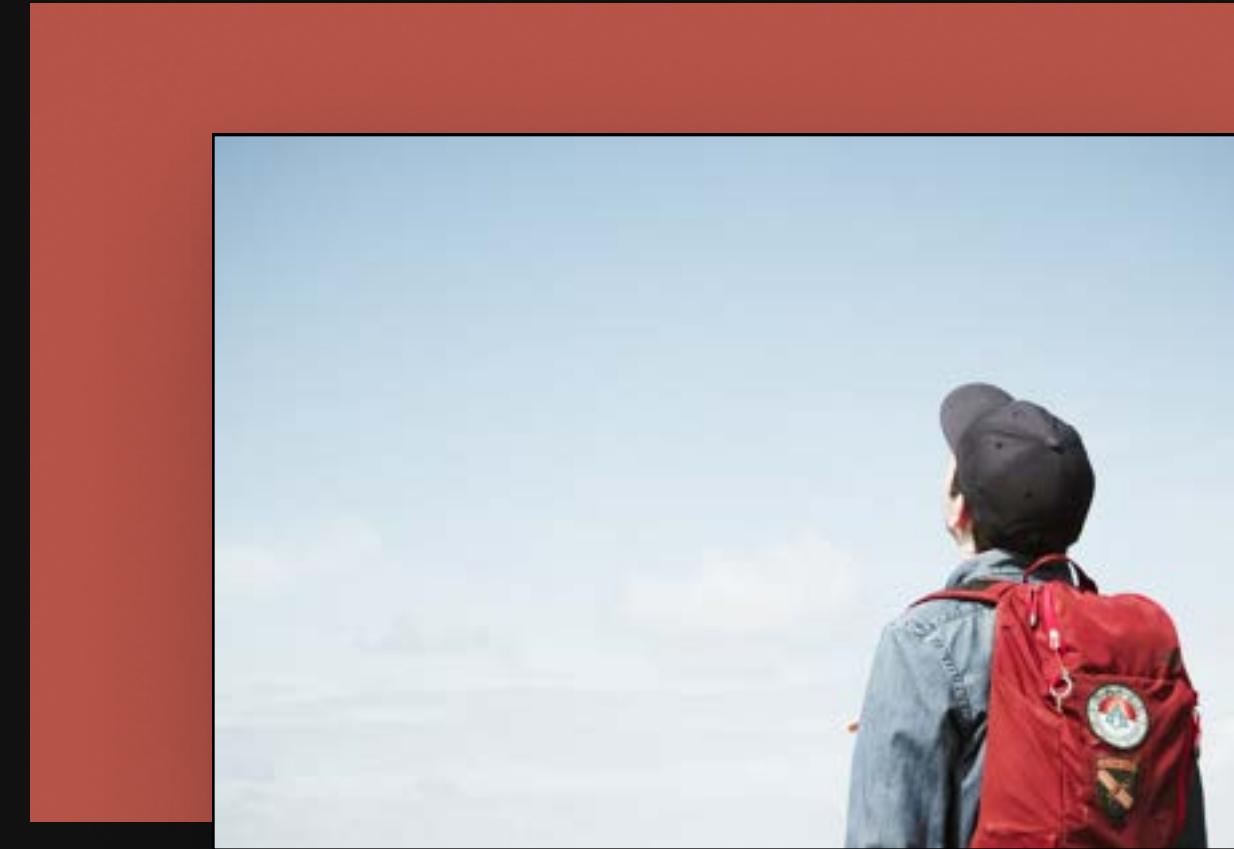
Neurofeedback + AI Technology



By: Bryan Nguyen-Son

# Problem Statement

Young adults experience recurring stress and emotional fatigue, often without access to immediate or discreet support. Existing mental health tools are either too clinical or require active phone interaction, making them difficult to use during vulnerable moments.



## Design Brief :

**Who:**

Young adults aged 20–34, especially Gen Z and Millennials, facing stress and emotional fatigue from work and life transitions.

**What:**

A wearable mental health device that uses EEG sensors and AI to detect emotional states. It provides real-time support through voice interaction, music, and adaptive airflow to help regulate emotions.

**Where:**

Primarily used at home or in any comfortable personal space.

**When:**

Most effective from late afternoon to night (5 PM–12 AM), a common time for reflection and emotional release—but can be used anytime support is needed.

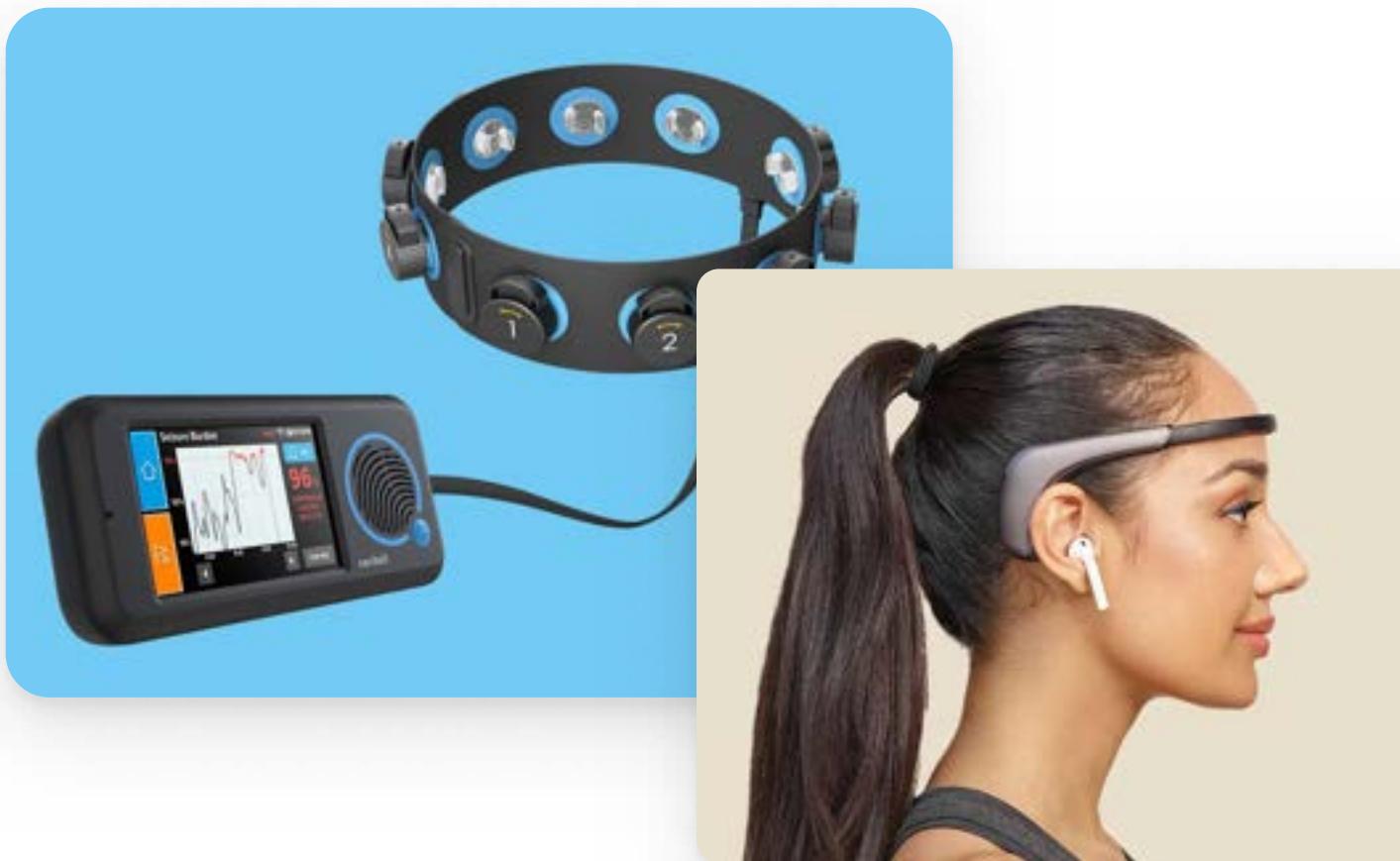
**How:**

By offering private, on-demand emotional support, it helps users manage stress and emotions when therapy isn't accessible, preventing mental strain from building up.

# Research

## Pain Points:

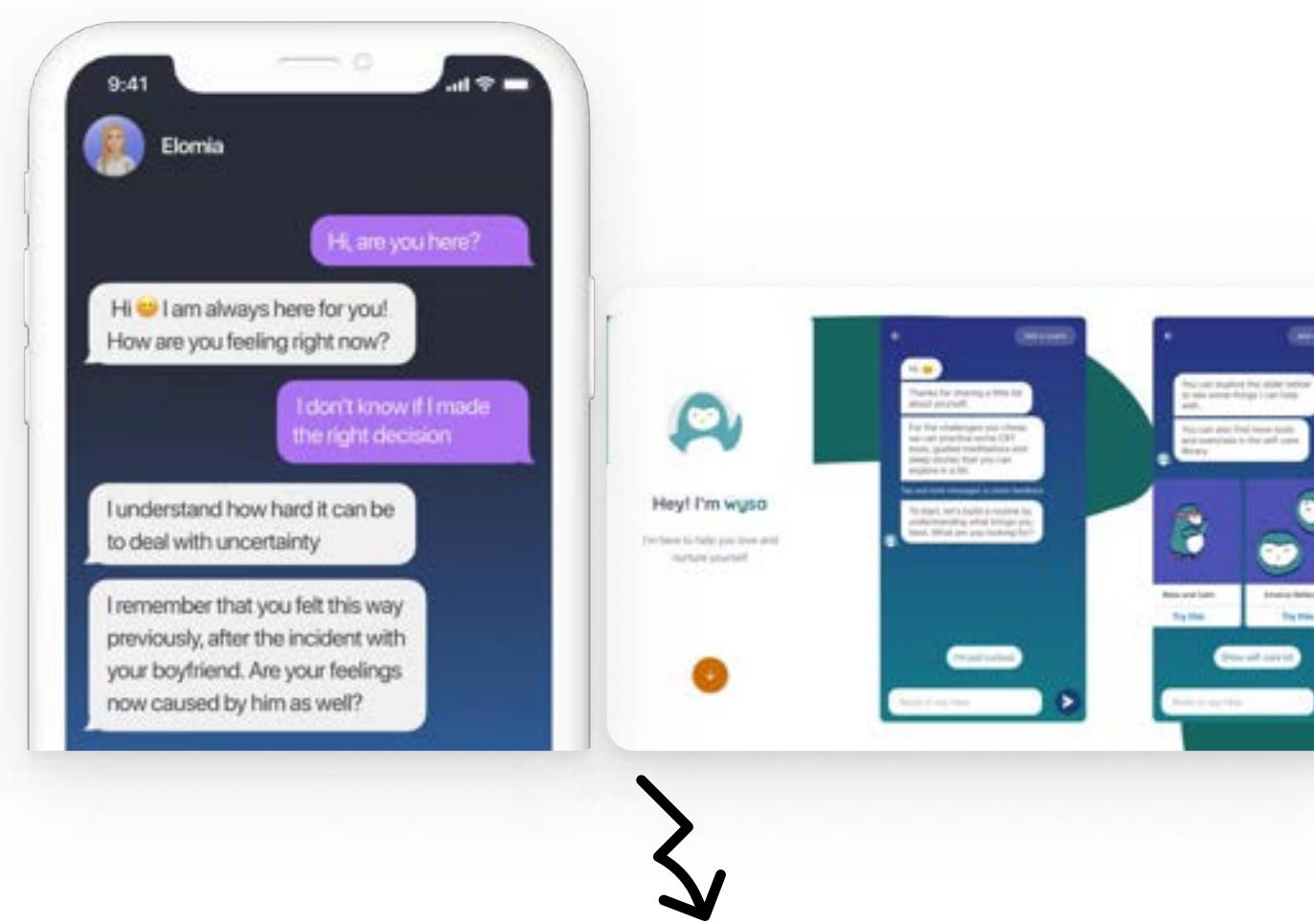
- Feels uncomfortable with overhead strap and claustrophobic
- People don't want to wear medical-looking devices
- AI apps lack warmth and repetitive



Most EEG headbands don't engage with users and feel too medical or clinical.

