A Garden I Carry

Timeframe
Oct-Nov 2025

Type
Solo Project

Focus
Emotional Interaction Design · Generative Visuals · Vibe Coding

Outcome
Web Prototype

Link
https://694e63fcdae7f10009a5c4cc--a-garden-i-caryy.netlify.app

A Garden I Carry explores the emotional relationships people form with the objects they carry every day. Through an interactive system that combines image capture, generative visuals, AI-driven dialogue, and physical output, the project translates personal belongings into flowers that gather into bouquets and a shared garden. By shifting focus from function to feeling, the work aims to create a reflective space where everyday objects are re-seen as emotional presences rather than tools.

Inspiration

Rethinking Touch

We constantly touch, carry, and rearrange objects—yet rarely reflect on what these actions reveal about us.

This project began with a simple question: what does it mean to touch something today?Touch is our earliest way of understanding the world. Yet as adults, touch becomes regulated.

Public objects are guarded behind signs that say "do not touch." What remains close to us, then, are the things we carry.

Observation: Daily Actions

I observed that “bags” become quiet archives of our habits, anxieties, memories, and comfort. We tuck things inside for reasons as small as "I might need this later" or as soft as "I don't want to forget this." These objects move with us, absorb our daily rhythm, and witness our private life. I wondered if technology could reveal the emotional landscape hidden inside these belongings.

Daily carrying behaviors reveal unspoken emotional relationships between people and objects.

Design Opportunity

Making Invisible Emotional Relationships Visible

Everyday objects carry emotional meaning that often goes unnoticed. There is an opportunity to surface these quiet relationships without reducing them to labels or metrics.

Reframing Touch Beyond Utility

Touch in digital systems is usually functional or restricted. This project explores touch as emotional presence rather than task completion.

Designing for Reflection Instead of Optimization

Most interfaces prioritize speed and correctness. There is space to design interactions that slow users down and invite reflection rather than efficiency.

Research

User Study

To ground the project in real-world behaviors, I conducted an exploratory survey with 20 participants focusing on bag usage and object-carrying habits. Participants were 80% women, with mixed urban and campus-based lifestyles. The data revealed recurring patterns in how individuals pack, retain, and emotionally relate to everyday objects. These insights informed initial personas and guided subsequent design decisions and interaction hypotheses.

Suprise
70%
carry at least one uncommon or unexpected item

Items Carried Daily
55%
carry 15+ items in their bag on a normal day

The keeper
35%
change only a few items, keeping most contents the same

Carry vs Use
55%
use only a few or rarely any of the items they carry daily

Social Connection
90%
of who is in a relationship carry at least 1 thing about about their partner

Routine & Carry
65%
report having a relatively consistent daily routine

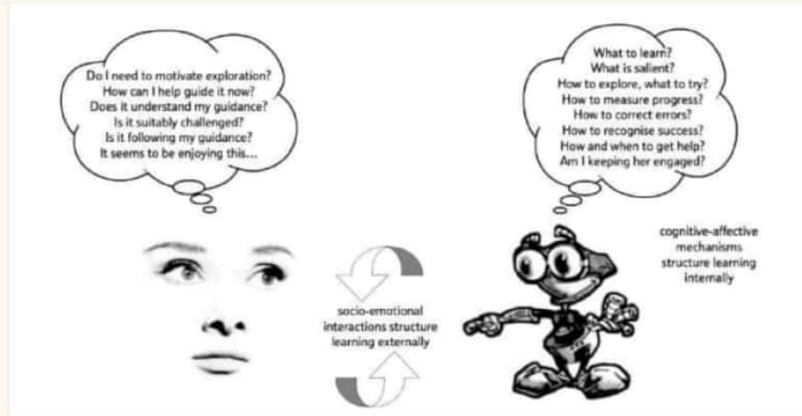
Self-Representation
80%
identified one item that represents themselves

