

WALKIE

DESIGN 8131 Specialization Project I (2025FA)
Chris Ye, Weiching Chen, Xiaocheng Li

WALKIE is a proximity-aware social companion that detects real-world encounters and turns them into gentle opportunities for connection—whether for dating, friendship, or shared interests.

With expressive cues and lightweight sensing, **WALKIE** surfaces missed moments, eases social friction, and brings serendipitous connection back into everyday life.

Busy, fragmented urban lifestyles

Digital-first habits dominate daily communication



Face-to-face interaction becomes less natural & more intimidating



People hesitate, avoid initiating, or feel “socially blocked”



The first move never happens → real encounters fade instantly



64.2% of young adults report feeling “socially blocked” — difficulty initiating face-to-face interaction.

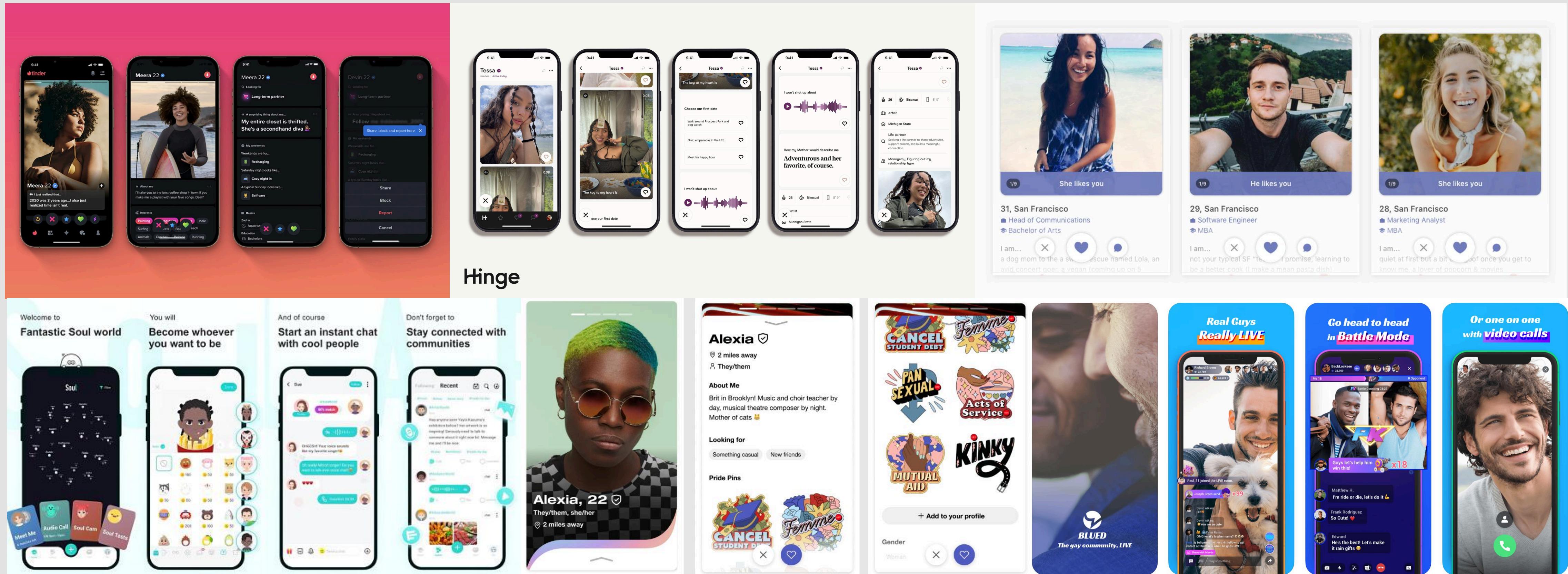


Social-media habits crowd out real-life practice, making first moves feel unnatural.



Face-to-face moments offer higher emotional reward, yet people still hesitate to start.

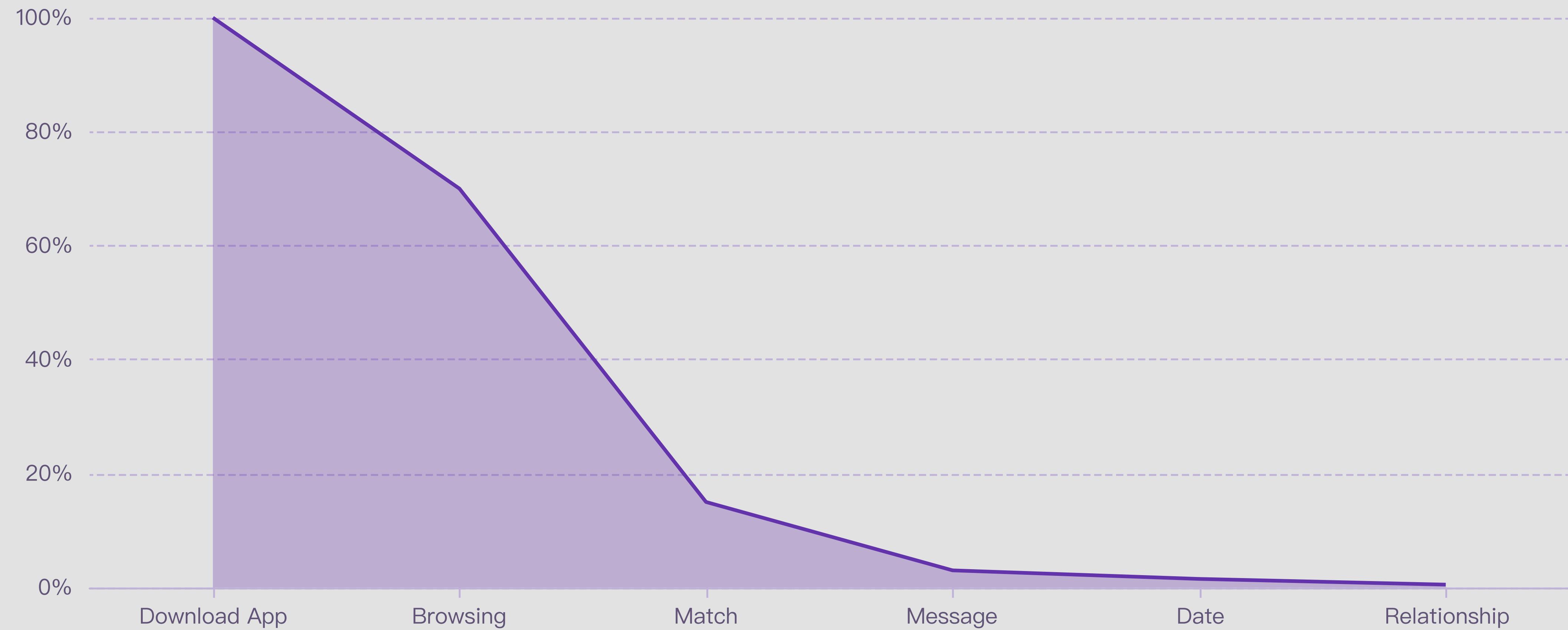
Market Research



Most dating apps focus on building connections online first, often leading to shallow conversations and a lack of real chemistry when people finally meet. This creates a gap between digital interaction and genuine in-person connection.

Market Research

Dating App Funnel Drop-off Curve



Swiping apps generate millions of matches, but very few lead to real interaction

Source

Business of Apps.
Dating App Benchmarks.
<https://www.businessofapps.com/data/dating-app-benchmarks/>

Fiore, T. A., et al.
"Who Wants to Marry a Giant Robot? Matchmaking on Online Dating Platforms."
arXiv preprint arXiv:1607.03320.

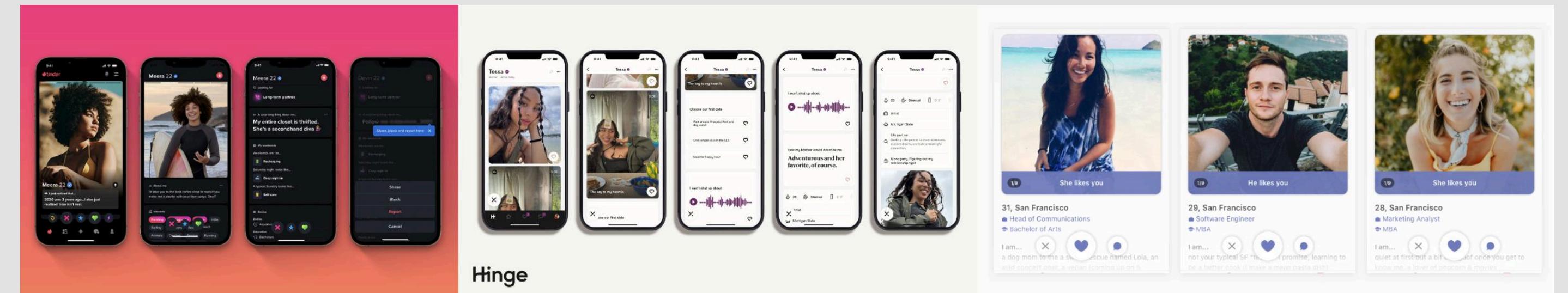
Reddit – r/OnlineDating.
"Guys, What Is Your Match-to-Date Conversion Ratio?"
https://www.reddit.com/r/OnlineDating/comments/vxtc9i/guys_what_is_your_match_to_date_conversion_ratio/

SwipeStats.
Tinder Statistics and Match Rate Analysis.
<https://www.swipestats.io/blog/tinder-statistics>

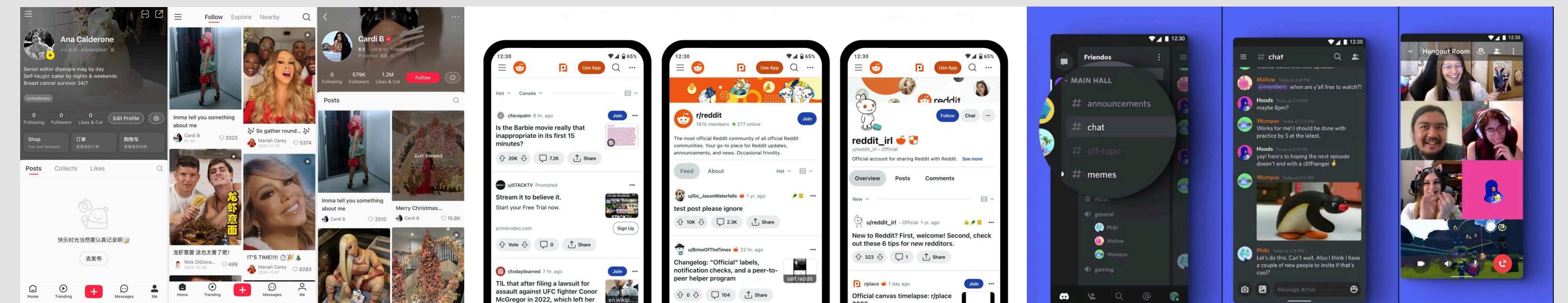
Reddit – r/hingeapp.
"What's a Good Match-to-Date Conversion Rate?"
https://www.reddit.com/r/hingeapp/comments/zy4mqq/whats_a_good_match_to_date_conversion_rate/