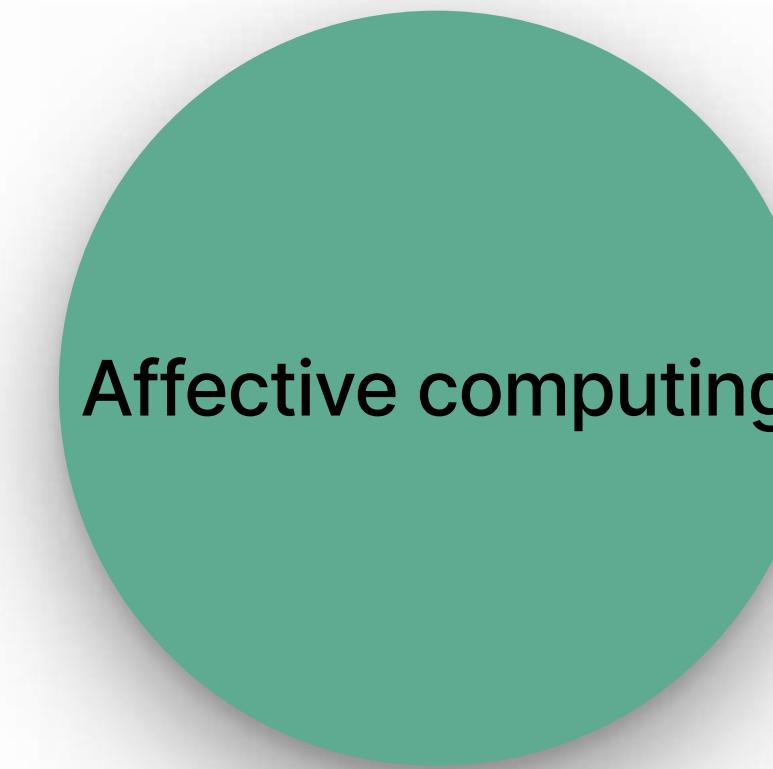
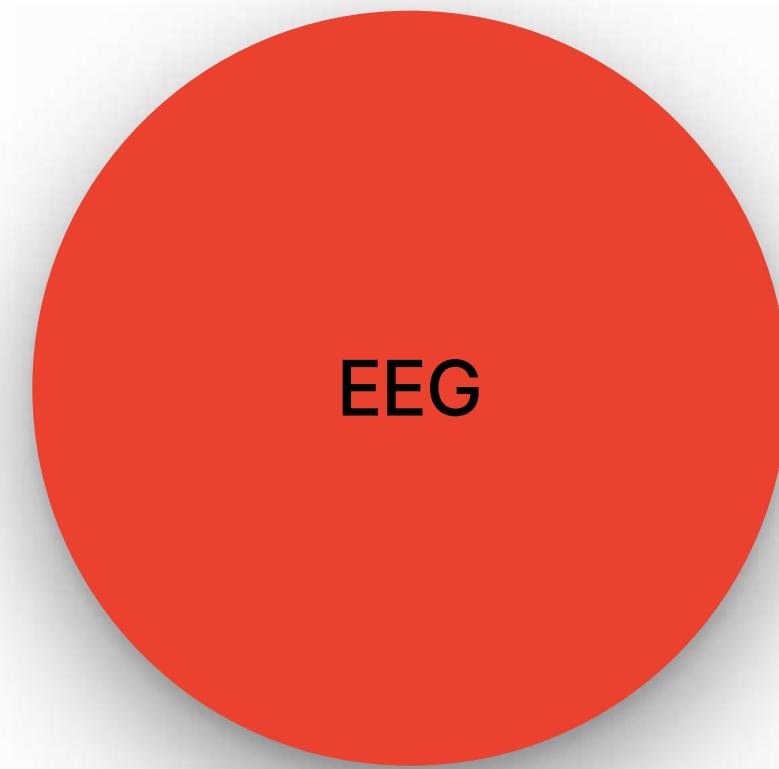
## User Needs:

- A discreet, daily-use product that feels natural
- Comfort and warmth, especially around ears/neck
- Wanting more human senses like touch, smell, or listen in sensing therapy product



Most AI therapy apps still rely on basic emotion-guessing algorithms and can be distracting when used on a phone, pulling users away from a calming space.

# Technology & Features



MoodAura Technology Concept



**EEG** tracks brainwave activity to indicate levels of stress or focus, but it does not identify specific emotions.

**Affective computing** technology reads facial and vocal cues to suggest what emotions a person may be expressing.

AI works by recognizing patterns. By combining internal biosignals with external emotional cues, it can form a better estimate of a person's emotional state.

Features	What It Does	Why It Helps
EEG + Affective Computing	Detect user's mood/stress state	Enables real-time feedback + personalization
Heat pads	Warm areas behind ears/neck	Physically soothes user, change mood
AI assistant	Offers trained empathy, guidance, music, CBT-style prompts	Gives user a sense of companionship and support
Ergonomics	without bulky overhead wrap, something comfortably like earbuds	Users feel less claustrophobic and comfort in wearing it

# Safety & Ethical Guardrails



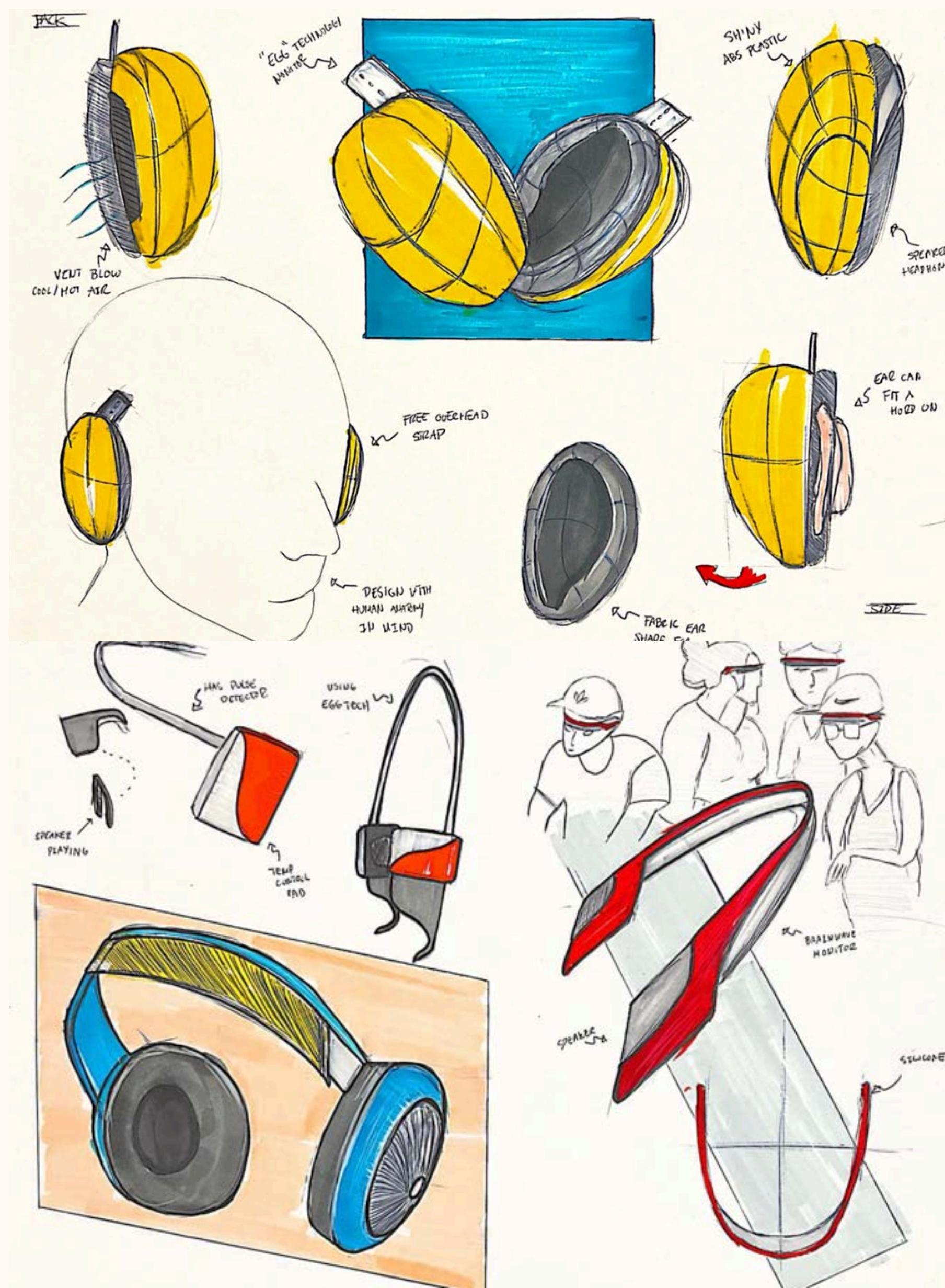
This project explores how emerging affective computing technologies can be designed with clear boundaries, user consent, and ethical responsibility. Given the sensitivity of emotional data, the system was intentionally designed to support reflection rather than diagnosis, prioritizing transparency, user control, and trust throughout the experience.

- 1. The system suggests support, it does not diagnose emotions or mental health conditions**
- 2. Users confirm intent before each session begins**
- 3. A “Not accurate?” option allows users to correct or dismiss system interpretations**
- 4. Data is minimized, with options to store less or delete session data**
- 5. Clear crisis boundaries guide the system to recommend professional help when needed**

# How Does It work?



# Design process



During the prototyping phase, different forms were explored to ensure comfortable ear fit and to determine optimal placement of the EEG sensors.

# Professional Feedback



I collaborated with Isma Ahmed, a therapist at Lifelong Medical Care in Oakland who works with patients facing substance use and childhood trauma. Her ongoing feedback from the beginning to the end helped refine and strengthen the final direction of the product.