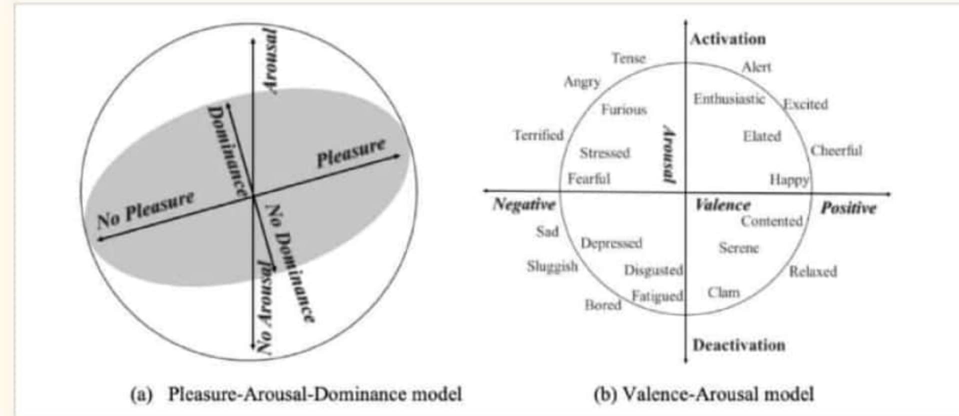
Bag Adaptation
30%
switch to a different bag entirely when plans or environments change

Theoretical Grounding

After user research and data analysis, I grounded my design decisions in **Affective Computing** and **Embodied Cognition**, including the Extended Mind thesis. Affective computing, as defined by Rosalind Picard at the MIT Media Lab, treats emotion as a core component of human–computer interaction. The Extended Mind theory suggests that cognition extends beyond the brain into everyday artifacts.

Within this framework, the bag is understood as an extension of body and mind, where daily gestures—packing, searching, and carrying—externalize memory, anxiety, identity, and preparedness through repeated interaction with objects.





Persona & Interview

I followed up with 2 typical users and do interview with them.

"I carry a ugly big bag pack every day for school. But if I were to going out or have fun, I will put on a cute little handbag with all my makeup and stuff."

Age: 22

Undergraduate Junior

Bag Habit

Bag as modular identities. One bag for class and commute. Another bag for going out, parties, or social moments.

Carrying Behavior

- Carries essentials for school, study, and transit
- Chooses items that signal taste or personality
- Switches bags entirely when moving from "day mode" to "fun mode"

Relationship to Objects
both practical and expressive.
The bag is not fixed. It is a curated surface that changes with context.

As a freelancer i get to work wherever i want. I will spends most of the day outside, at a cafe or bar, chilling and working. I make sure i have everything i need for the day."

Age: 27

Product Designer

Bag Habit

Her bag is a mobile base. It needs to hold everything she might need across a full day.

Carrying Behavior

- Uses large, heavy, or structured bags
- Carries tech, chargers, personal items, and comfort objects
- Rarely empties the bag completely

Relationship to Objects
Objects are tools for survival in the city.
The bag becomes an extension of living space rather than a temporary carry.

Can you walk me through what you usually carry in your bag and how often you interact with it during a typical day?

Are there any items in your bag that you rarely use but still choose to carry? Why?

How does the content of your bag change over time daily, weekly, or across different life situations?

If your bag contents could be visualized as something living or growing, what would that feel like to you?

When packing or searching your bag, do you feel these actions are mostly automatic or intentional?

Conclusion

Across both survey data, a consistent gap emerged between functional use and object retention. Participants frequently carried items that were rarely used or difficult to explain, yet intentionally kept. Interviews revealed that these objects persist not for immediate utility, but for the mental reassurance they provide. They were described in terms of comfort, habit, identity, and emotional safety, functioning as psychological anchors that offer preparedness and a sense of continuity. This gap between actual use and emotional significance suggests that a function-based classification cannot fully explain why objects are carried, motivating a shift toward an emotion-based object taxonomy.

Idea Development

Emotion-Based Object Taxonomy

After interviews and user analysis, I abstracted bag contents into a systematic taxonomy. I adopted an emotion-based framework that interprets objects through four expressions—comfort, intention, identity, and inner life. This approach encourages reflective rather than evaluative interaction, preserving personal meaning over fixed labels. By focusing on emotional relationships instead of function, the taxonomy provides a more stable way to understand how people choose, keep, and relate to their belongings.

Comfort

What makes us feel anchored, safe, or emotional grounding in unfamiliar or shifting environments.

Sample items: medicine, lip balm, hand cream, tissues, snacks, small personal accessories.

Productivity

What helps us navigate daily tasks and goals, maintaining focus, efficiency, and a sense of control.

Sample items: laptop, charger, notebook, planner, headphones, power bank.