Social Approaches Analysis

DATING & SOCIAL APPS



FORUMS & COMMUNITY PLATFORMS



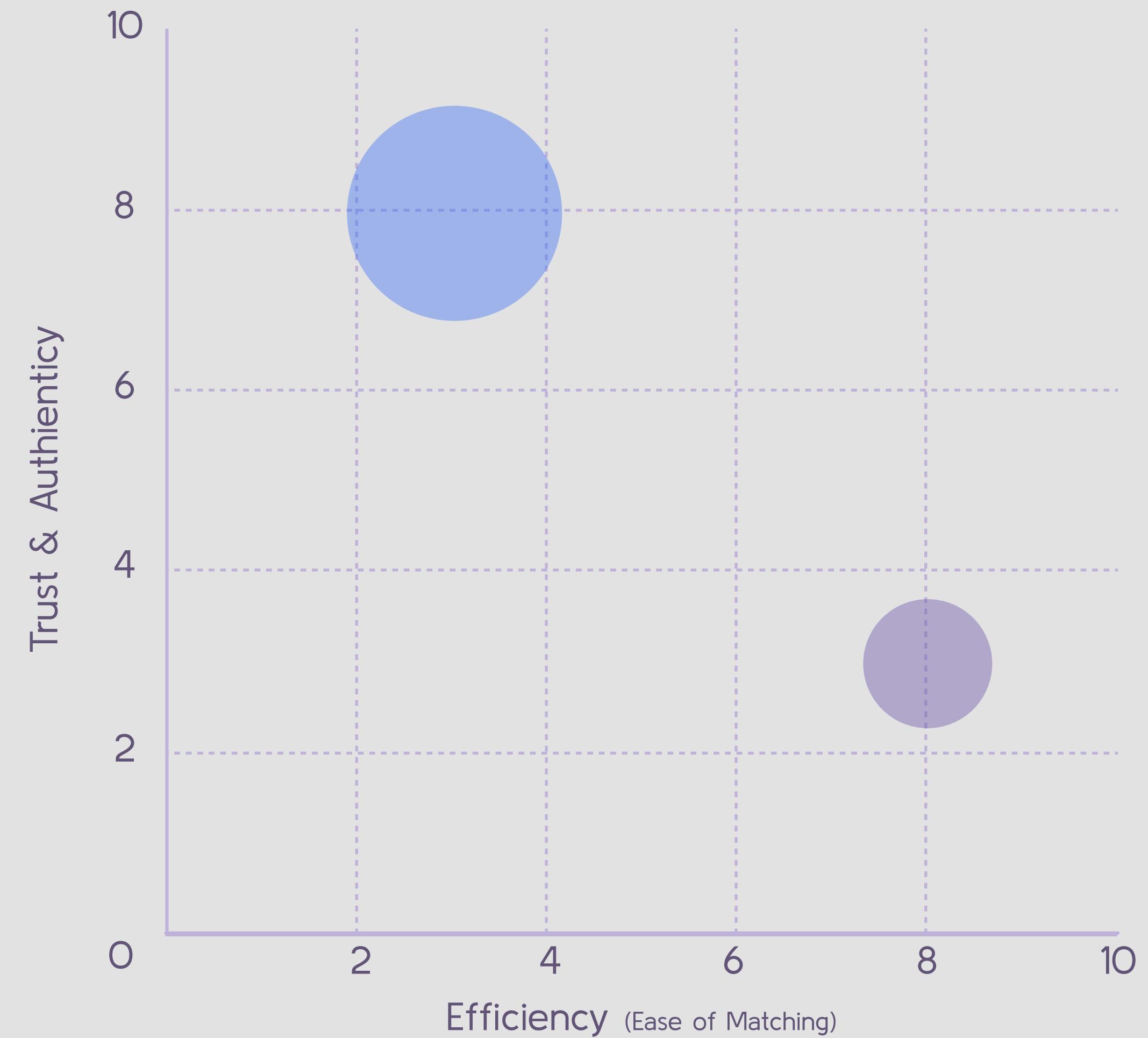
ONLINE GAME



OFFLINE SOCIAL



Social Approaches Analysis



Digital platforms maximize efficiency but struggle with authenticity and offline outcomes.

Offline approaches foster high trust and deeper bonds but are limited in scale and speed.

Size of Bubble = Depth of Relationships
■ Offline Social Activity ■ Digital Platform

Hybrid Model Case Study: Lets Movie



PROS

Reduced awkwardness with shared context

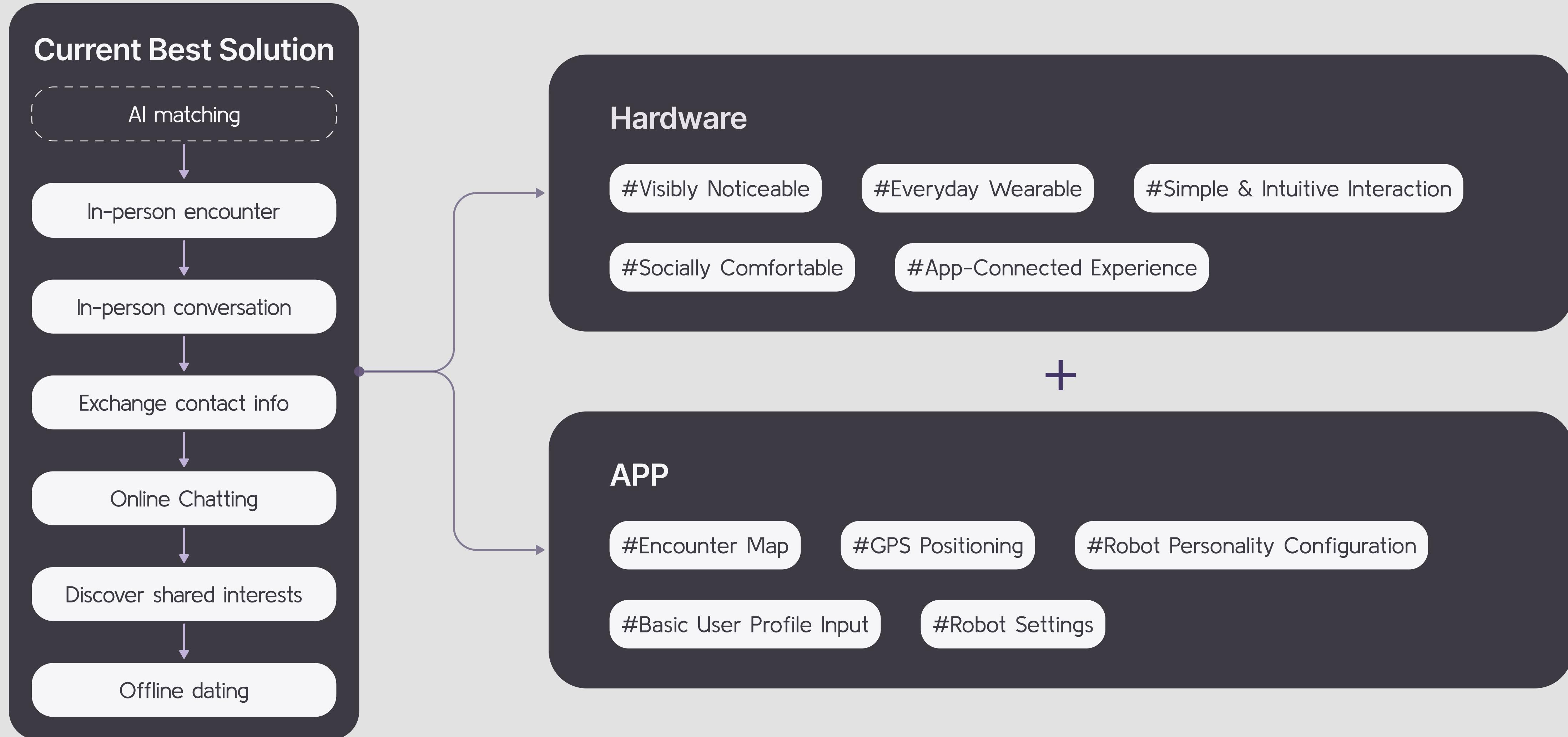
CONS

Users lacked choice, control, and trust.

Aspect	Strengths	Weaknesses / Reasons for Failure
Concept	Hybrid of digital and physical; encourages meeting in person first	Relies on AI-driven matching rather than user choice
Social Context	Movies provide a built-in shared topic; easier to break the ice	Users can't fully control who they meet, reducing agency
User Experience	Lowers awkwardness by offering common ground	Lower sense of safety and satisfaction; trust issues remain

How might we design a product that encourages people to meet and connect in person from the very beginning, helping them build authentic relationships right away?

Design Goal



Ideal Experience



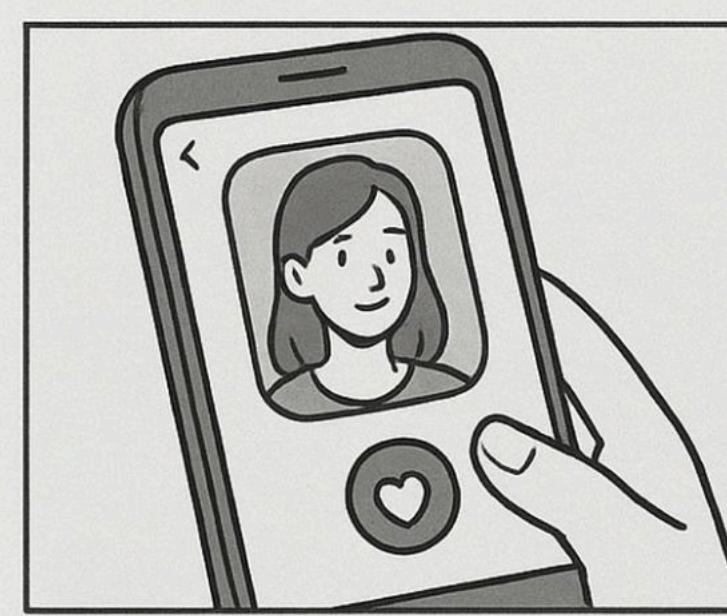
USER 1 WALKS DOWN STREET,
DETECTS USER 2 ALERT



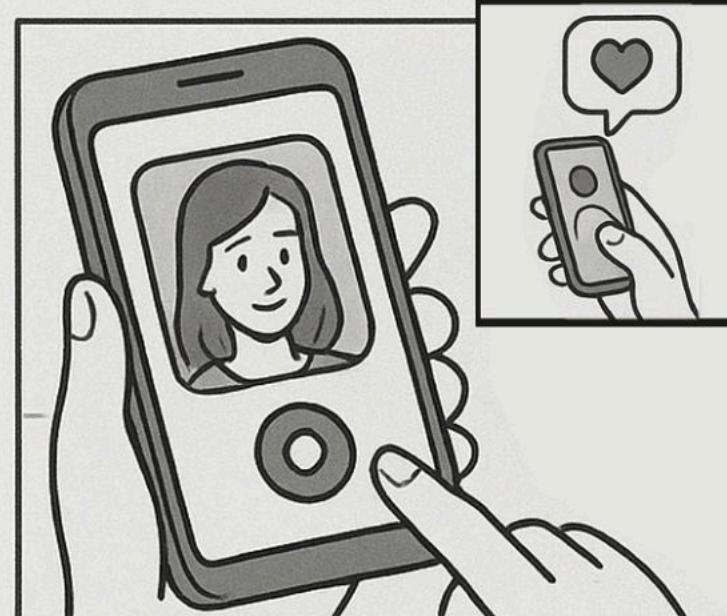
USER 1 IS BUSY, GLANCES
AT USER 2 FROM AFAR



USER 1 OPENS APP AT HOME,
CHECKS ROUTE AND



USER 1 TAPS USER 2'S
PROFILE TO RECALL



USERS GIVE EACH OTHER A
LIKE AND MATCH AT HOME



USERS EXCHANGE
EXTERNAL CONTACT AND CHAT

Missing A Good Match



1. DETECTION



BUSY DAY



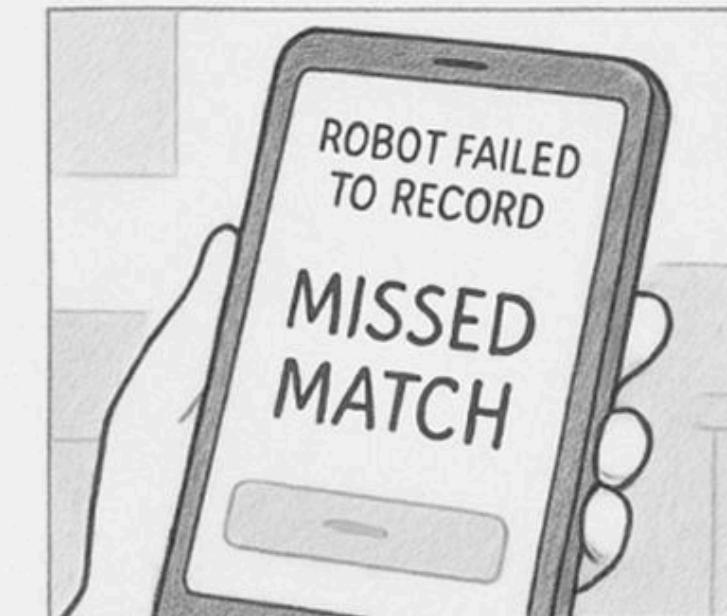
3. OPEN APP



NO PROFILE



5. REPORT PROBLEM



MISSSED MATCH

Negative Externalities



Robot loudly announces match info in public



Everyone turns to look; user freezes.



Robot tries to "help" by projecting a heart animation or voice, worsening the scene.



The other person feels offended or uncomfortable.



User tries to stop the robot, but it keeps making noise



User runs away, people filming with phones



Robots

Can convey social signals through expressions, gestures, and sounds, serving as icebreakers or companions.

PROS

Anthropomorphic, adaptive, able to build emotional bonds

CONS

High cost, larger size, and potential acceptance/privacy concerns.