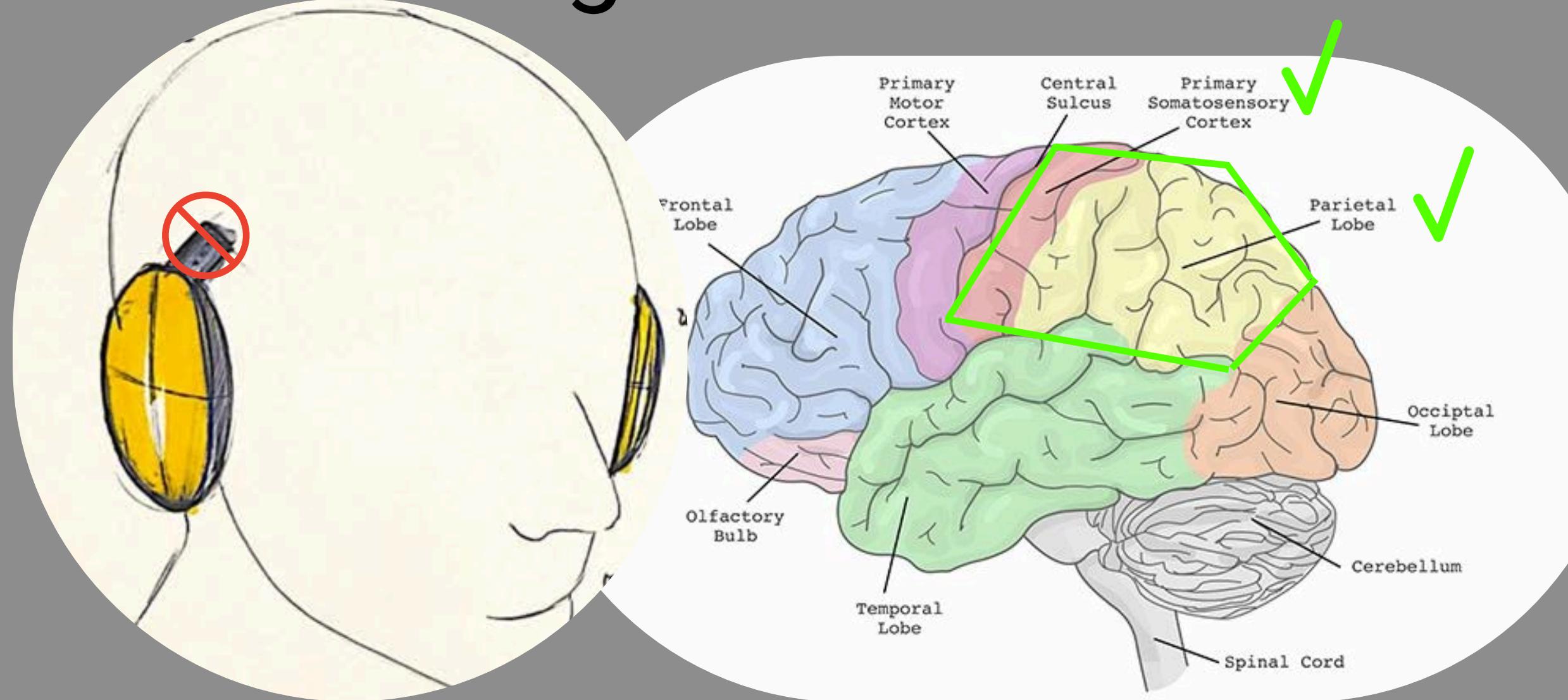
## Isma Critical feedback must change:

- *“The frontal lobe is primarily involved in regulation, attention, and decision-making not direct emotional detection. It’s important to frame its role as supporting cognitive control rather than claiming it identifies specific emotions.”*
- *“Facial cues can add important emotional context, but people can still mask expressions. Among facial features, the **eyes** are often the most telling, which is why combining them with voice data leads to more accurate affective computing.”*
- *“It’s a good idea to add airflow or some kind of temperature sensing... it could really calm the patient at that moment”*

Feedback shown in next slide...

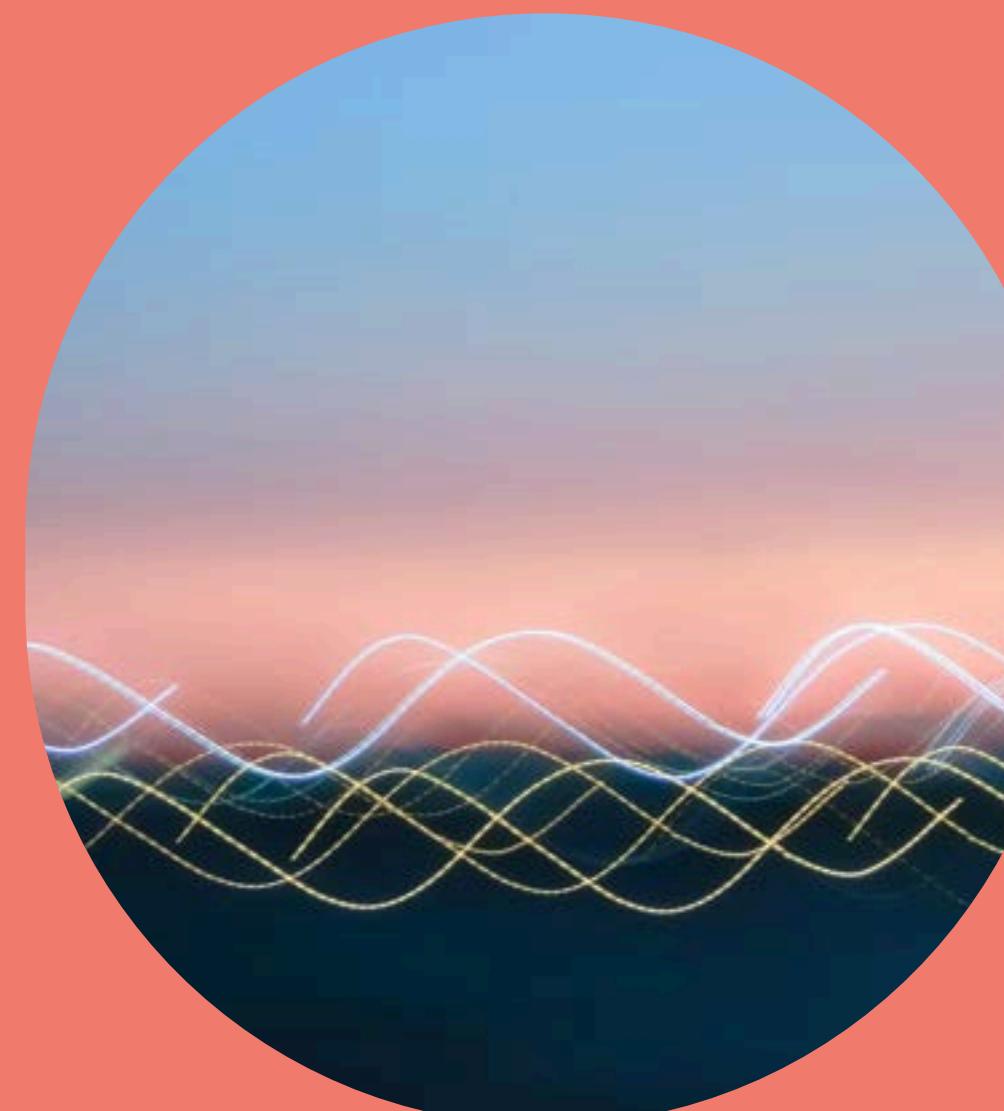
# Iterations Changes

1



Based on Isma's feedback, I adjusted the placement of the **EEG sensors**, moving them from the frontal area to the **parietal** and **somatosensory regions**. This change better aligned the sensors with areas involved in emotional processing and improved the accuracy of the readings.

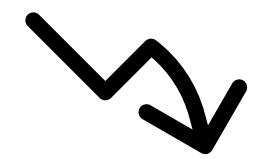
2



Through Isma's experience with patients and our conversations, it became clear that people often mask facial expressions, while the eyes tend to reveal true emotions. This insight led to combining **EEG sensing** with facial analysis, with a primary focus on eye behavior to support more accurate emotional predictions.

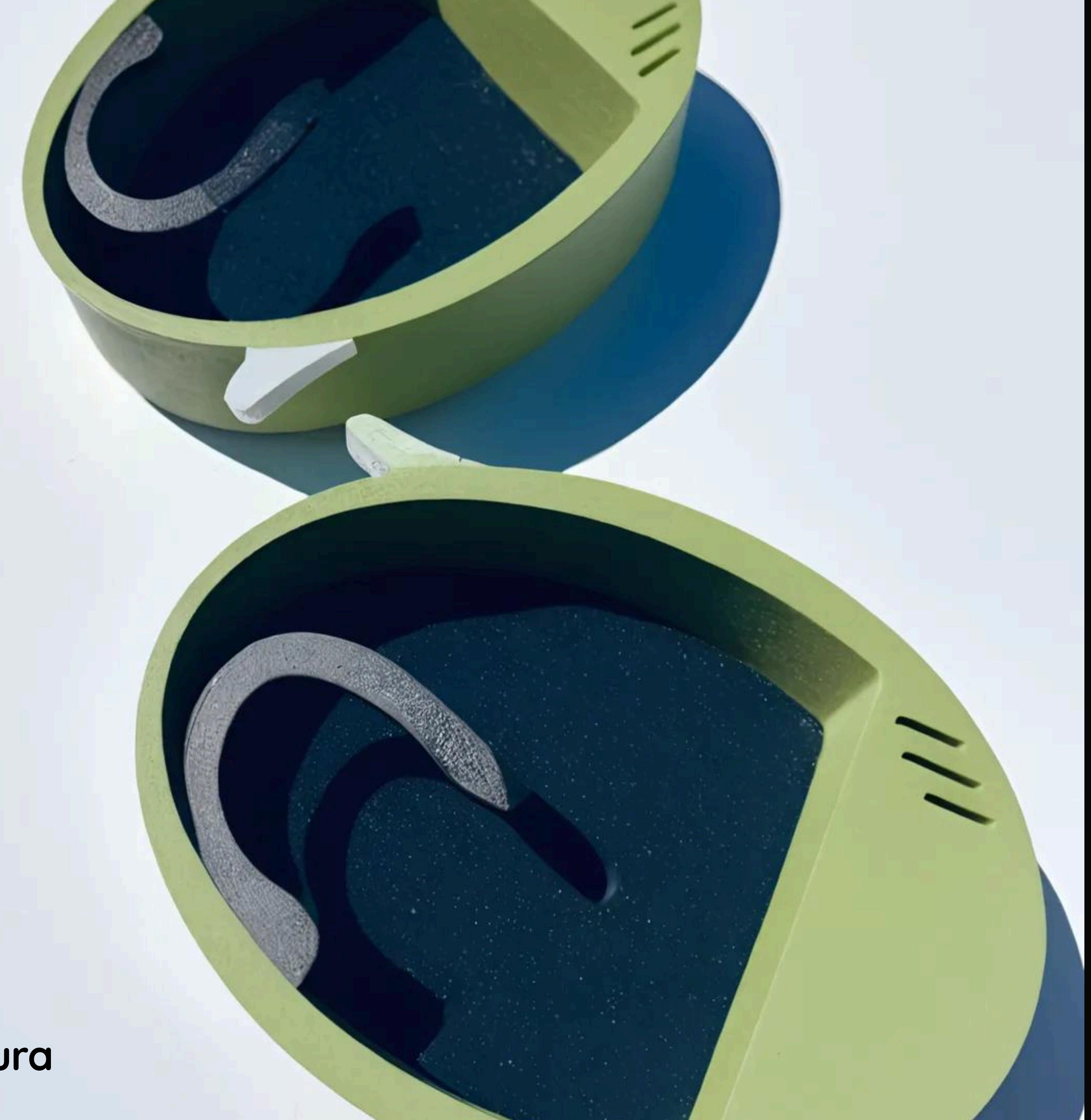
# Emotional Patterns Index: Developed from Post-Research Findings

Facial / Eye Cue	Most Likely Emotion
Tight eyelids, furrowed brows, darting eyes, rapid or irregular blinking	Anxiety or Irritation
Downturned eyelids, low blink rate, drooping gaze	Sadness or Depression
Moist or teary eyes, slower eye movement, heavy gaze	Grief or Emotional Overwhelm
Avoiding eye contact, frequent gaze aversion, fixating away from the face	Shame or Social Anxiety
Raised inner eyebrows, slightly parted lips, widened eyes	Fear or Surprise
Fixed wide-eyed stare, tense upper face, clenched jaw	Panic or Shock
Short gaze duration, fast scanning between objects or people	Restlessness or Hypervigilance



**These patterns help the system decide how to start a conversation and choose the right language or approach to support the user.**

This table outlines how facial expressions and eye movements relate to emotional states, drawing from existing studies in human behavior. It was further refined through hands-on development with input from therapist Isma. These visual cues support the AI in estimating emotional states, especially when combined with internal signals like EEG.