Expression

What chosen to communicate identity, taste, or mood, often serving as visible markers of how one wishes to be seen.

Sample items: keychain accessories, stickers, fashion accessories, uniquely designed objects.

Inner Self

What we keep private, meaningful, or sacred, carrying personal meaning that may not be shared or explained.

Sample items: handwritten notes, old receipts, photos, charms, letters, sentimental tokens.

Design Hypothesis

Emotion-based categorization reframes everyday objects as relationships rather than tools. By simulating emotional touch patterns through digital interaction, interfaces can shift from task-oriented systems to spaces that invite reflection.

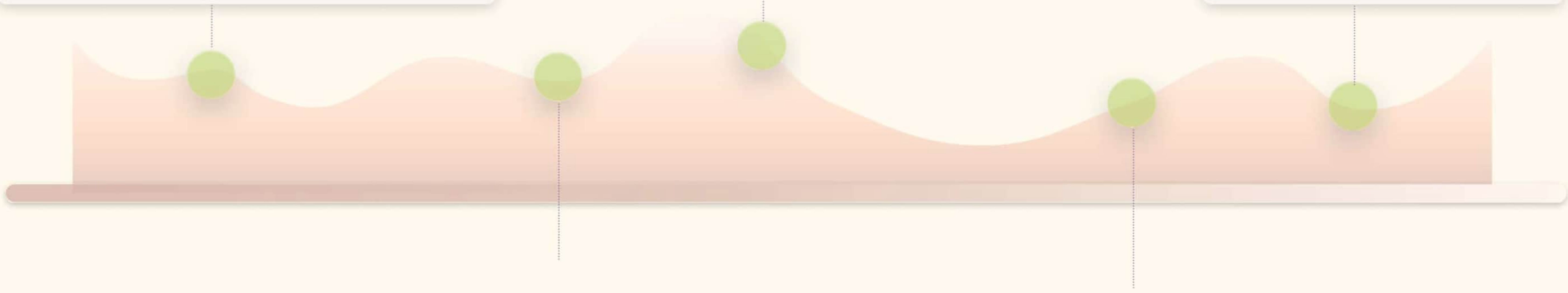
Object → Emotional Role → Interpretation → Interactive response

Design Flow & Goal

Determine the **classification and identification** of interactive experiences

The necessary interaction behaviors **(taking out, identifying four types of emotions)**

Visual interaction and interaction：**Virtual + Real** experience



Virtual pages with real-world operational experience: 1. Changes over time 2. Supports variations 3. Gives a personal and intimate feeling 4. Allows for ambiguity

After interaction, based on the viewer's behaviors of the participants, provide **visualized feedback**.

By translating emotional relationships into interaction rules, the taxonomy becomes a generative system rather than a static classification. It directly informs interface behavior, interaction flow, and technical implementation, transforming the website into a space for emotional reflection rather than functional browsing.

Reference & Case Study

I draw inspiration from Agnes Denes's Pyramid works and Studio YOY's Puddle series for their contrasting treatments of individuality and collectivity. Denes's pyramids compress multiple memories and values into a single shared form, while Puddle grants each flower its own spatial autonomy, allowing individual presence to fully emerge. While flowers are often grouped to create beauty through accumulation, Puddle resists this logic by insisting on the significance of each single form. Together, alll of **these references shape my approach:** carried objects are treated as distinct emotional entities that can **stand alone**, yet still participate in a **larger, shared landscape**.

Design Process

Visual Translation

After determining the design process, I began to explore the translation between item cognition and emotion, as well as visual design. And visual references and the sketches I drew.

	Individual item	4 Types	Multiple items	System-level UI
Contents	Single object	Comfort, Intention, Identity, Inner Life	Multiple objects from a bag	Entire bag / system interface
Interaction	Real-time scanning, packing/unpacking gestures	Object selection and categorization	Aggregation into personal bouquet	UI interaction, minimal intervention
Emotional State	Reflection, curiosity	Awareness of emotional categories	Reflection on personal habits	Calm, engagement, sense of overview
Visual Metaphor	Flower instantiated in virtual space with slight random variation	Initial mapping to 3D flower form based on category	Bouquet representing one bag; flowers coexist without hierarchy	Shared garden combining multiple bouquets; clean, cohesive 3D visual style

From Flowers to Bouquet to Garden

Object → Bag → Collective
Flowers → bouquets → Garden

Each carried object becomes a flower. A person's flowers form a bouquet, showing distinct emotional roles coexisting in one bag. Bouquets from many participants combine into a shared garden, where personal belongings grow side by side, each retaining individual significance without hierarchy.