Wearable

Can transmit social signals through light, vibration, or temperature

PROS

Lightweight; Discreet; High user acceptance

CONS

Limited interactivity; Difficult to actively engage



Mixed Reality Devices

Overlay digital information onto the physical environment



PROS

Rich information layer, directly bridges the virtual and real worlds.

CONS

Bulky, privacy concerns, limited real-world usability.



Ambient Devices

Coffee cups, desk lamps, chairs, etc., that reflect social status through color or light changes.

PROS

Non-intrusive, creates an atmospheric effect.

CONS

Location-dependent, not portable.



Physical Charms

Can serve as a "social pet" or icebreaker, linking online matches with offline interaction.

PROS

Cute appearance, portable, easily sparks goodwill.

CONS

Fixed behaviors, difficult to adapt dynamically to social contexts.



Robotic Keychain

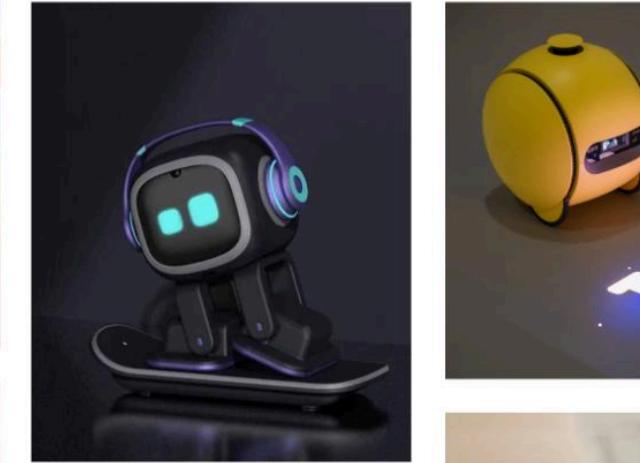
Doll



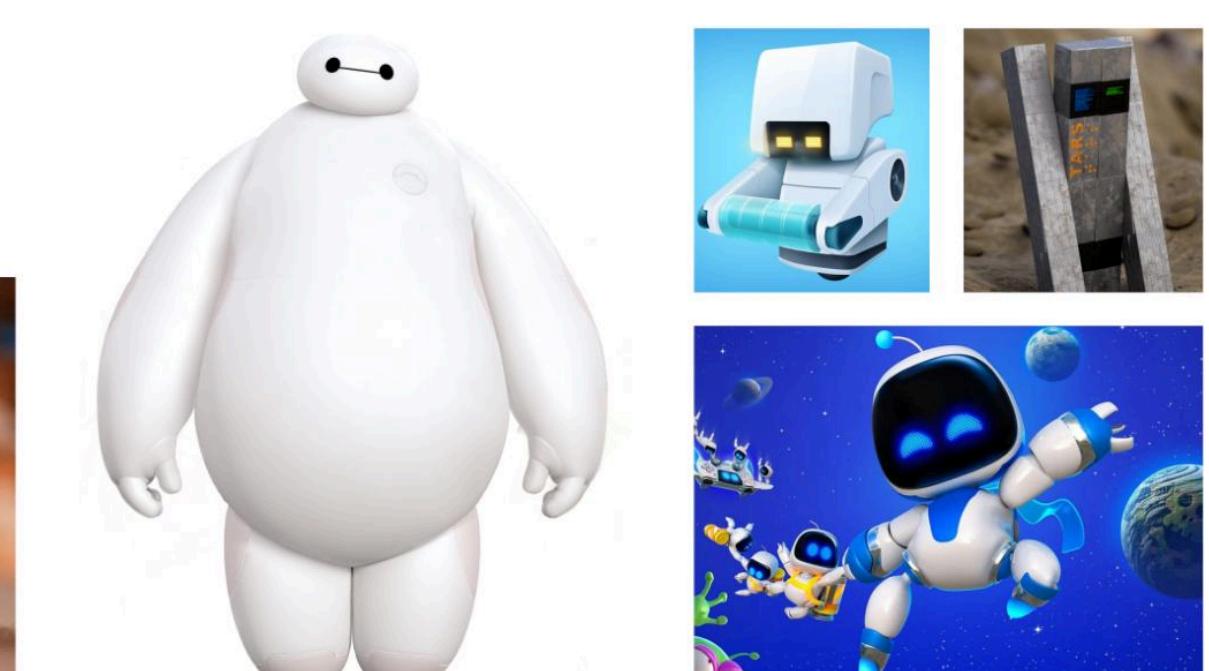
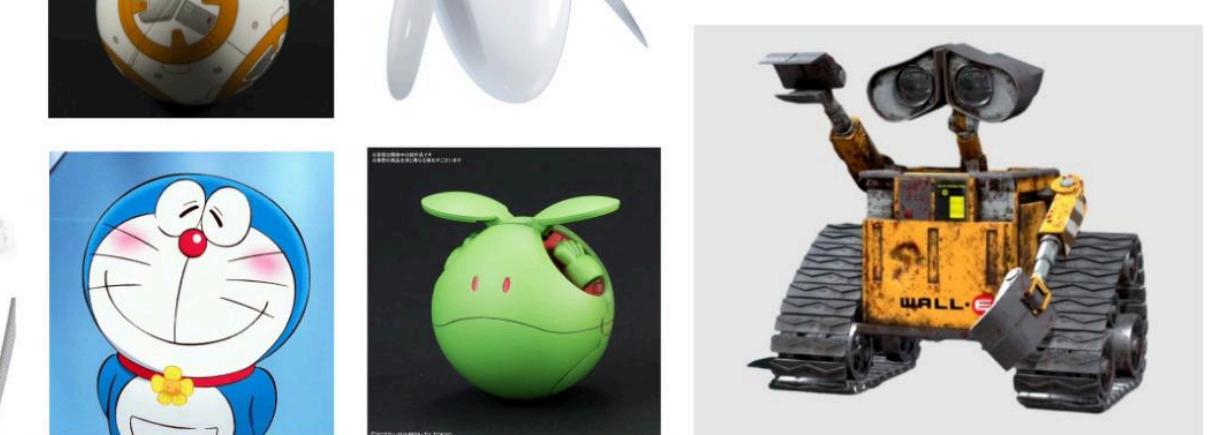
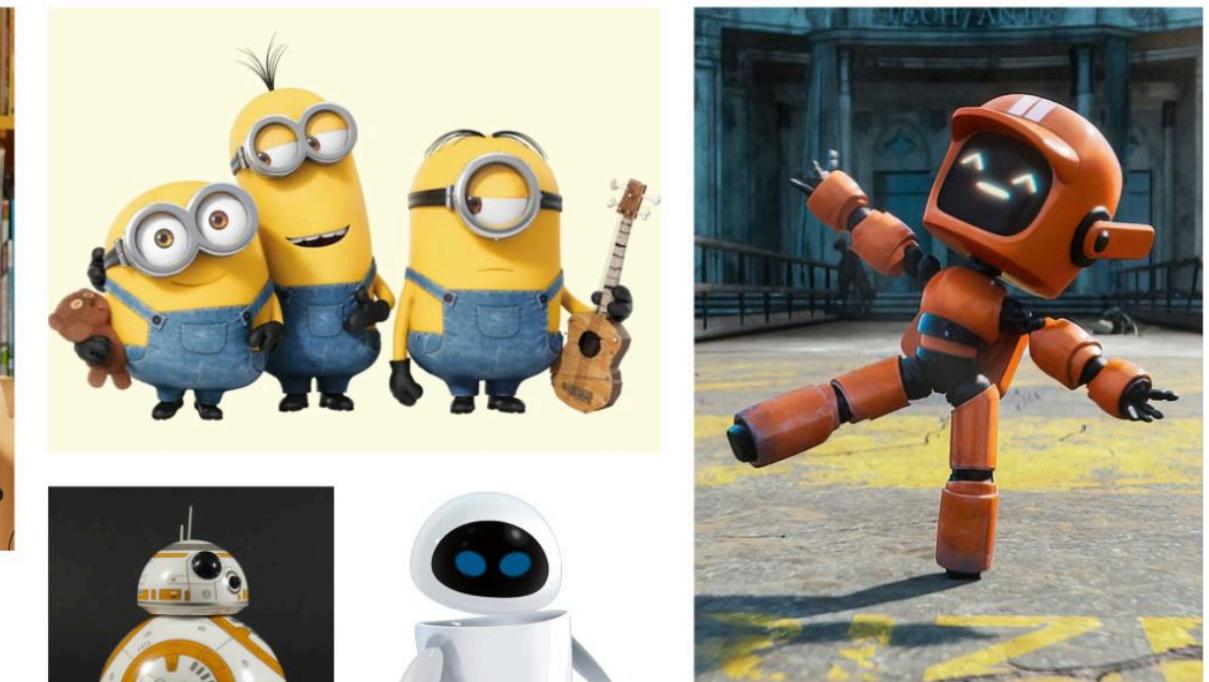
Wearable hardware



Intelligent Robot



Movie Robot Characters





WALKIE



#Compact Everyday Wearable Form

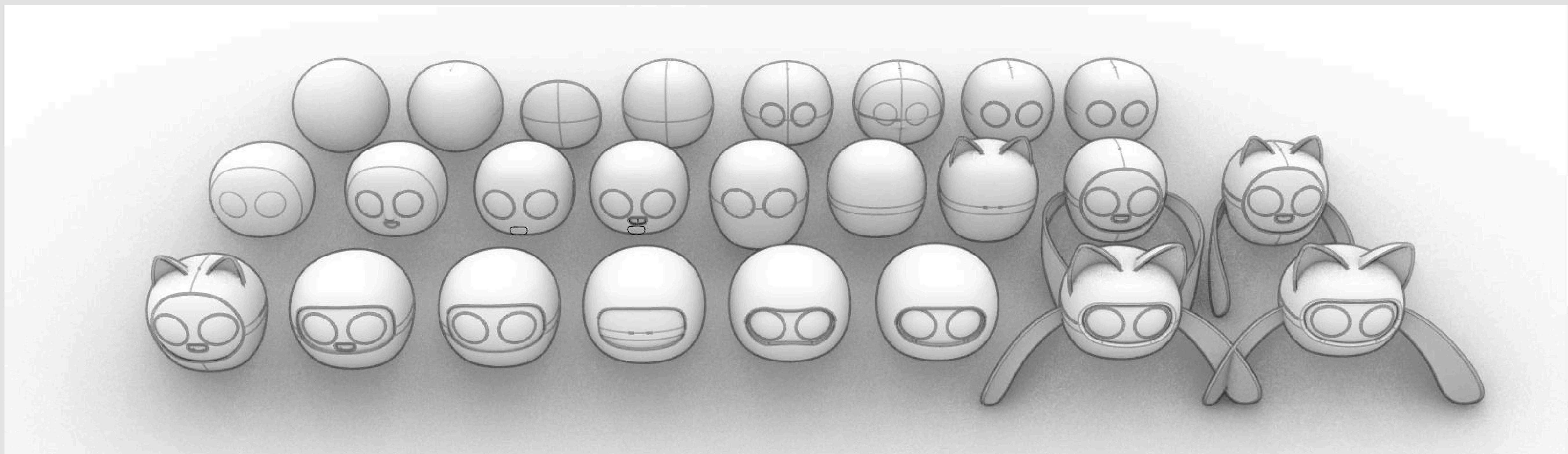
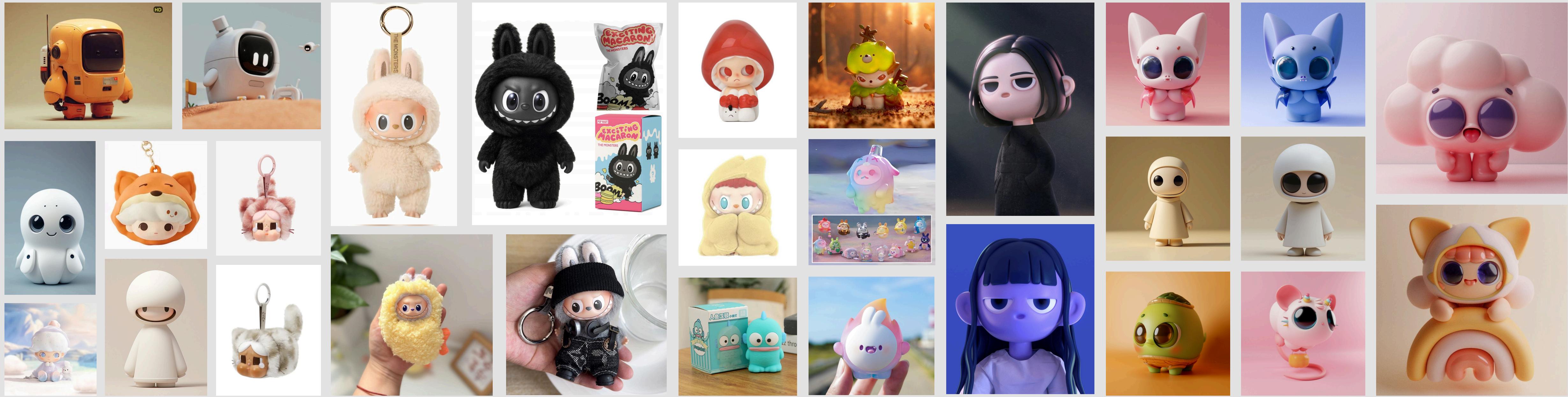
#BLE + GPS Hybrid Sensing