**MoodAura**

MoodAura features a slim ear-hook design for comfort and freedom of movement. The EEG system is built into the hook and a small piece above the ear near the parietal lobe for better emotion tracking.

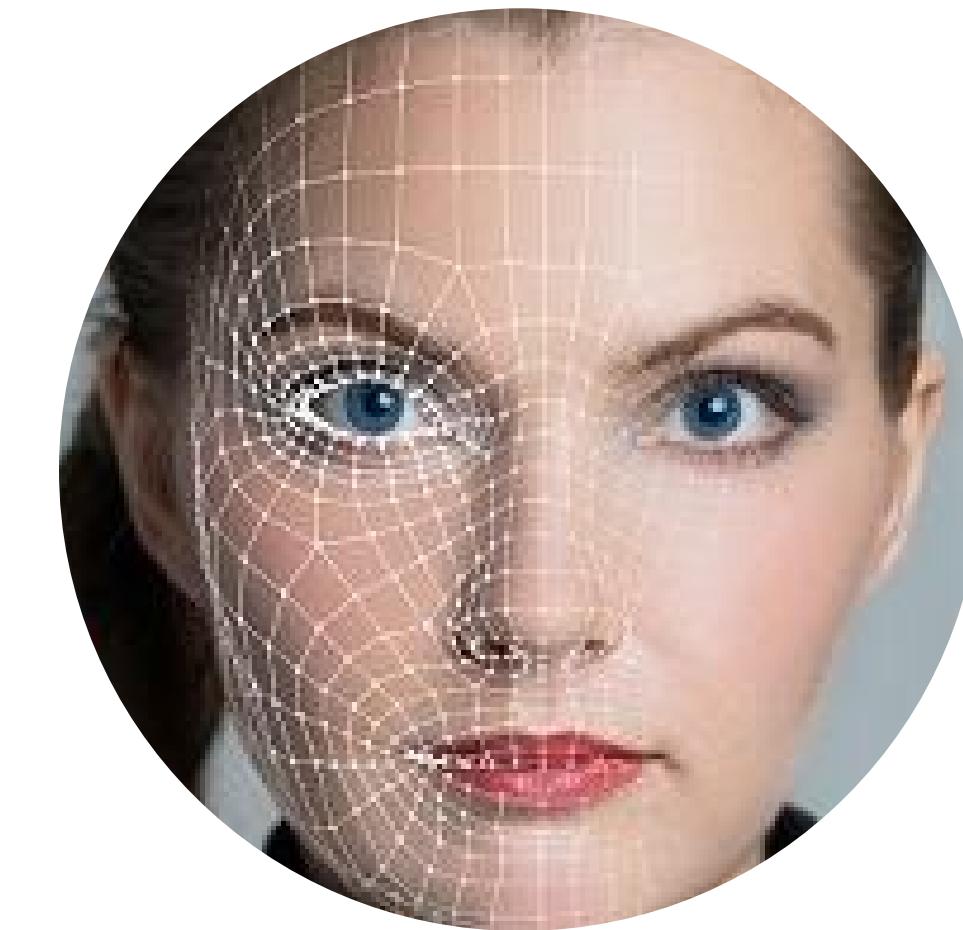
It's lightweight, minimalist, and designed for all-day comfort, blending seamlessly into your lifestyle.



MoodAura

It features a built-in **airflow** system that adjusts temperature based on your emotional state, gently blowing warm or cool air to help regulate your mood in real time.

# MoodAura



As part of its **affective computing** system, the camera scans the user's face especially the eyes, and works with voice recognition to better understand their emotions.

# Project 3

Group 3

## Industrial & Interaction designer

This project examines how interactive systems can turn complex environmental problems into approachable daily actions through clear system states, feedback loops, and community participation.

**Collaboration:** group work (App designer)

**Durations:** 4 month

**Methods:** interviews / usability test / expert feedback / prototyping

**Deliverables:** physical prototype & App



# UrchinCove

Urchin Cove: Eat Uni, Restore Kelp, Share the Future



Berkeley S

Bryan N

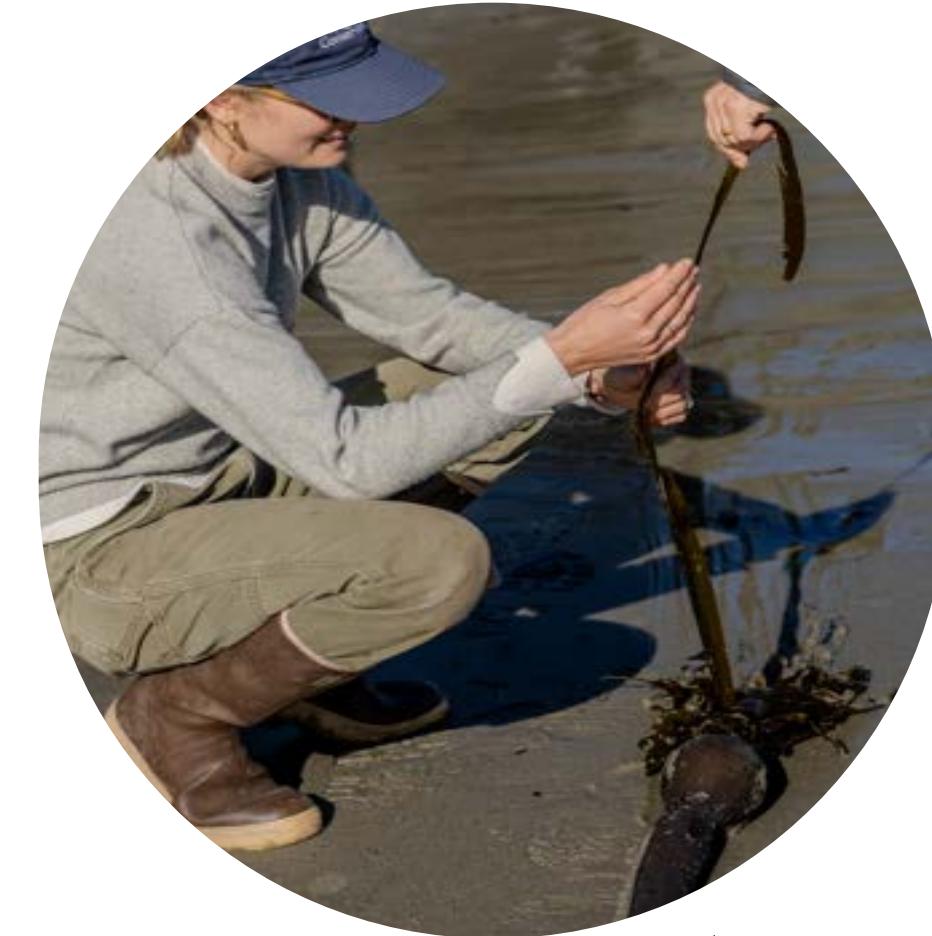
Damani T

Calvin T

# PROBLEM

The purple sea urchin population on the west coast has exploded, causing ecological imbalance and harming local economies as the urchins consume growing kelp. At the same time, there is little market or incentive for people to catch these urchins, so many are removed and wasted.

## IN-PERSON FIELD VISIT

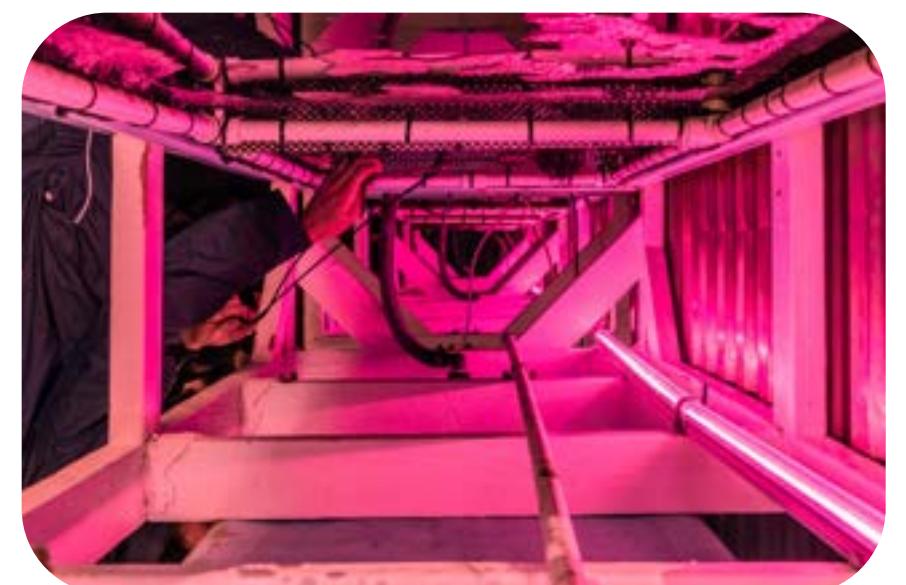


Some non-profits are restoring kelp, but efforts are limited due to low funding & community engagement

A few restaurants promote sea urchin, but awareness is low

# PROPOSITION

UrchinCove is a home urchin tank with a community app. It lets people farm urchins and share their experiences while familiarizing uni in American cuisine. At the same time, by making purple sea urchins a familiar food, we create a demand for them. This not only builds a market for the urchins but also helps fund kelp restoration efforts.