Experience Flow

Primary Output

a digital generated bouquet, representing the collection of emotional roles within their bag.

It does not rank or summarize objects, but simply gathers them, preserving difference without hierarchy.

Tone and Pace

Slow.

Short pauses are built into the interaction to allow anticipation and reflection.

The DON'Ts

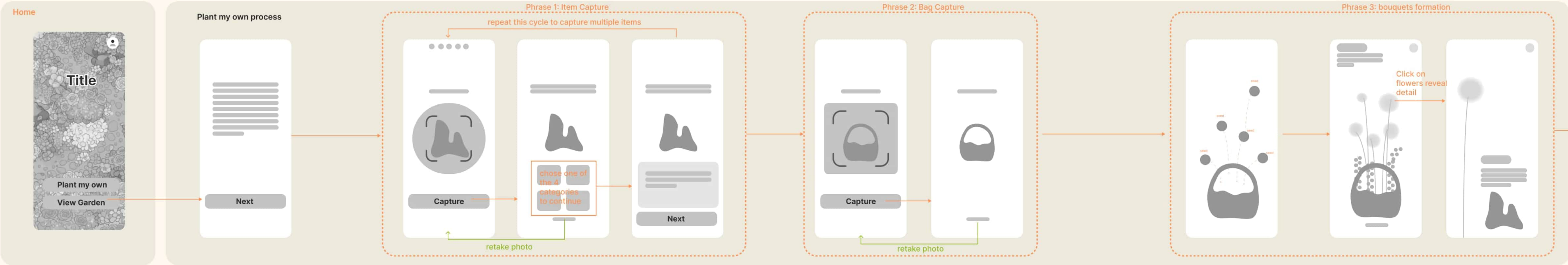
- judge objects
- optimize behavior
- explain meaning
- assign correctness

Secondary Output

a printed receipt with the response back from the items.