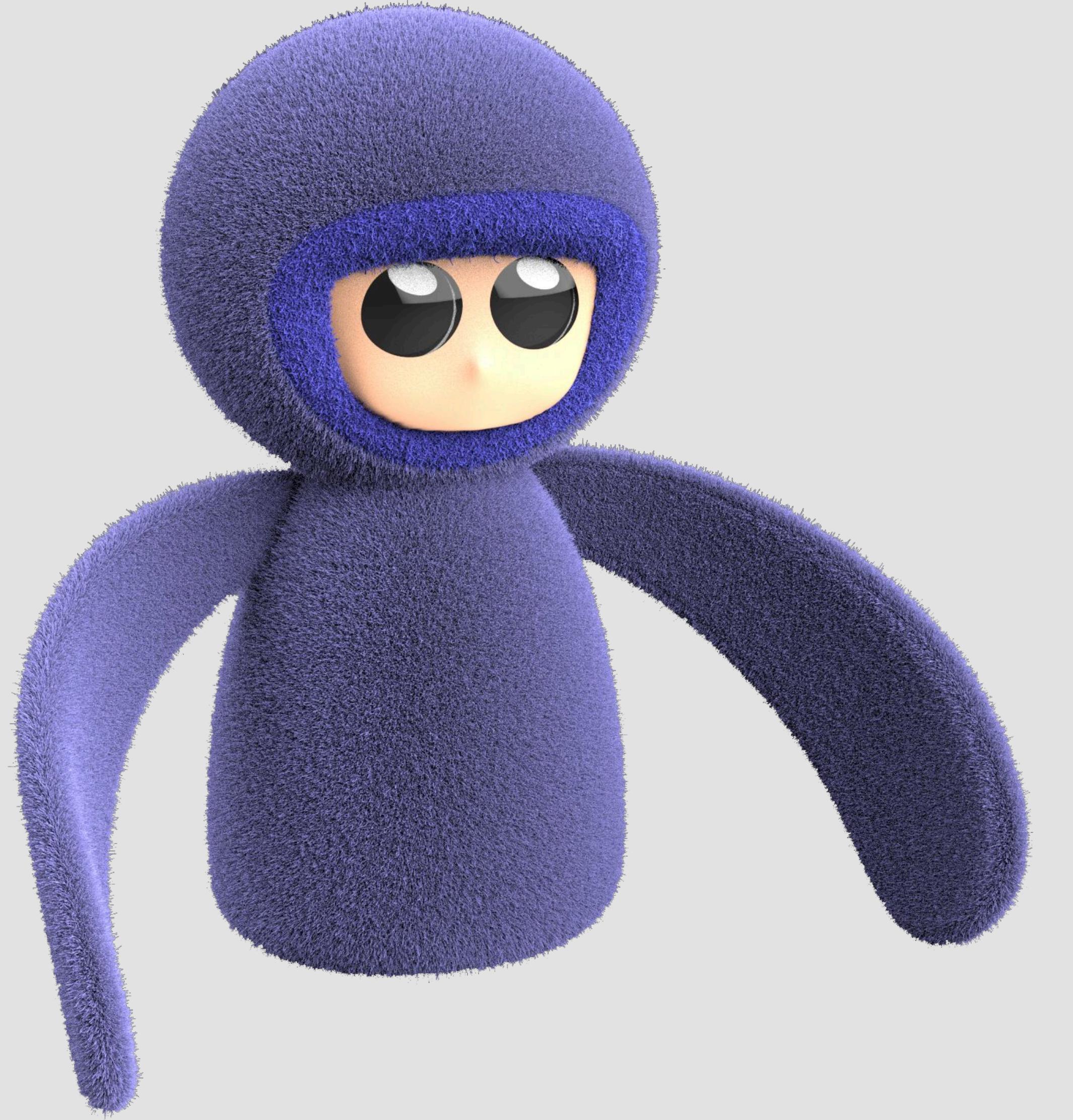
#Magnet-Embedded Small Arms (Interaction Cues)

#Lightweight, Portable Build

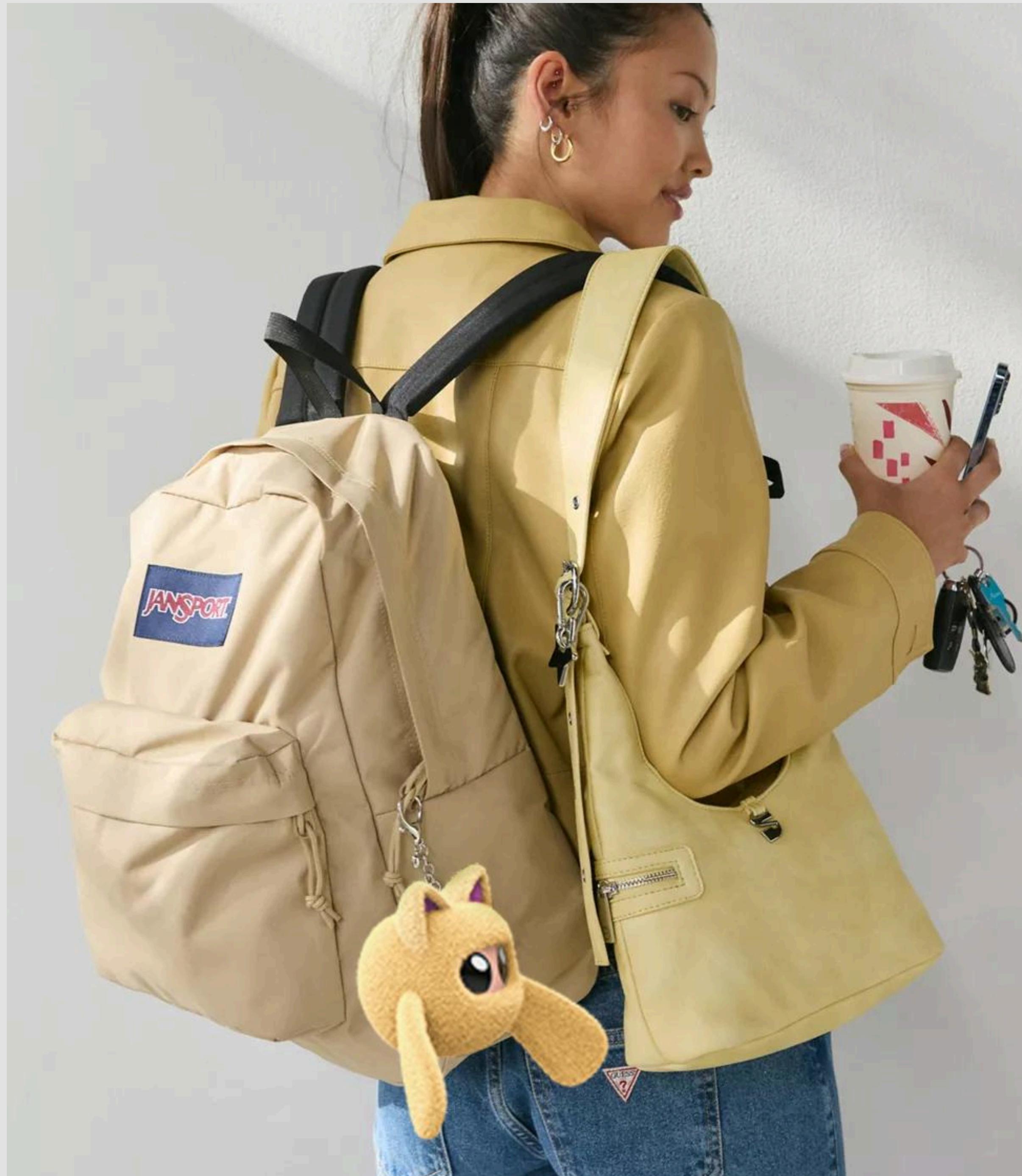
#LED/E-ink Expressive Eyes

#Soft Plush Shell with Replaceable Covers



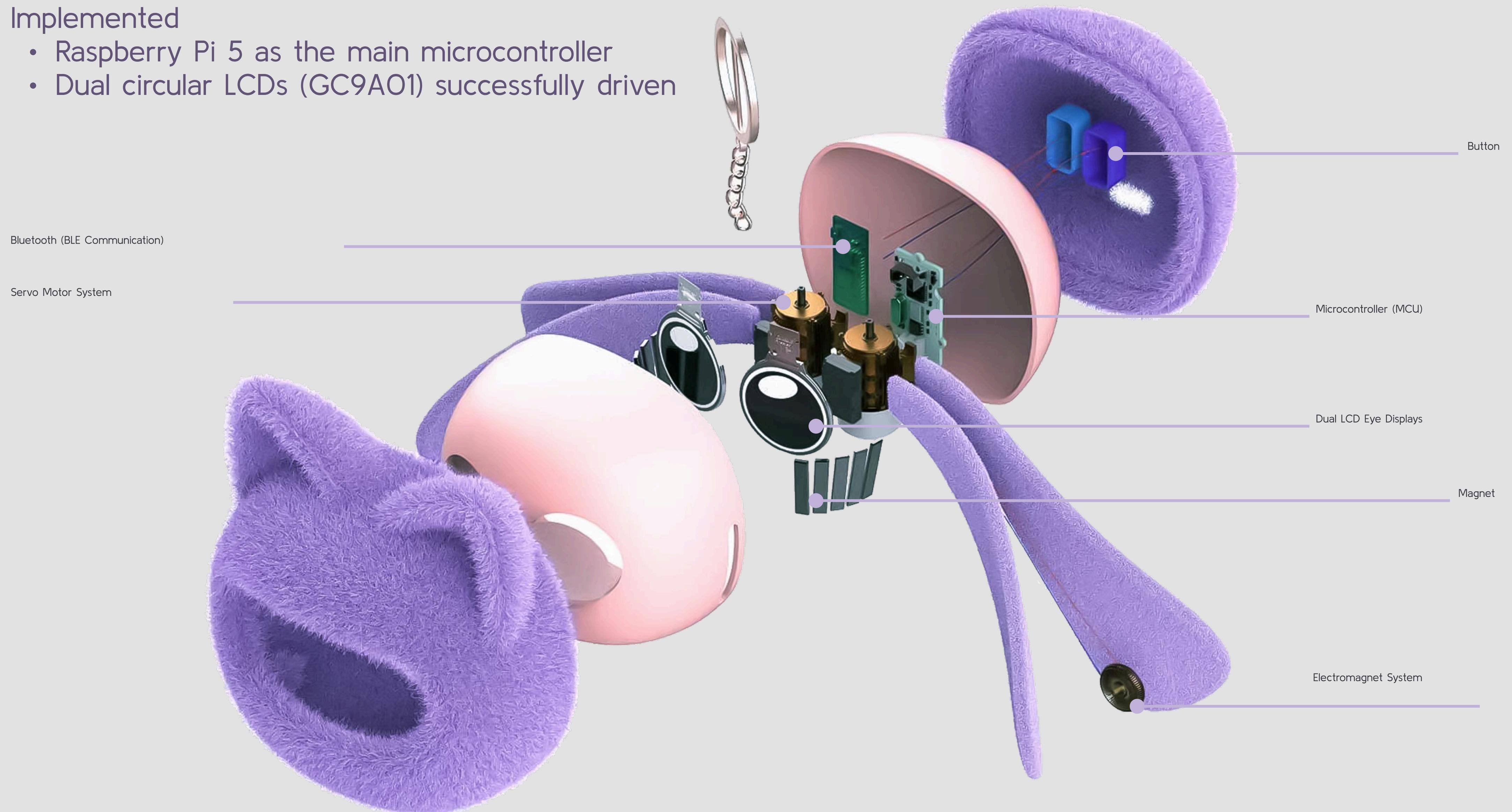






Implemented

- Raspberry Pi 5 as the main microcontroller
- Dual circular LCDs (GC9AO1) successfully driven