**Farming**

create a market for  
purple sea urchin



**Consume**

Reducing urchin  
overpopulation without waste



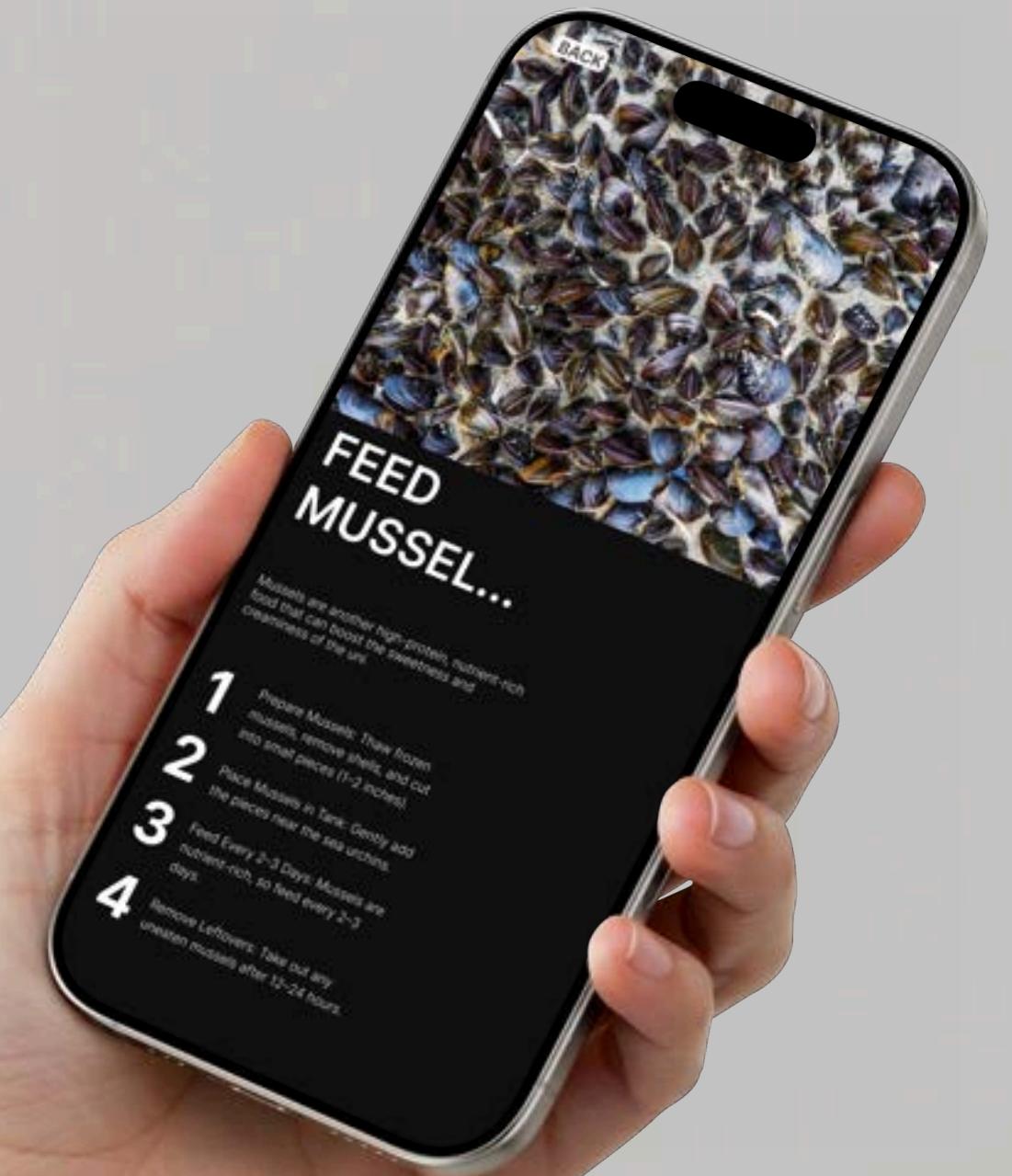
**Ecosystem restored**

connect back to the  
community enrichment

Restoring ecosystem allowing  
species eaten by urchin to come back and grow

# UrchinCove

UrchineCove brings ocean farming to you. Grow fresh sea urchin anywhere with our smart tank and connected app. Share, learn, and farm together.

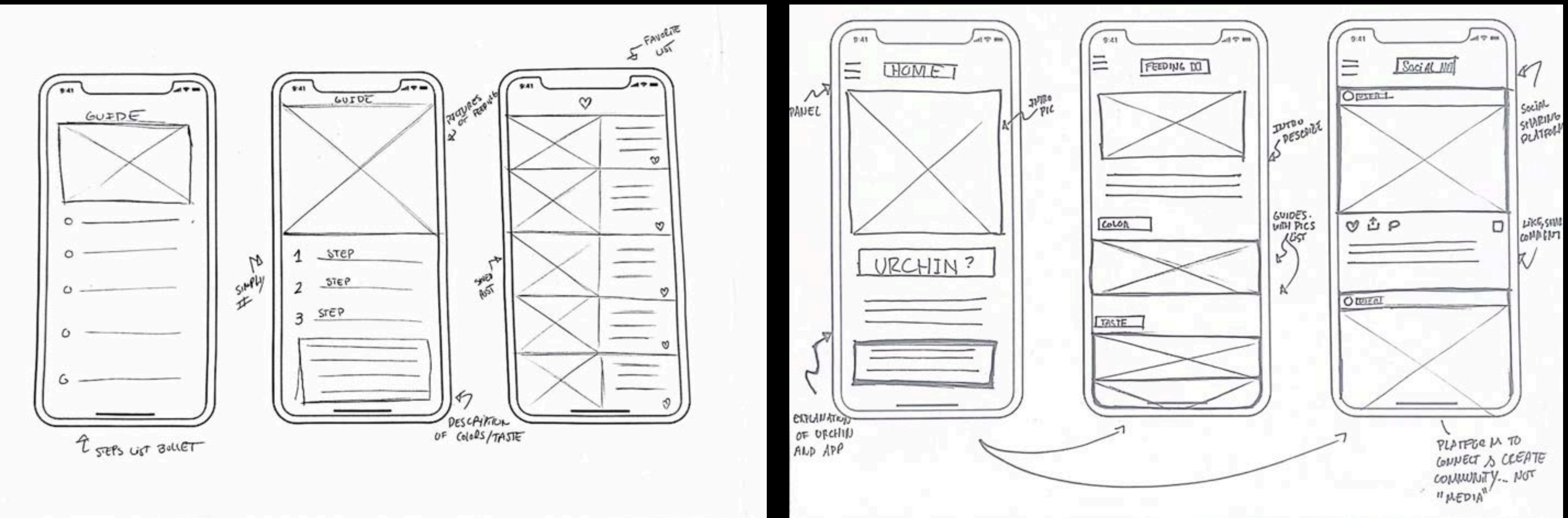
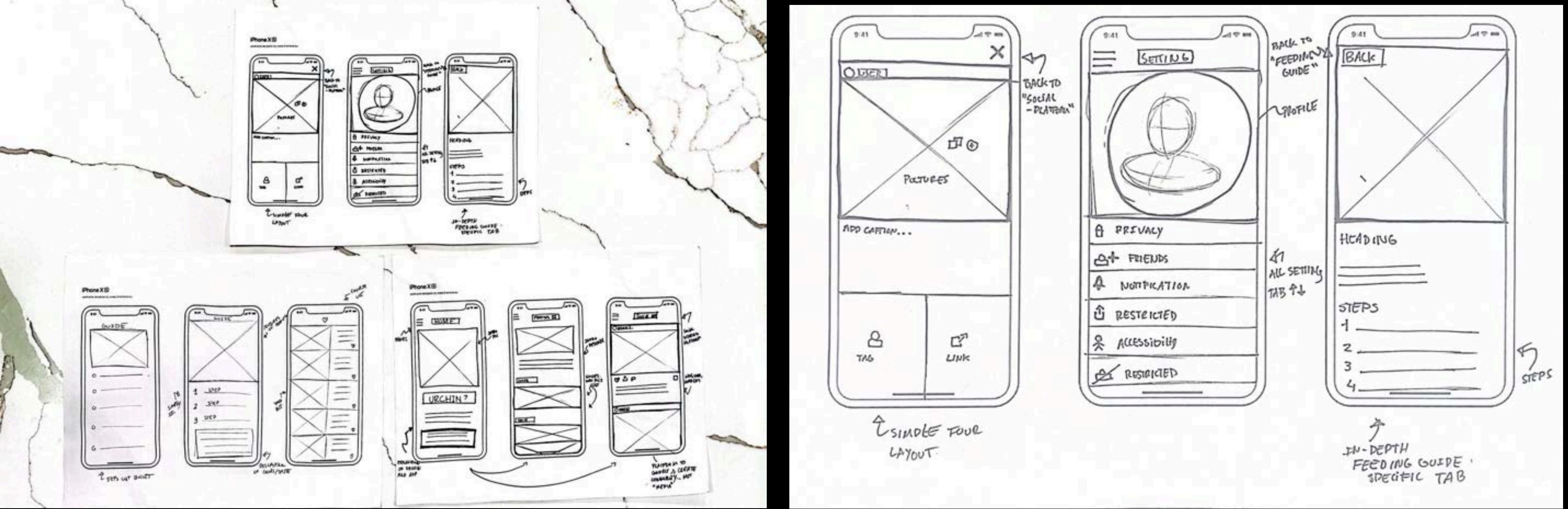


Custom Reef

Bespoke Materials base



# Low fidelity



# ENGAGEMENT LOOP & SYSTEM STATES

## **Onboarding → Daily Care → Feedback → Community → Reward & Impact**

Feedback from teammates and professors highlighted that unclear alert urgency could confuse users, reinforcing the need for simple and clearly defined system states.

Therefore, Early concept exploration revealed the need for clearer alert urgency, leading to simplified system states and more distinct labels.

### **System States redesign**

Stable — Tank conditions are healthy

Warning — Parameters are drifting and may need attention

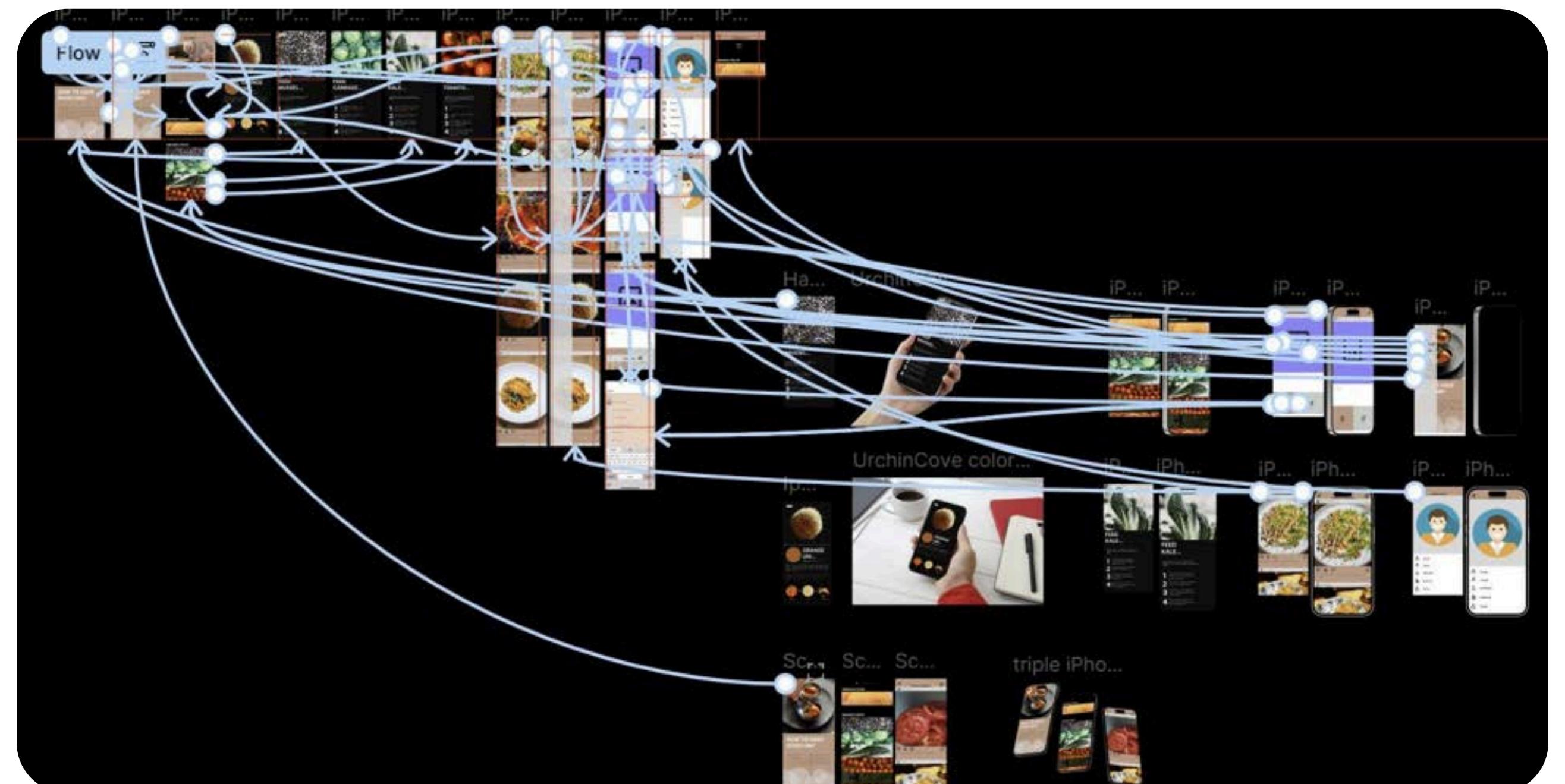
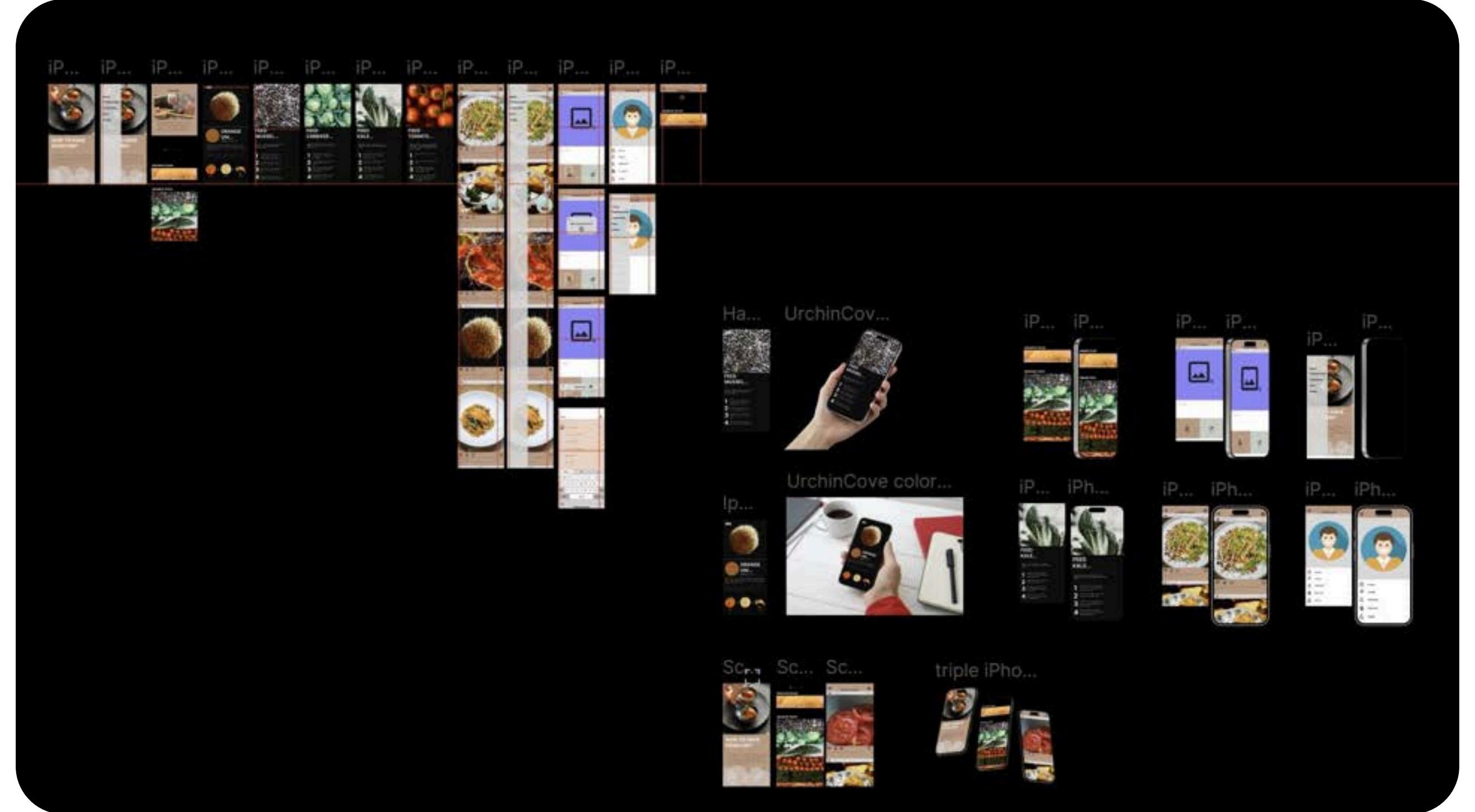
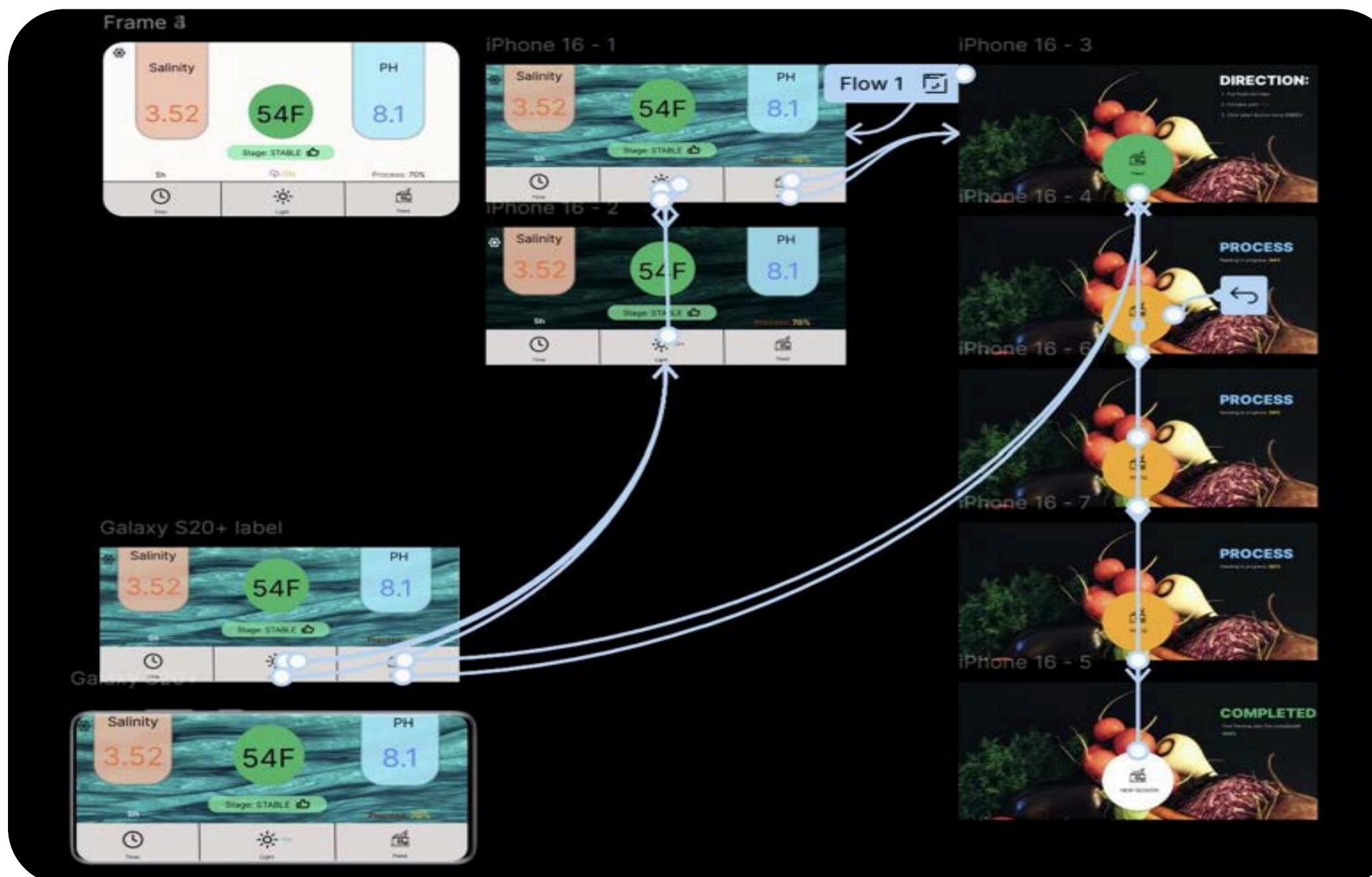
Critical — Immediate action is required

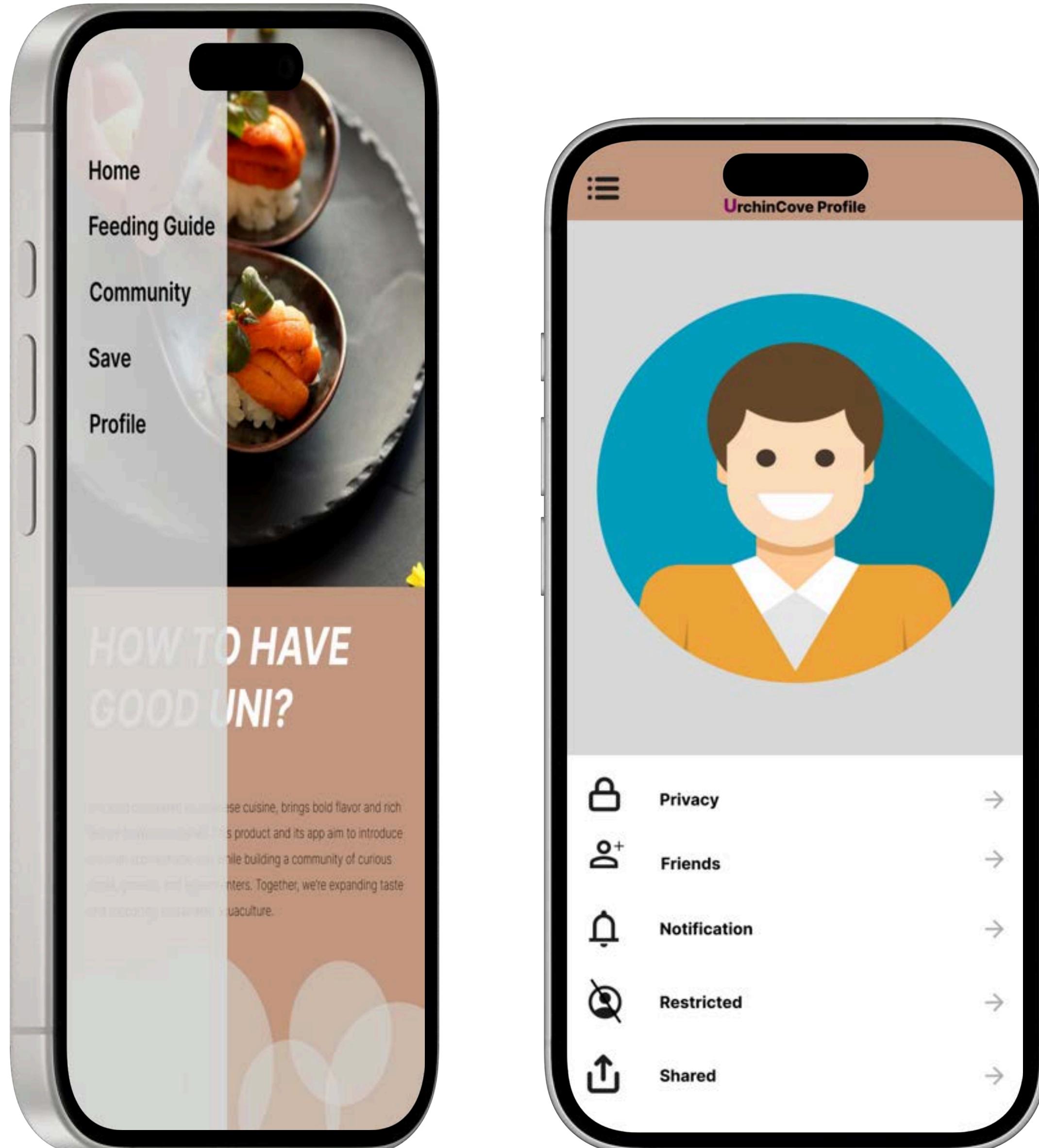
Offline — System is disconnected but remains safe

# APP DEVELOPMENT

- Developed a total of 15 mobile app screens a
- 4 primary interface screens for the product's built-in digital touchscreen
- 8 testing users recorded

focusing on clarity, usability, and seamless interaction across both platforms.