ROBOT - WALKIE

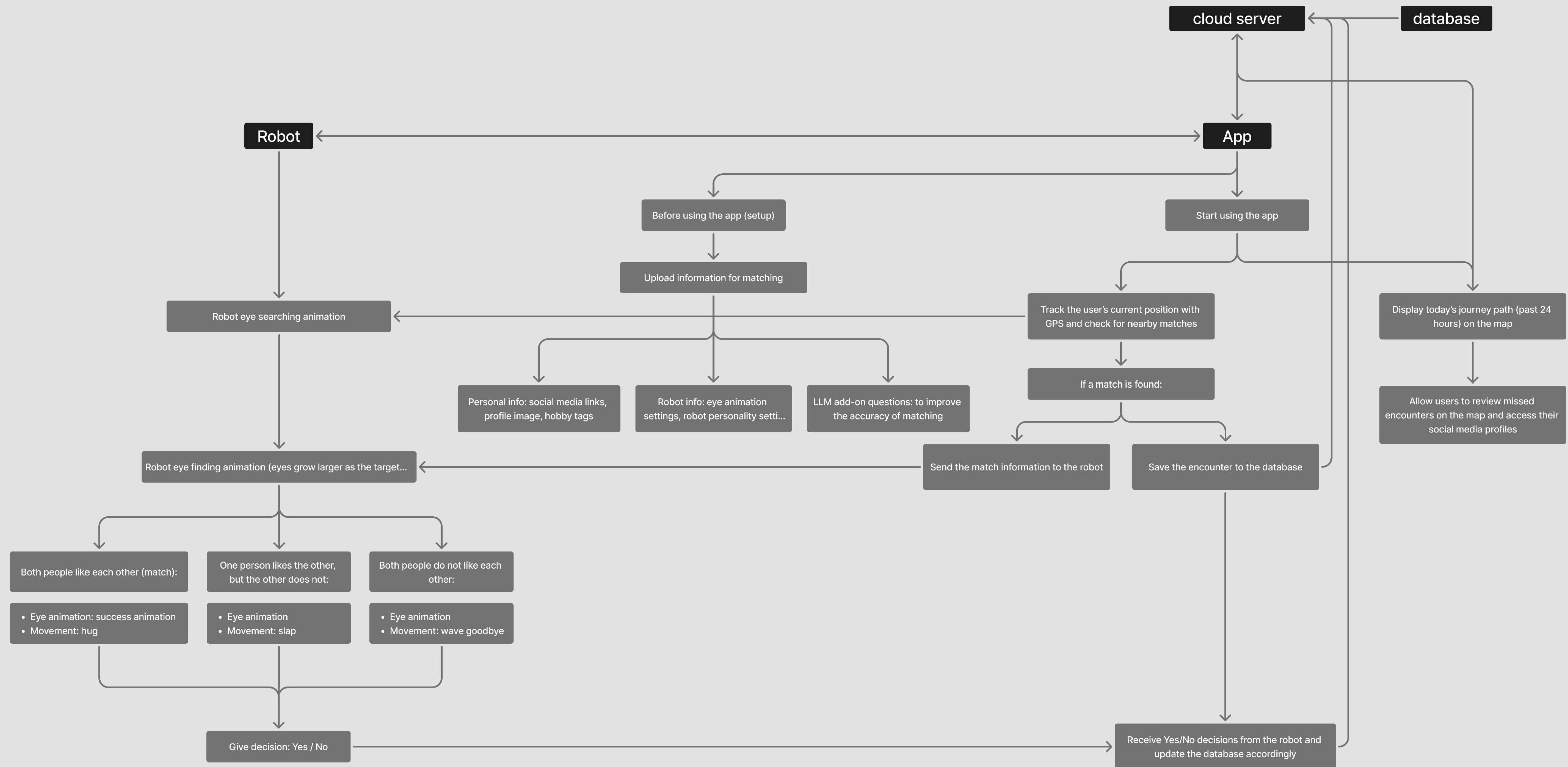
- Facial Animation Rendering
- Bluetooth Phone Connection
- LCD Display Output
- Physical Motion Module
- Button Input

Cloud Server

- User Data Storage
- Matching Algorithm Engine
- GPS-based Proximity Detection

APP

- Preference Settings on App
- Store & Send User Info to Cloud
- Store & Send Robot Personality Config
- Store & Get History Info from Cloud
- LLM Personality Builder

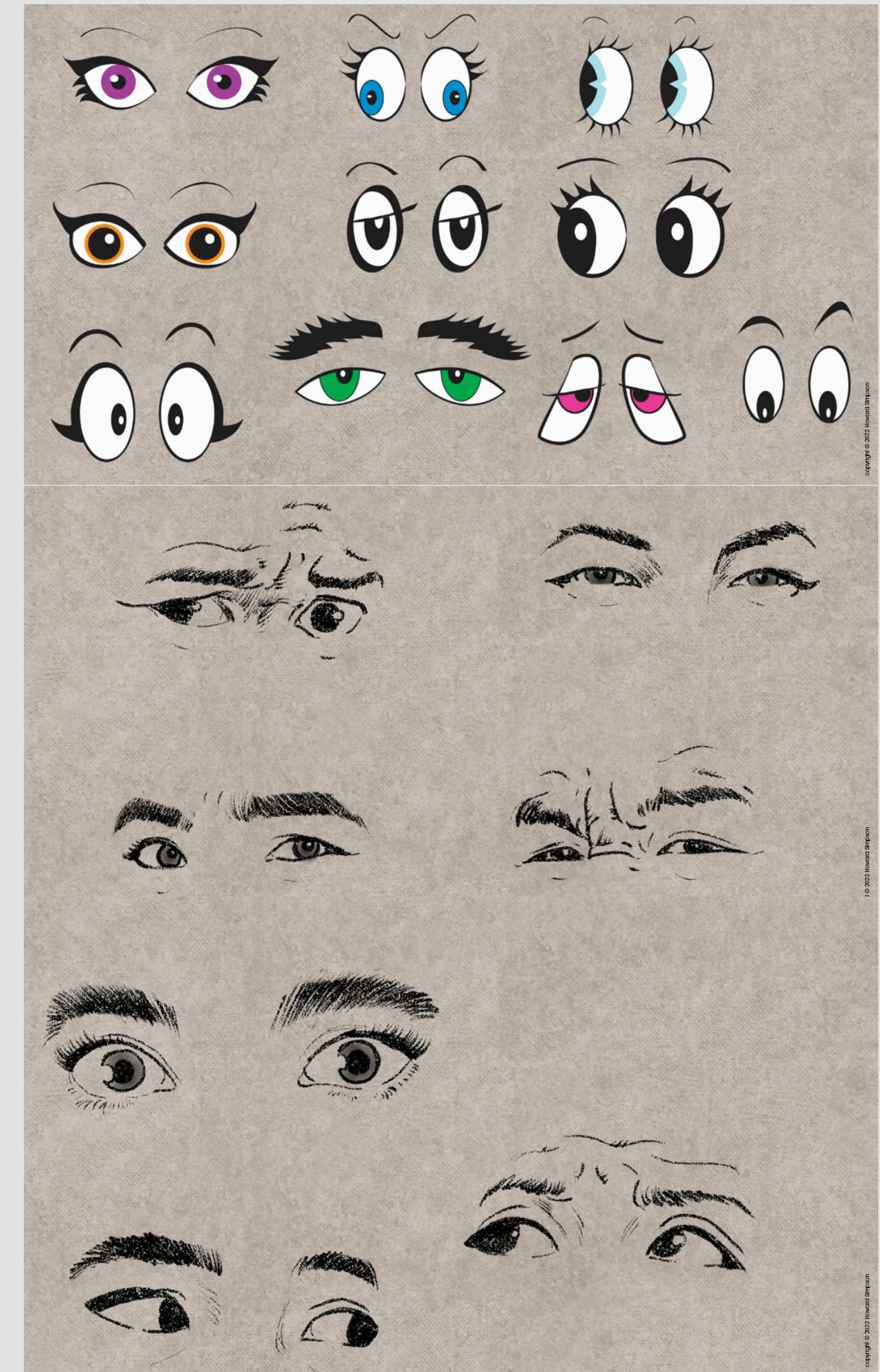


Eye Design Study

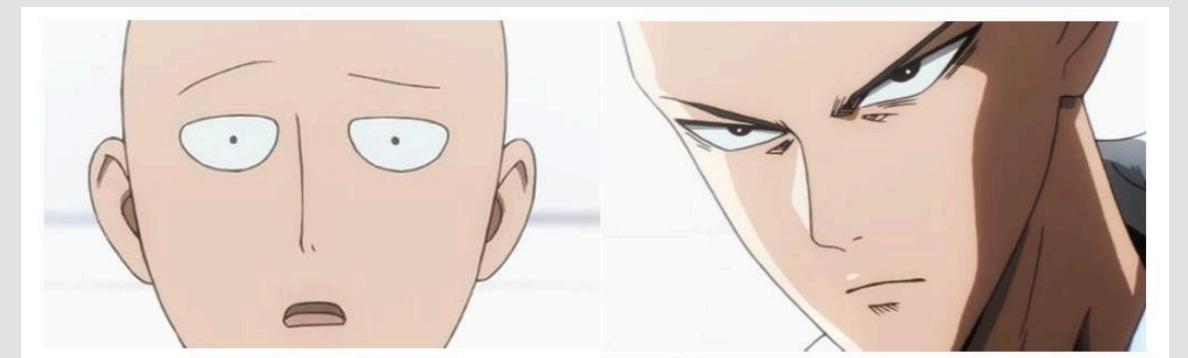
Emotion-Rich Channel

Approachability Through Simplification

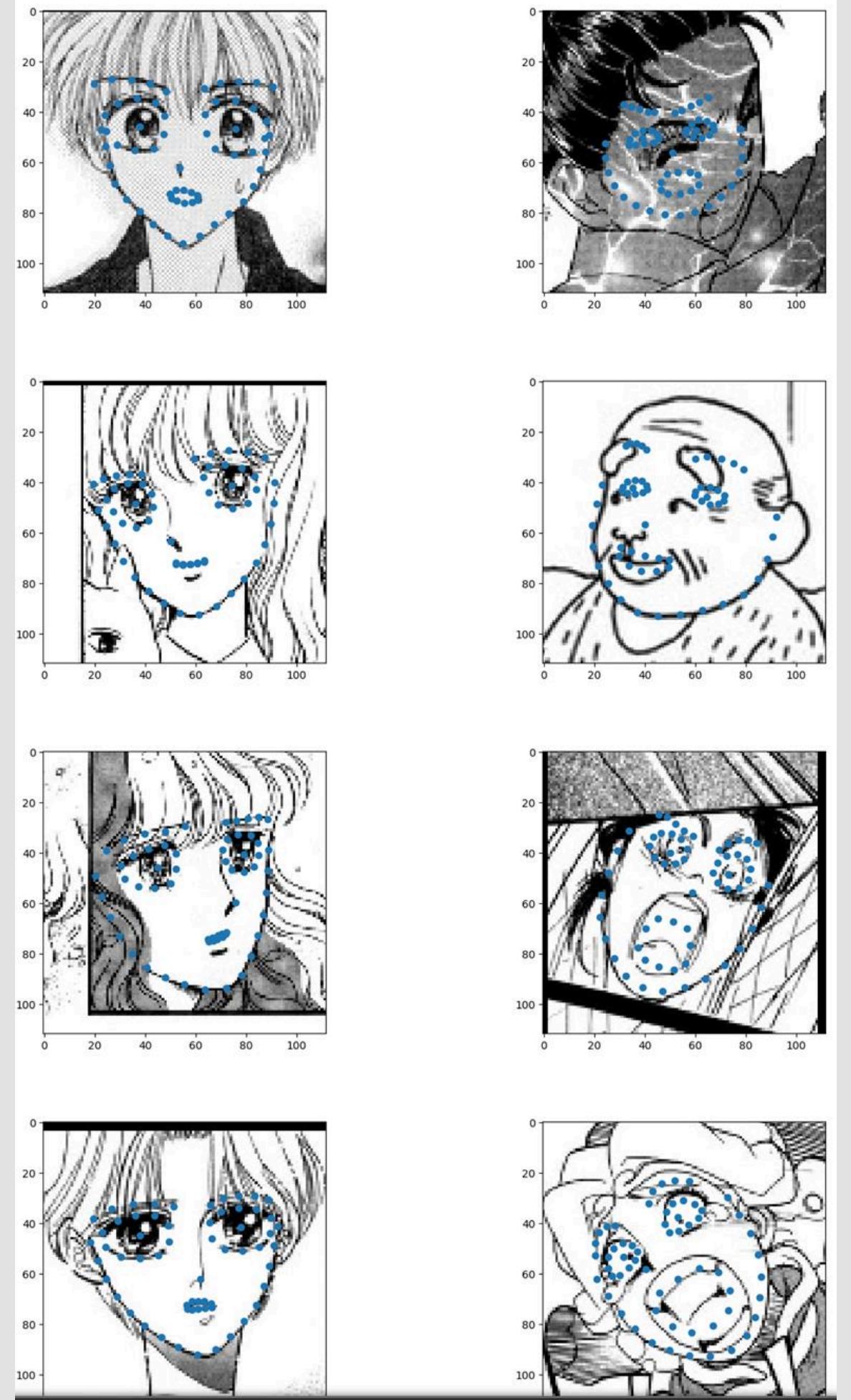
Effective Non-Verbal Signaling



Clip Studio Tips Editorial Team. "Drawing Tips to Show Emotions with Eye Design." Clip Studio TIPS, 2022.