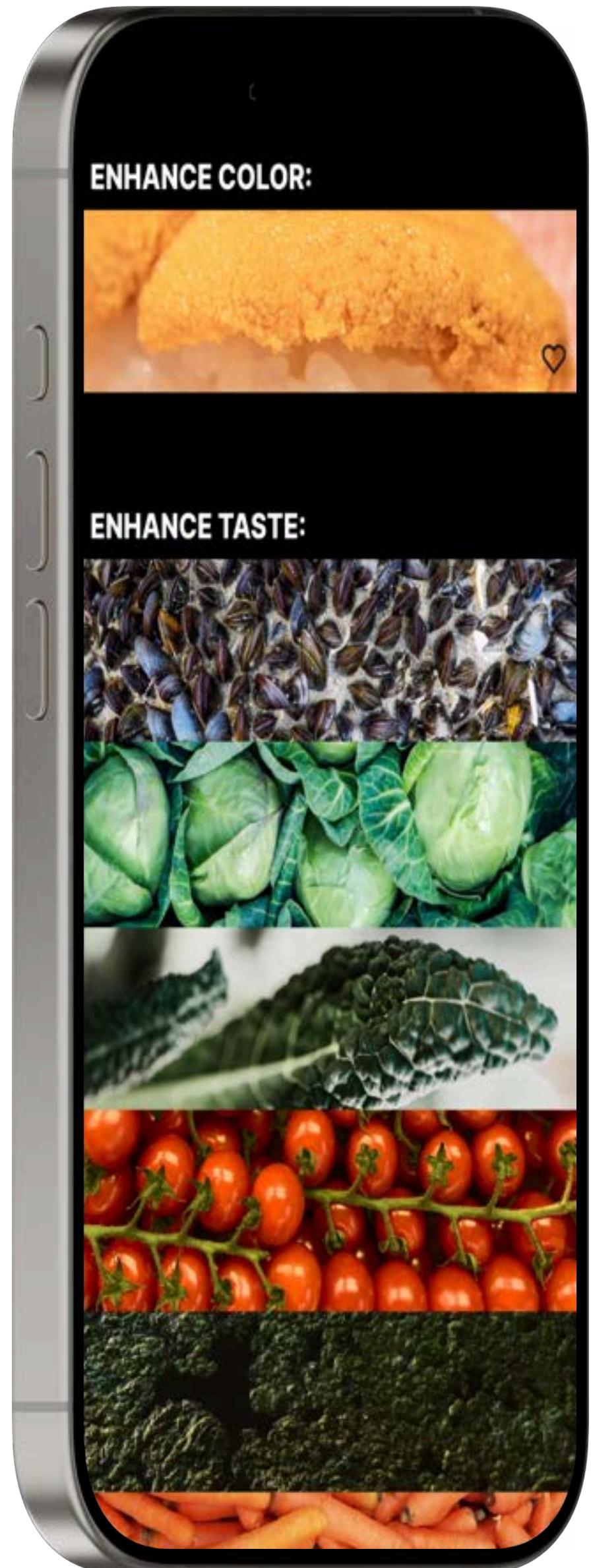


## Overview

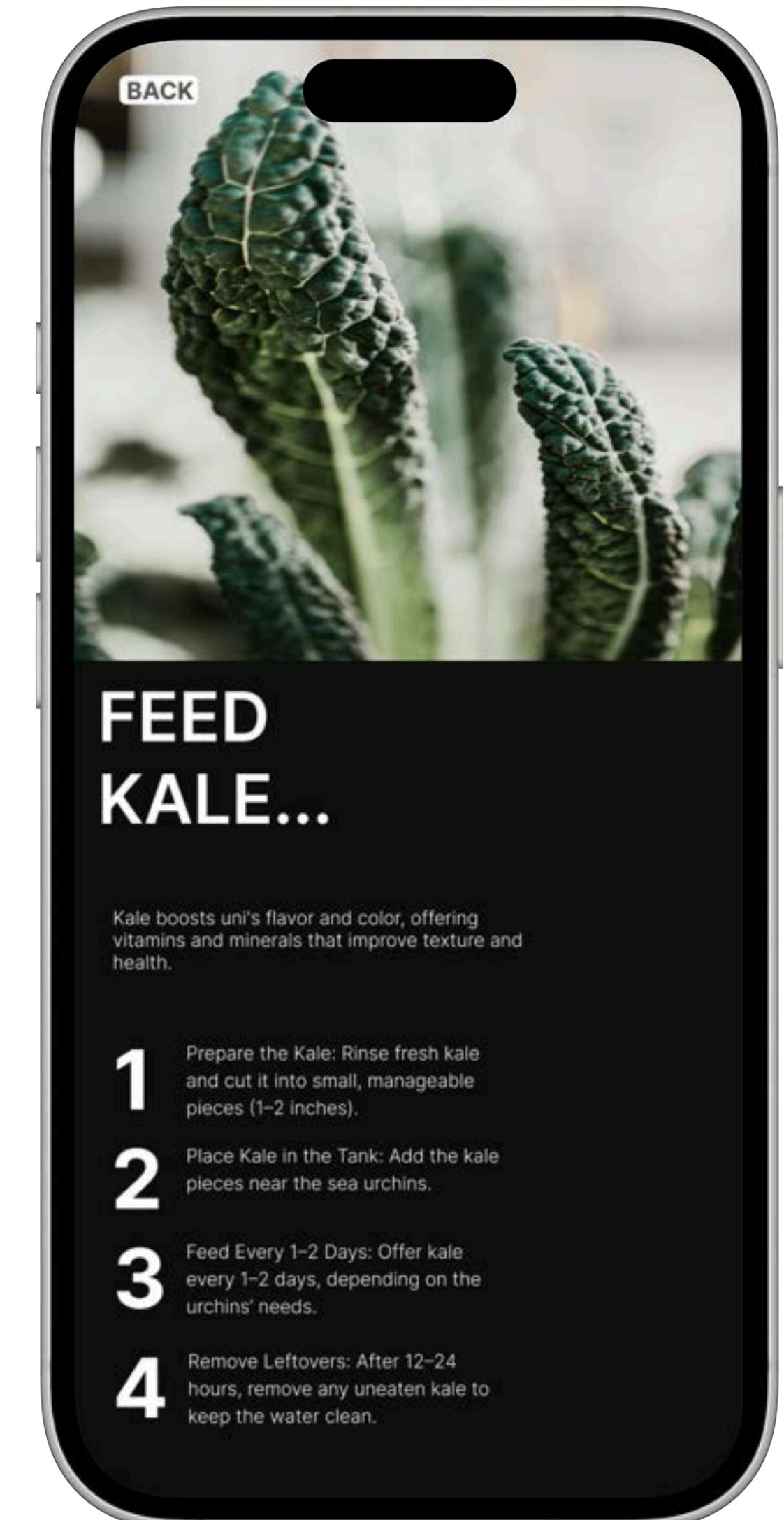
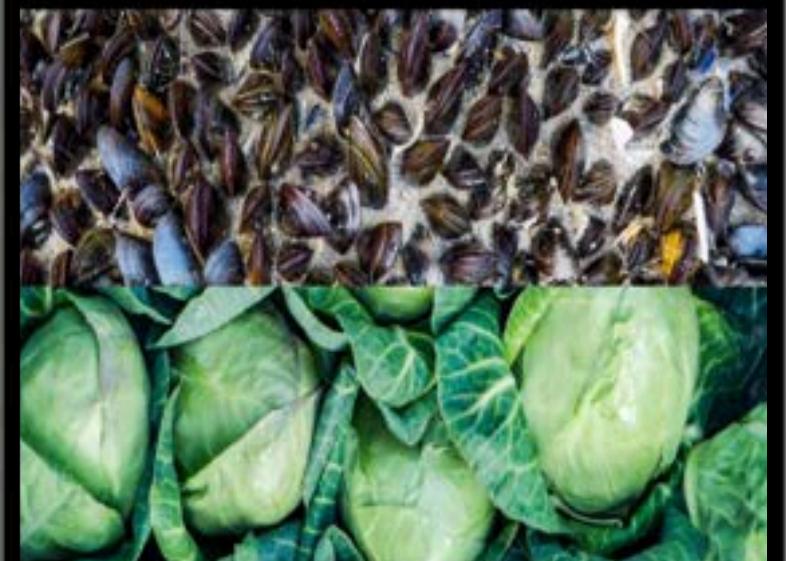
**UrchinCove** is a community-first app where people can connect, share stories, and stay updated. It includes a built-in guide, and users can create their own how-to methods to help others explore and interact.

Building meaningful connections within the UrchinCove community.

A simple and straightforward profile



ENHANCE TASTE:



## Feeding Guide

The **Feeding Guide** section offers default, custom, and saved methods to help users achieve the perfect taste or color when feeding urchins. It clearly maps out each step, making the preparation process simple and easy to follow.

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Guide showing steps how to feed urchin.



## Community

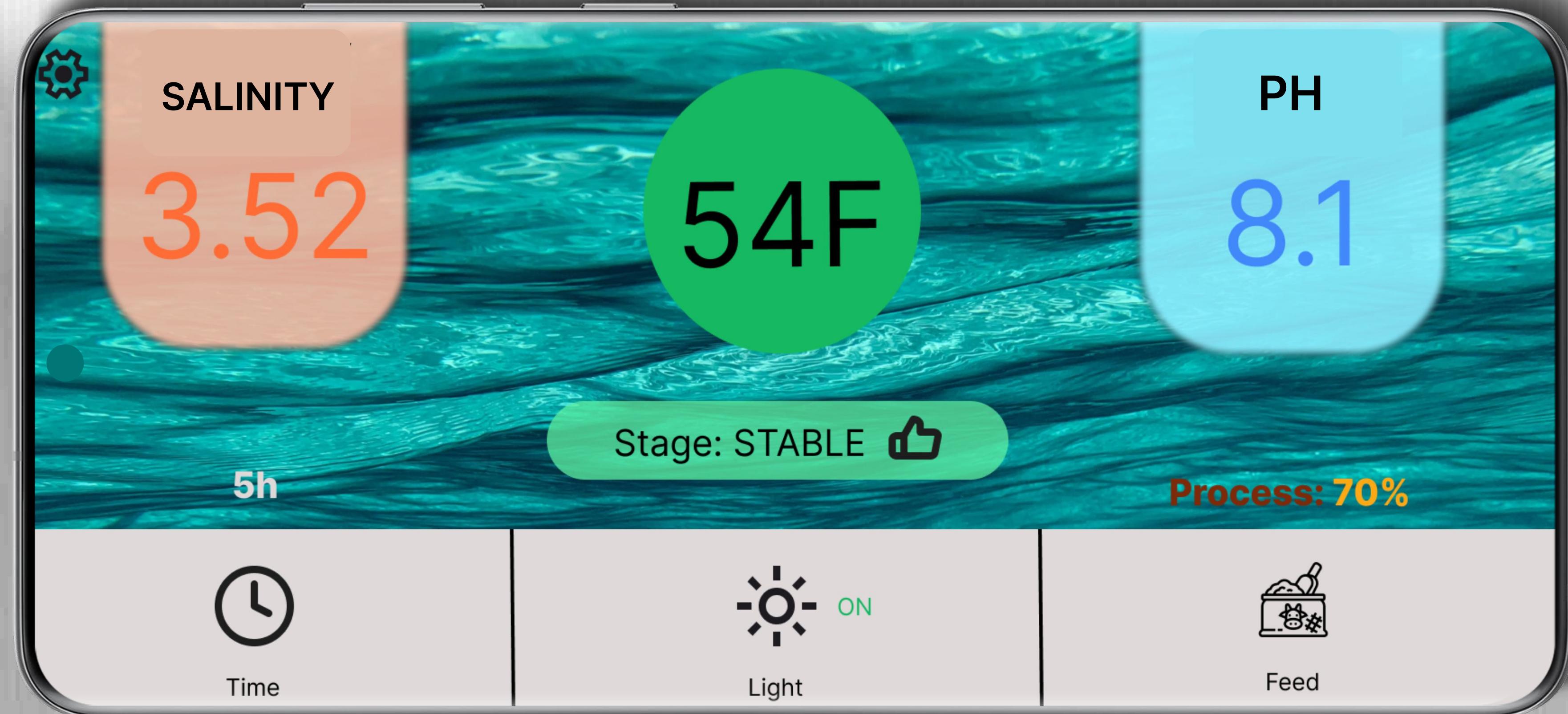
Join the UrchinCove **community** to discover, share, and save unique methods—from feeding tips to uni recipes.

Engage with others and build connections, all while exploring new ways to enjoy and interact with the urchins and the product

A mini sharing platform to connect UrchinCove

Unite users to fuel community growth and market engagement.

Important info



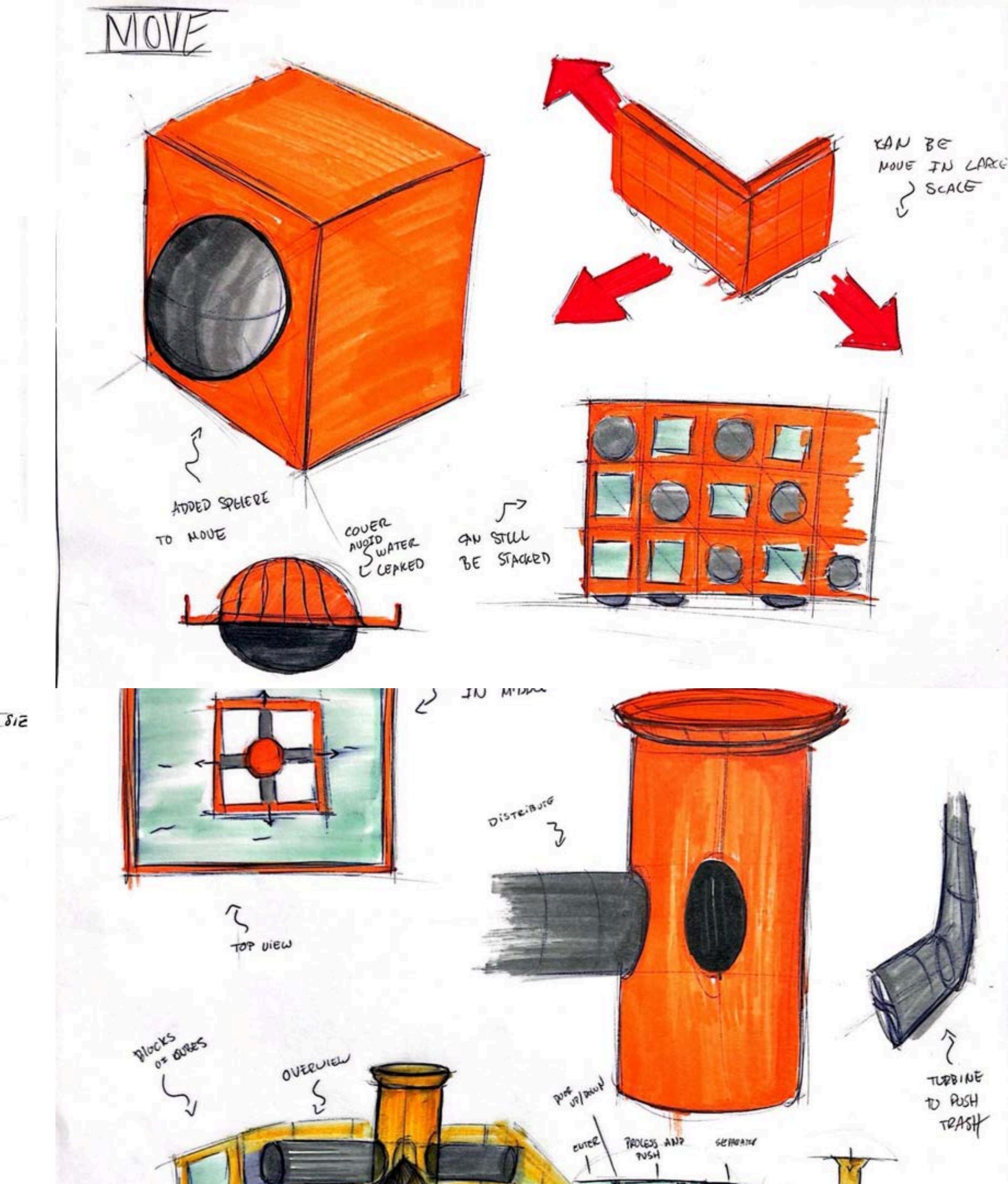
**Time** button to choose a time, and receive a reminder when it's time to feed the urchins

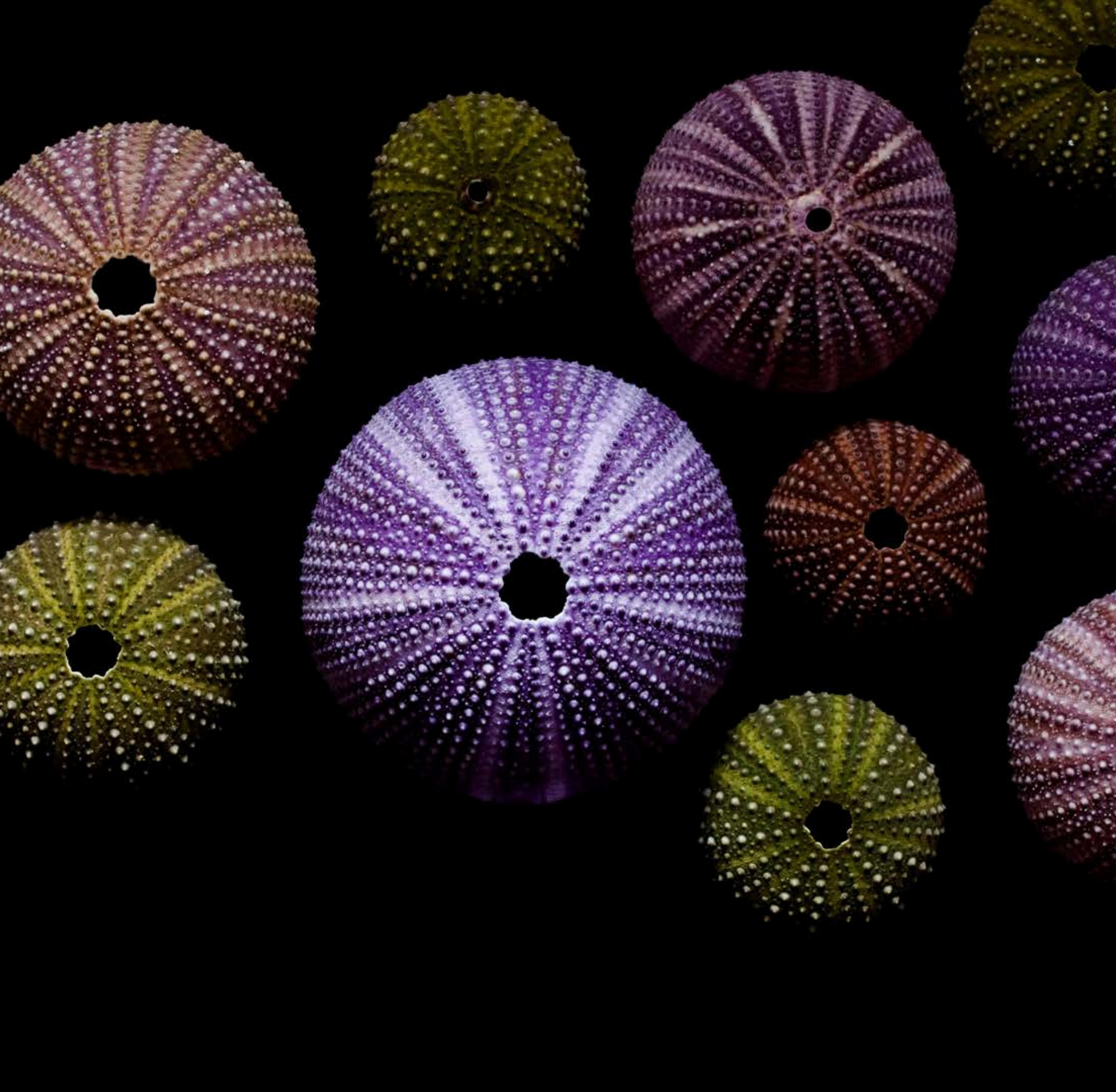
**Light** button to turn the light on or off, helping boost urchin growth

**Feed** button is to dispensing food to the urchins.

# ID process:

## IDEATION SKETCHES & ITERATION

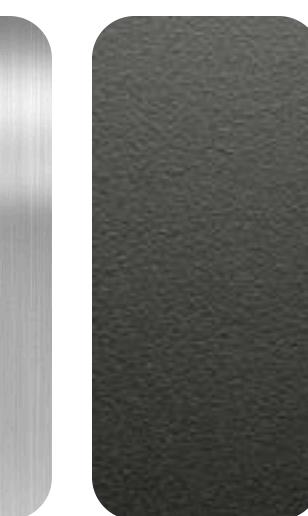




## DESIGN DIRECTION

Inspired by the gentle, rounded contours of sea urchins, the design features a minimalist and elegant form—crafted to fit harmoniously into everyday living spaces.

Clients can customize the base and coral reef elements, adding a bespoke touch that makes each piece feel personal and unique.



Materials



Coral Reef

# PROTOTYPE



- Clay was used for prototyping to capture the natural, freeform and 3D print next last few iterations.
- 3D printing and laser cutting were utilized to refine the form with precision, translating the design into a production

# UrchinCove