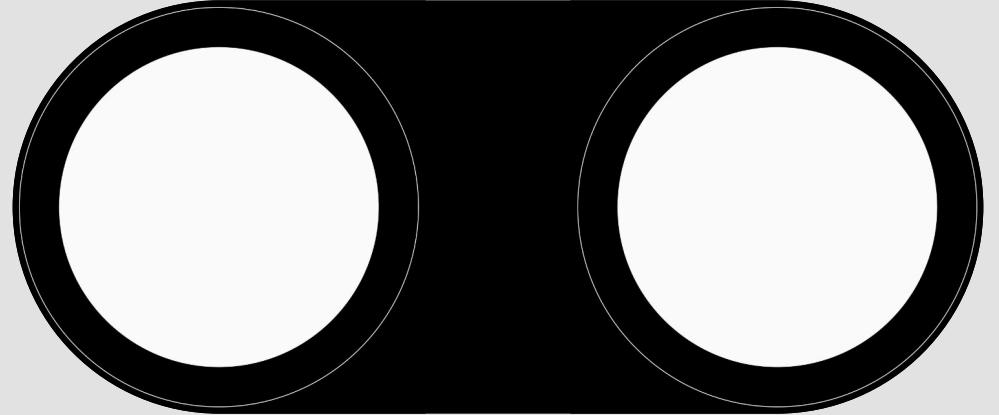
Tang, Y. "An Exploration of Eye Design of Japanese Animation Characters." International Journal of Social Science and Education Research 3, no. 10 (2020): 68–71.



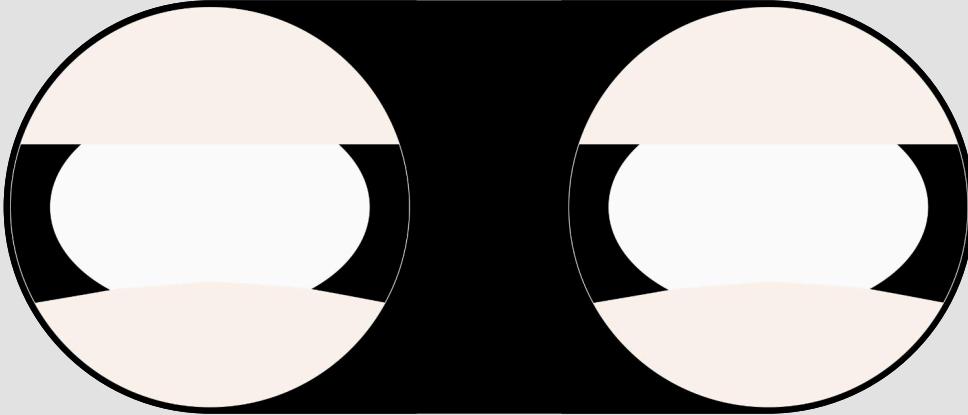
Stricker, Marco, Olivier Augereau, Koichi Kise, and Motoi Iwata. "Facial Landmark Detection for Manga Images." arXiv preprint, 2018.

Eye Display Design - Basic Function

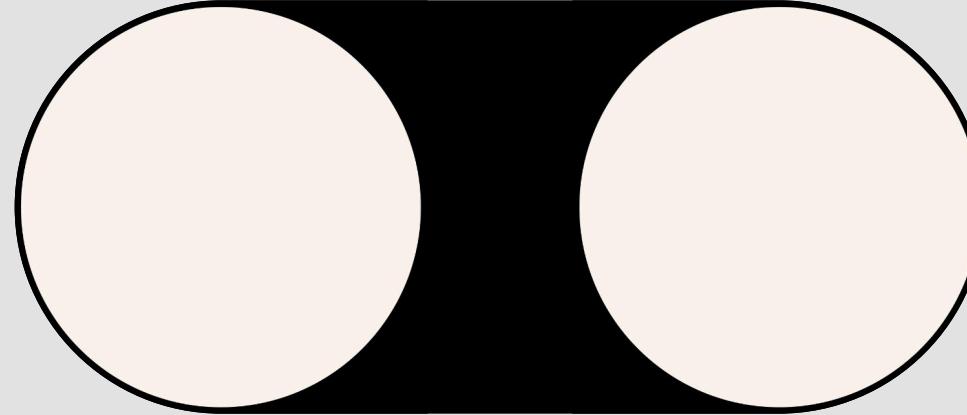
Staying in one spot - 1day



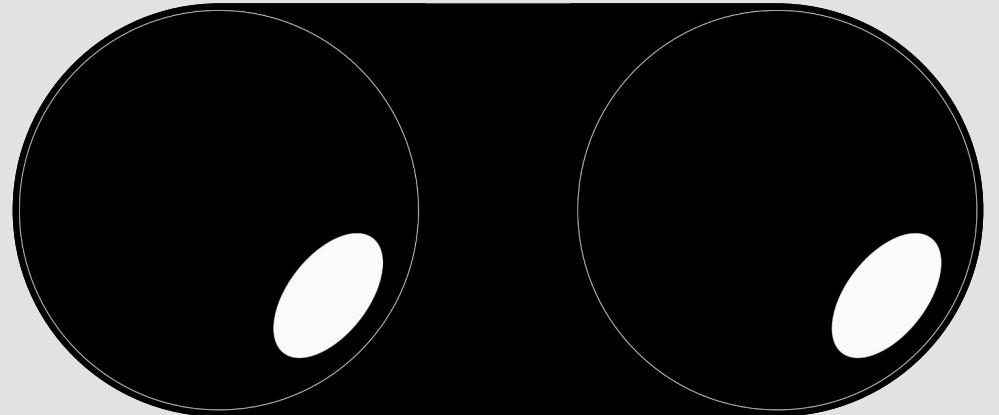
Staying in one spot - 2day



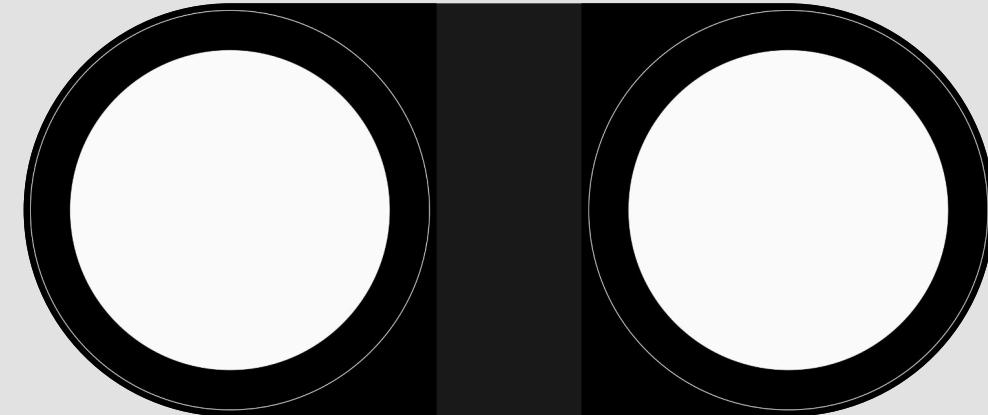
Staying in one spot - 5day



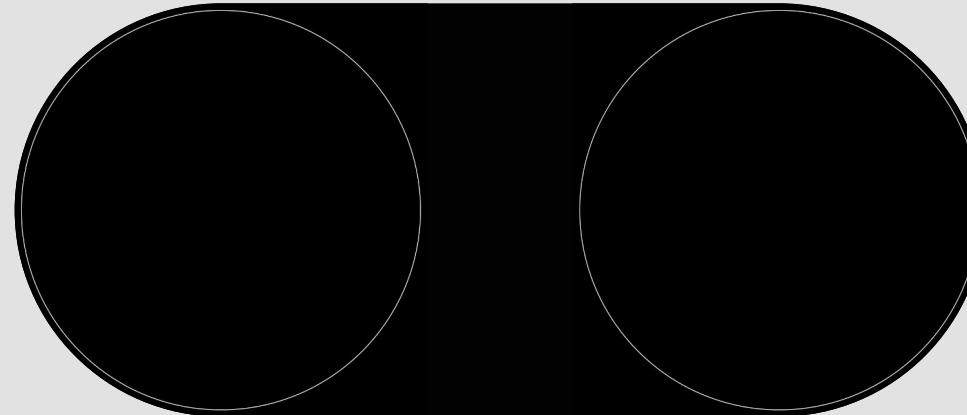
Error - 1



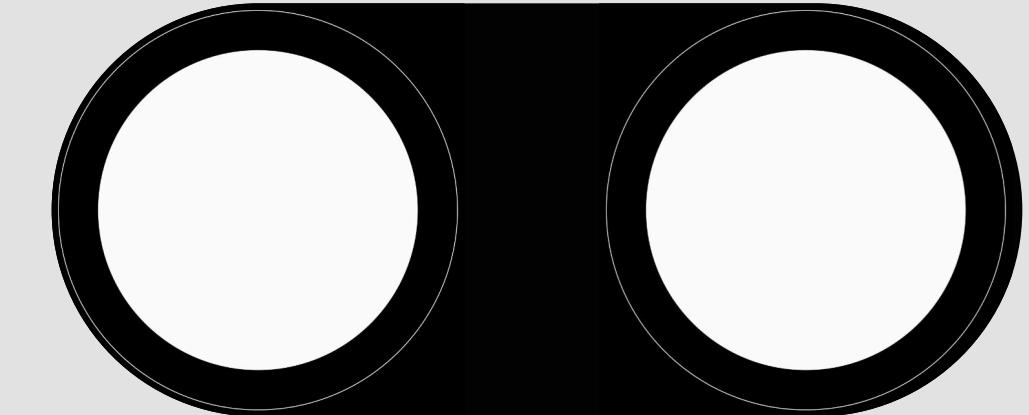
Error - 2



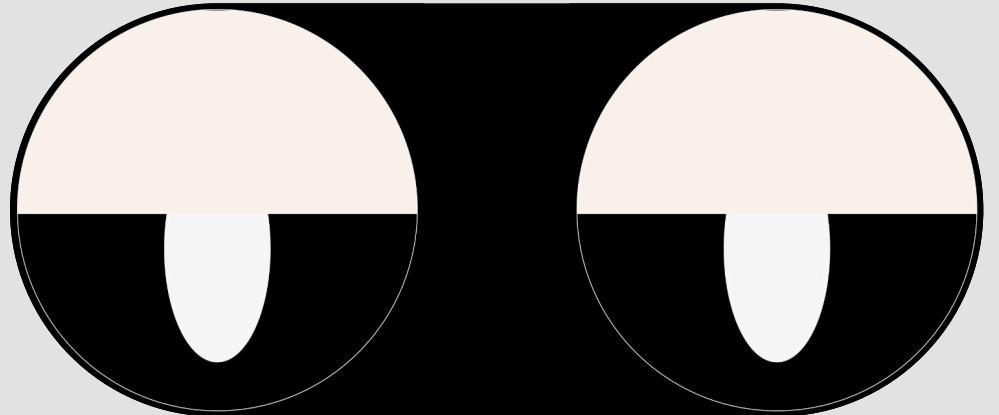
Turn ON



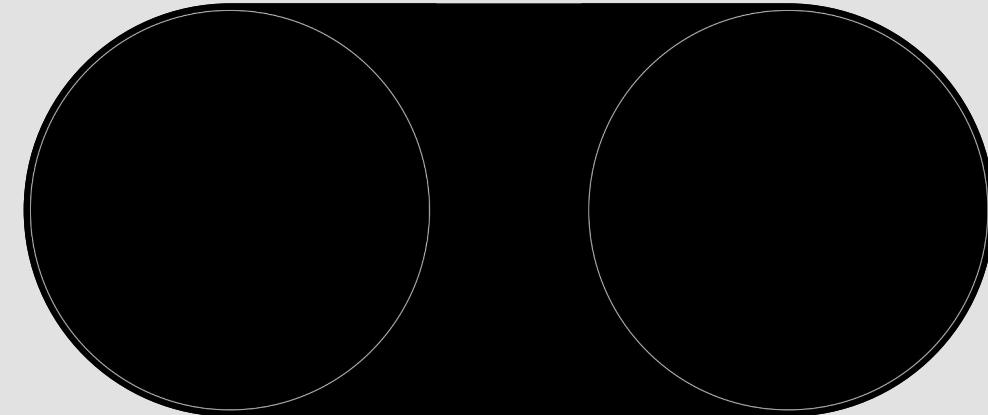
Turn OFF



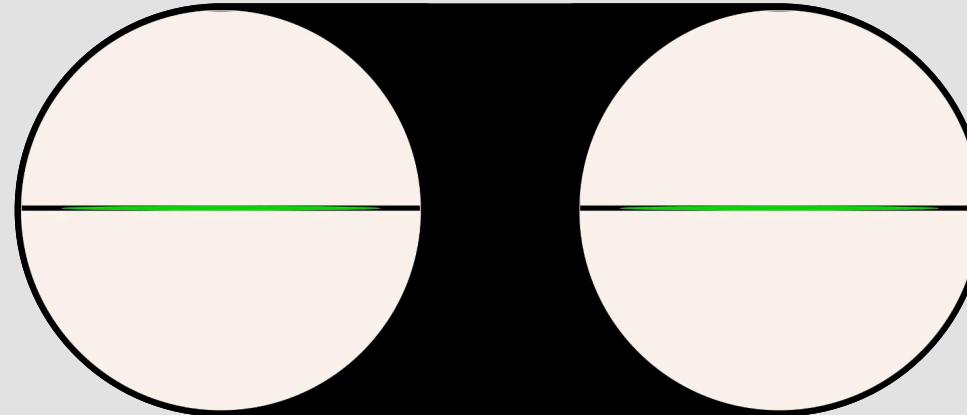
Run out of power



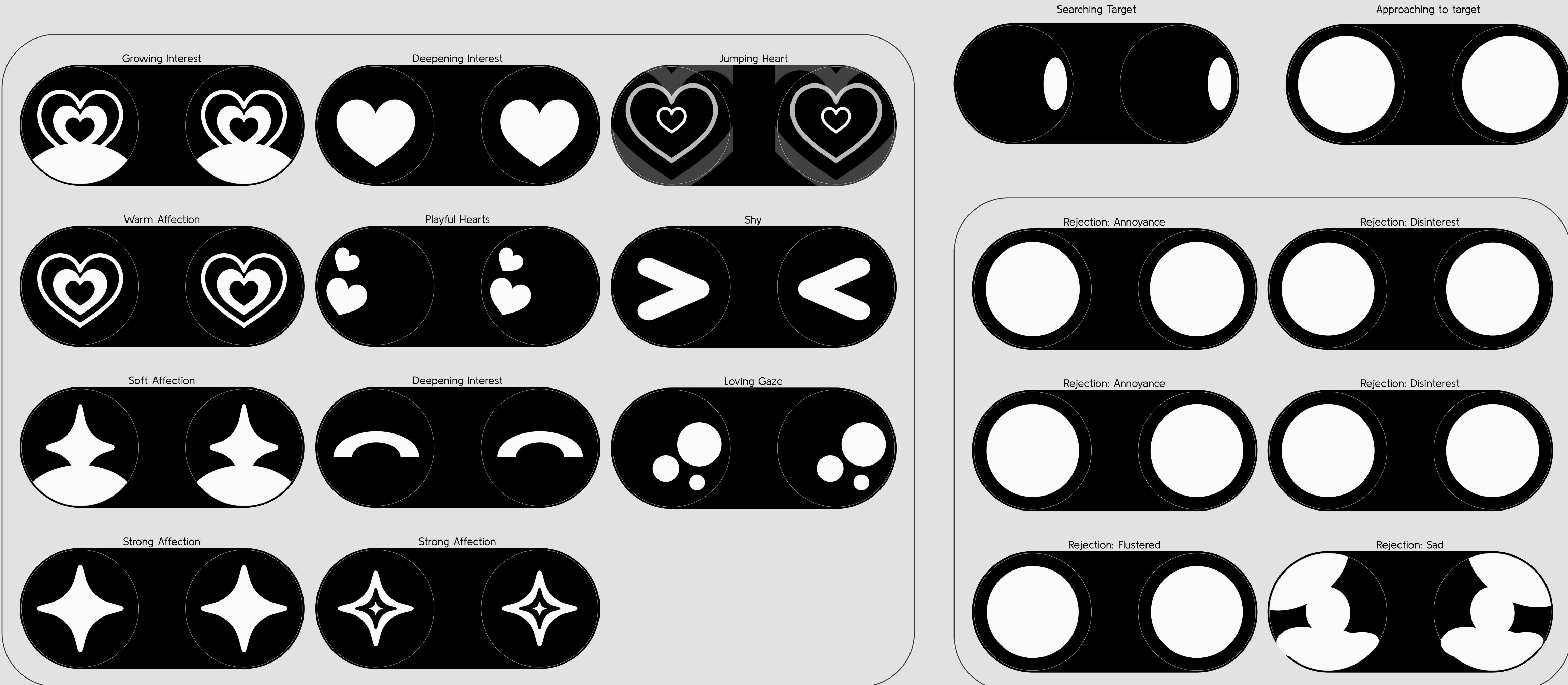
Charging



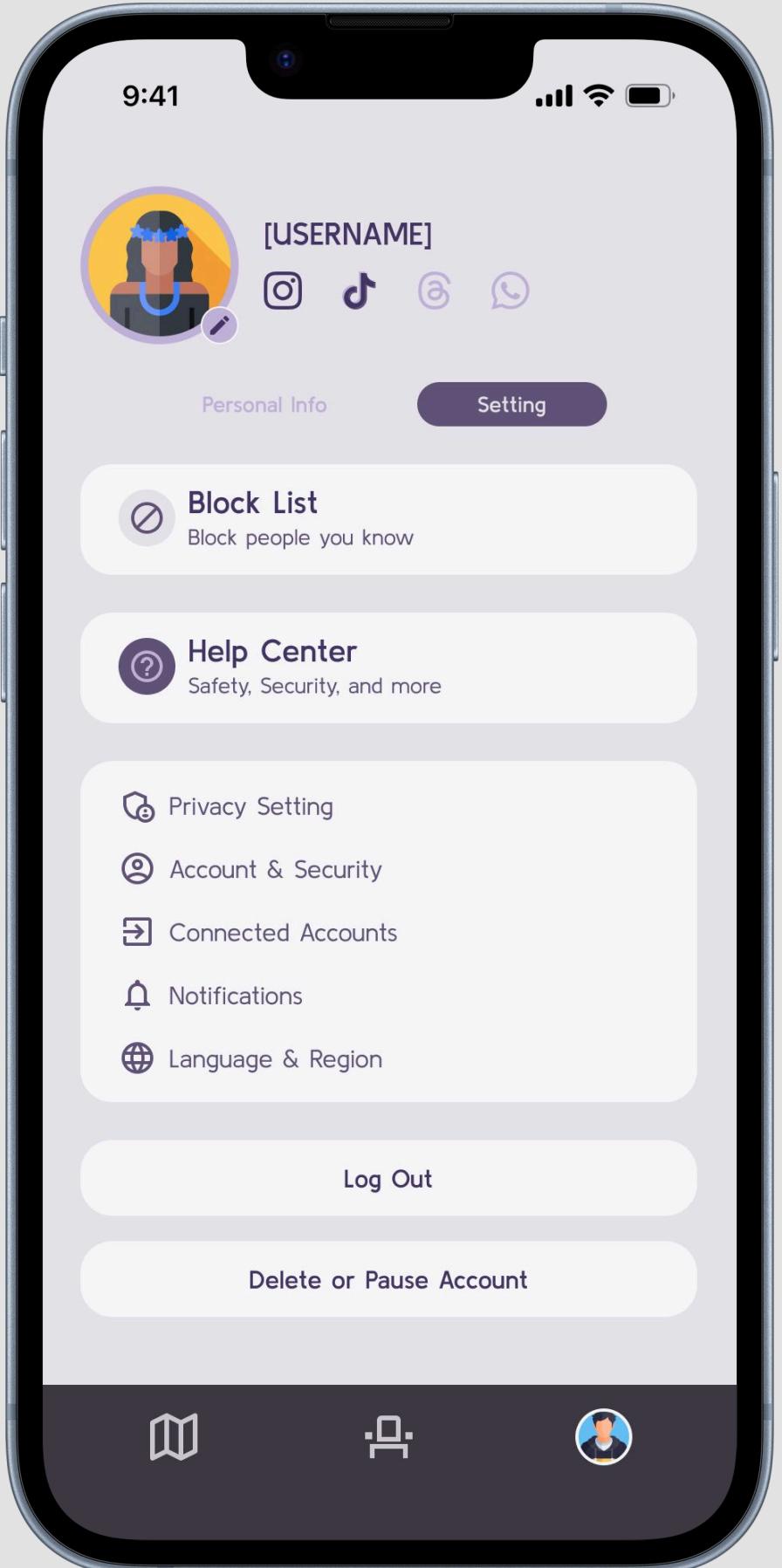
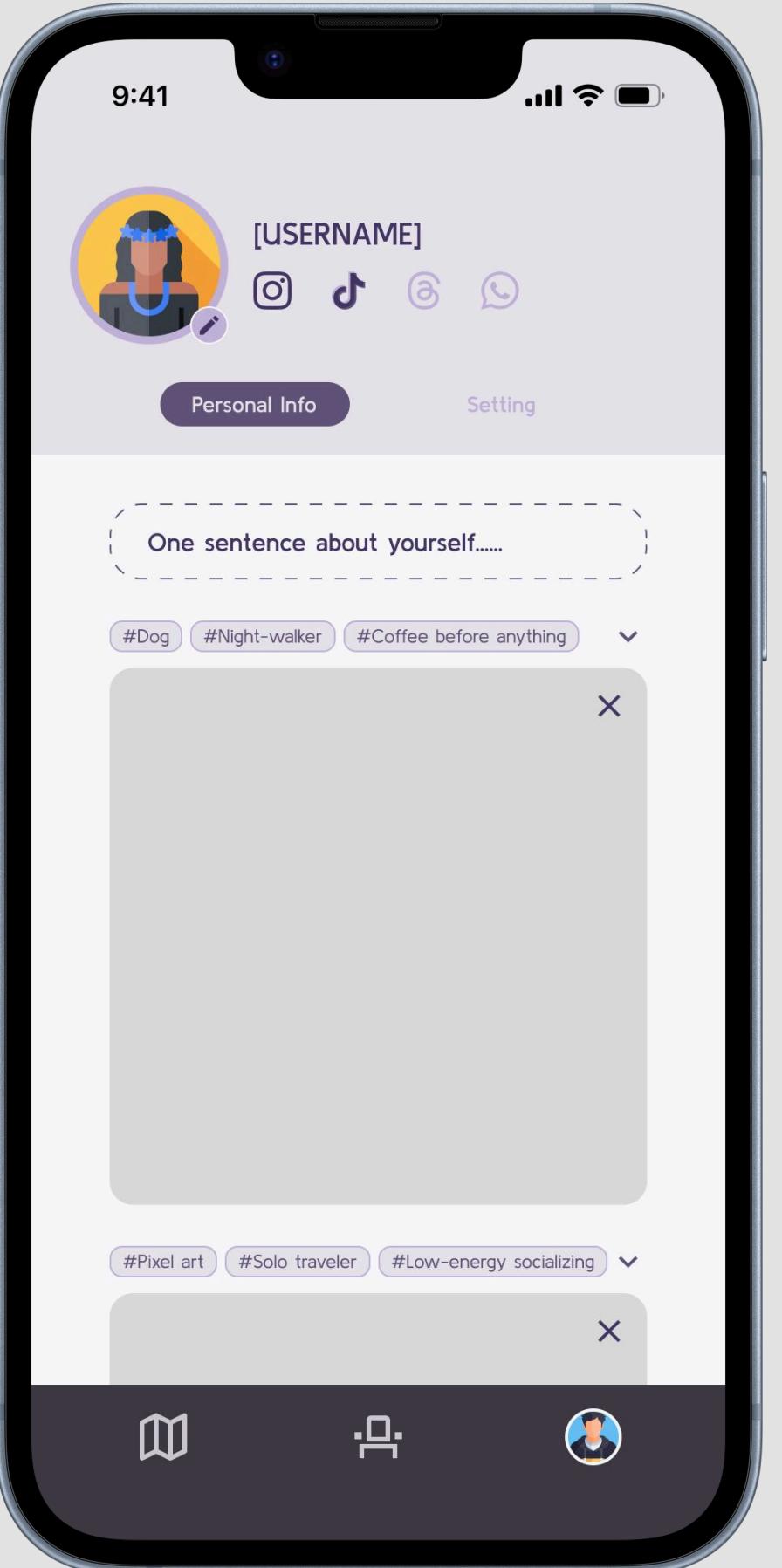
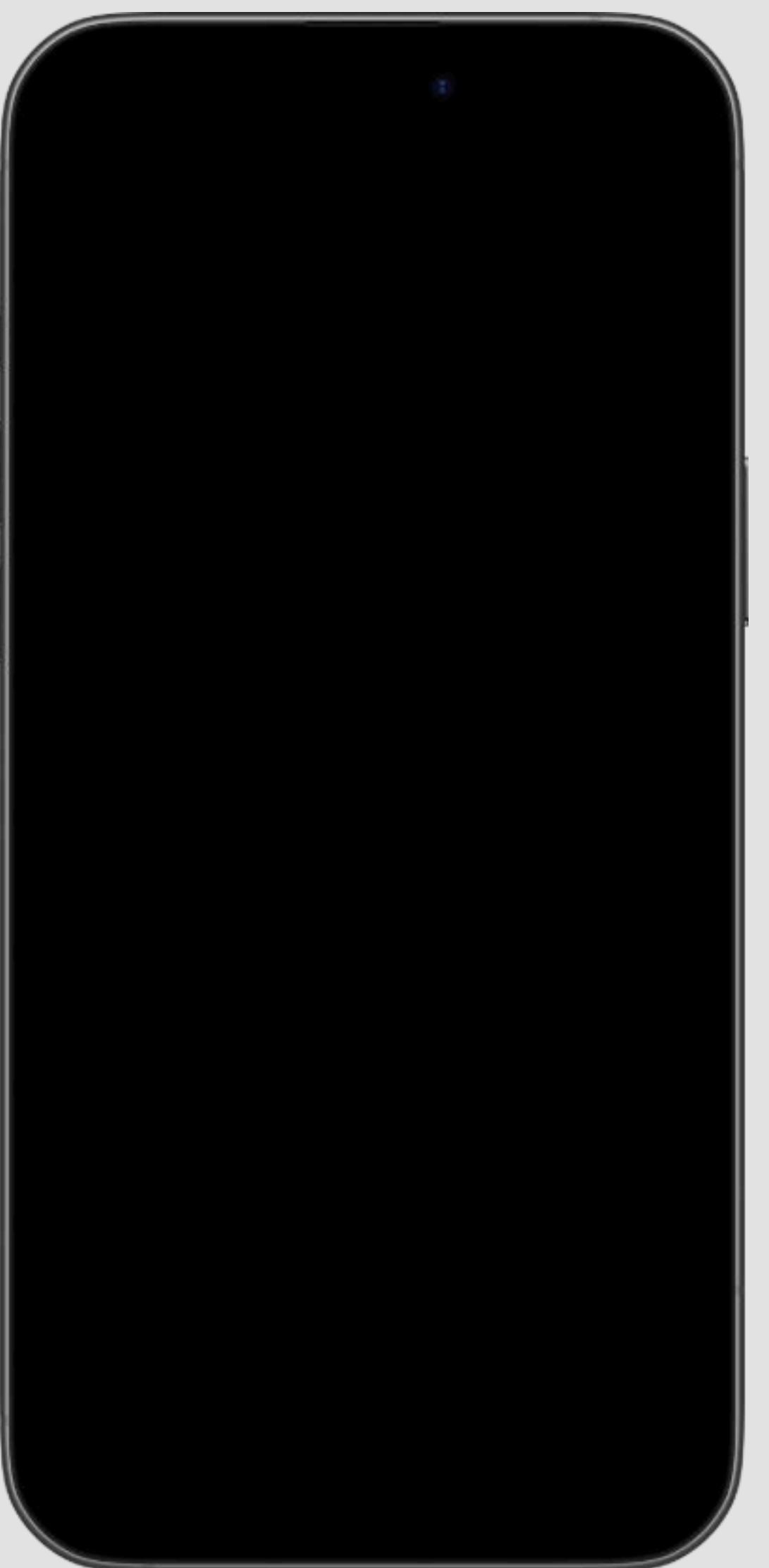
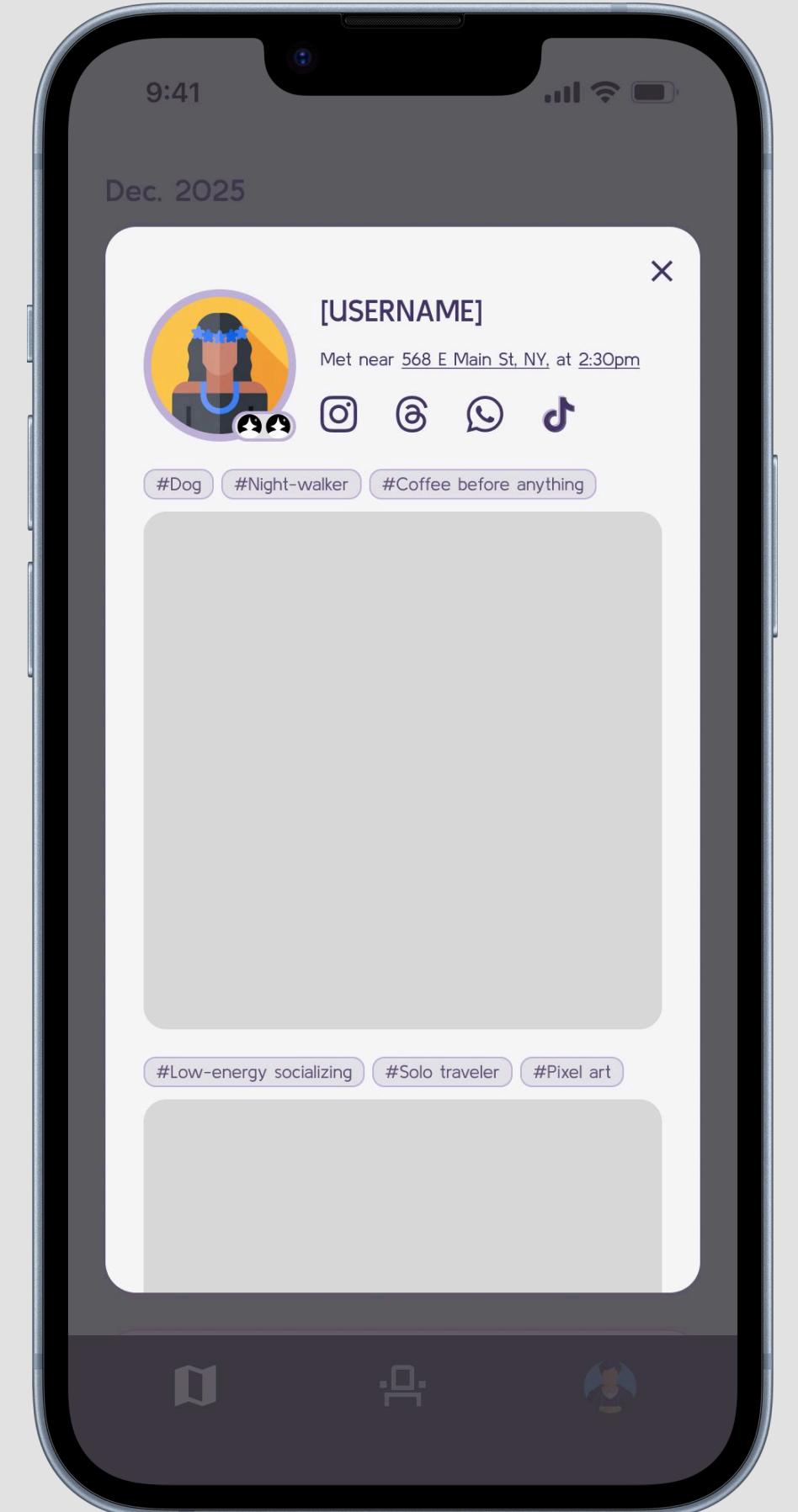
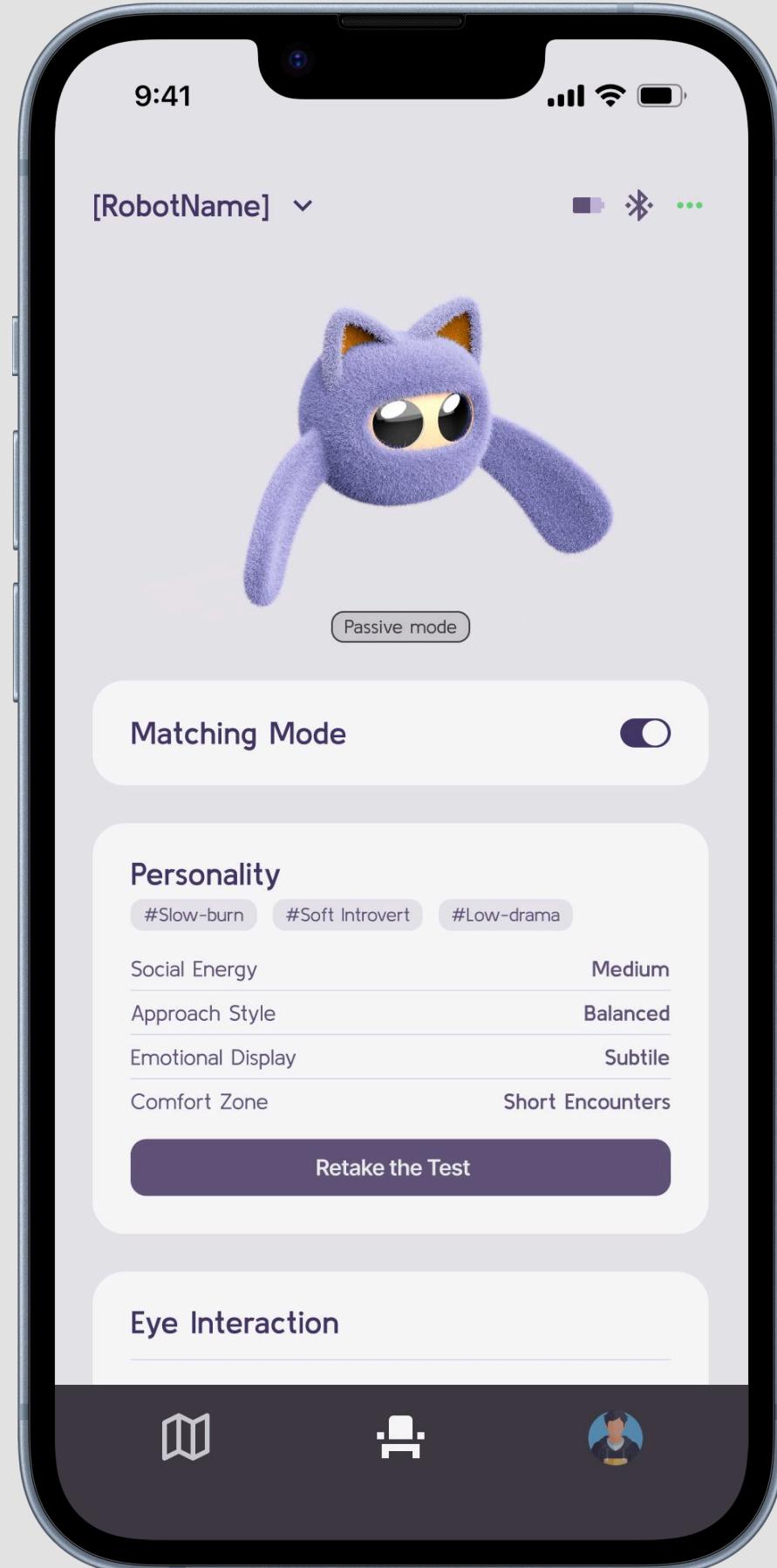
End of charging



Eye Display Design - Matching Status









9:41

[RobotName]



Passive mode

Matching Mode

Personality

#Slow-burn #Soft introvert #Low-drama

Social Energy Medium

Approach Style Balanced

Emotional Display Subtle

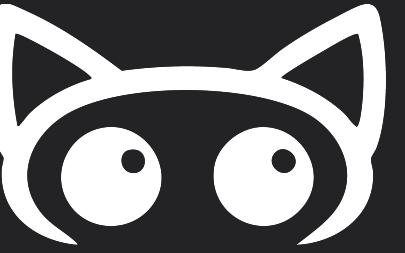
Comfort Zone Short Encounters

Retake the Test

Eye Interaction



veo



THANKS

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