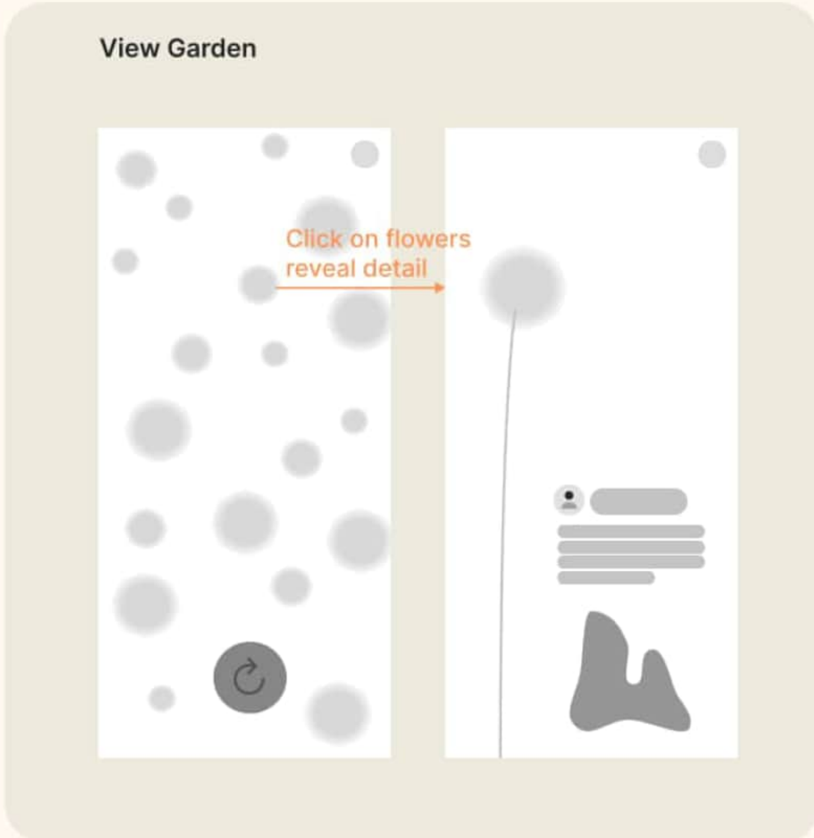
Hear your belonging speak back to you

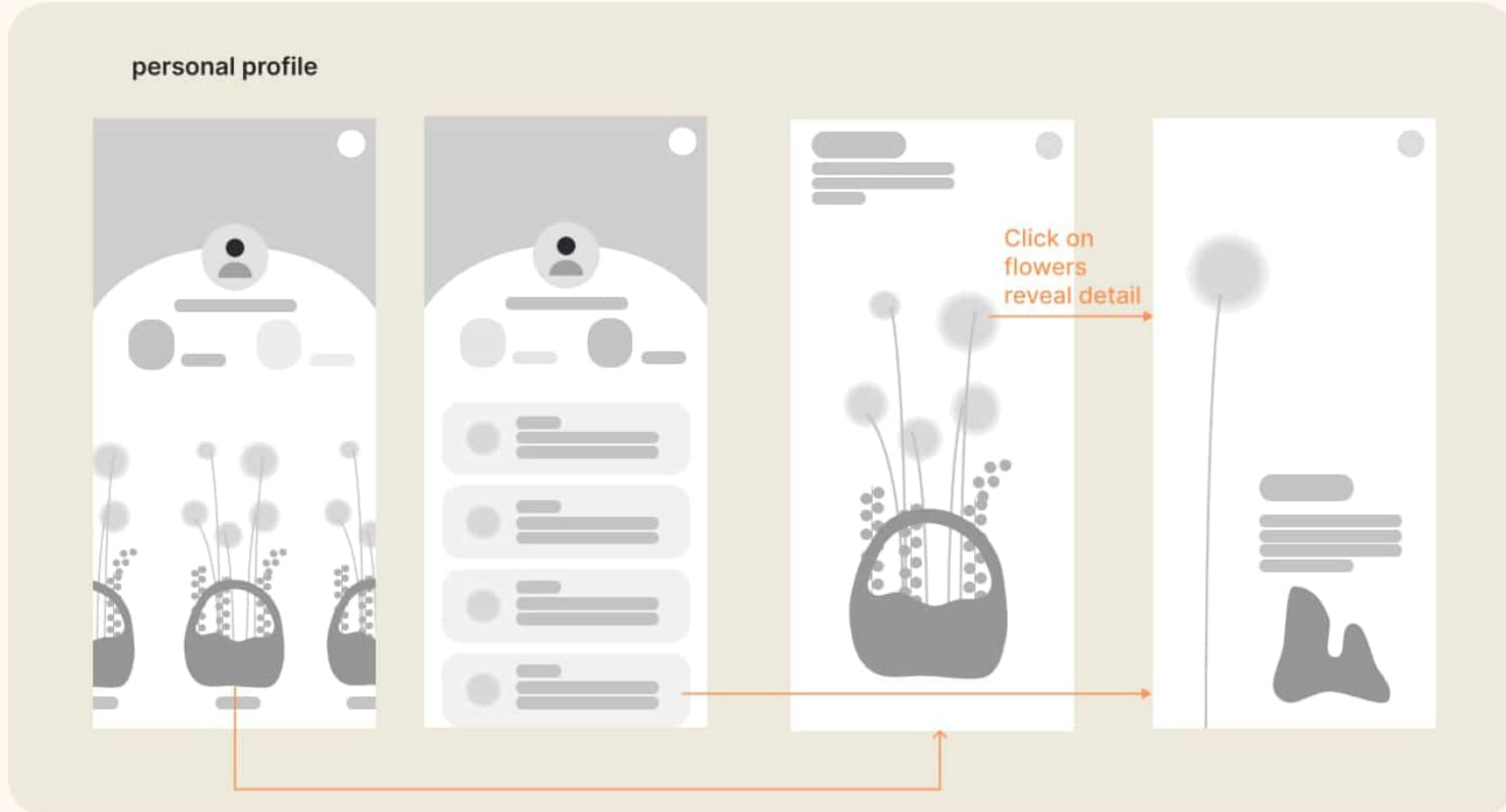
Wireframe

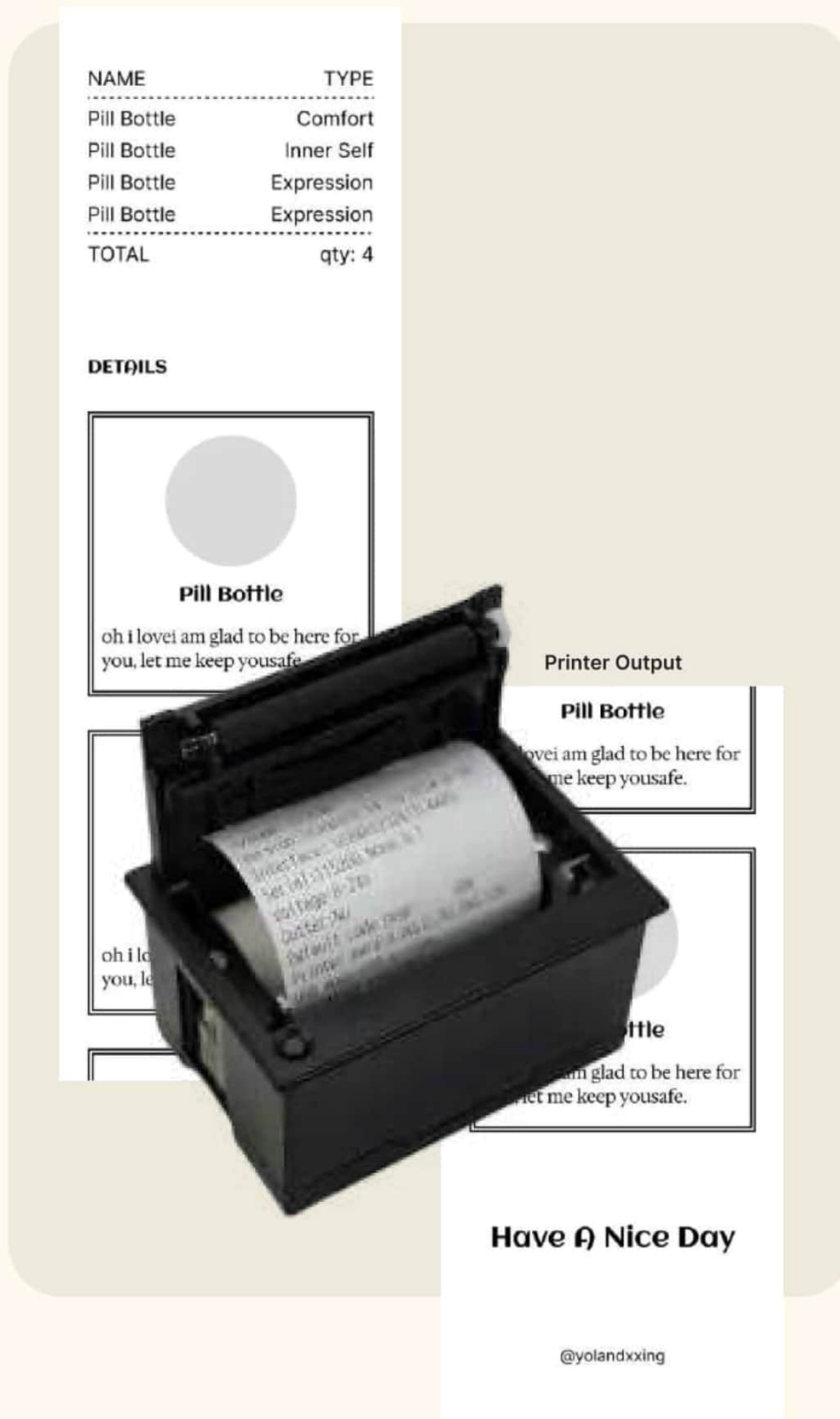


Four intentions

- **Comfort** — the interaction should feel gentle, steady, and private
- **Expression** — objects become extensions of the self
- **Memory** — each output is a small, tactile record of the moment
- **Affective Response** — the system acknowledges the user through tone, gesture, and language







Experience phrases:

Rather than defining multiple user personas, this project analyzes a single participant across three experiential states—before, during, and after interaction—highlighting how emotional awareness and object perception shift over time.

Before Interaction

Context	Public or semi-public space
Behavior	Carrying objects unconsciously
Emotion	Neutral, distracted
Design Implication	Soft entry, low pressure, non-intrusive invitation

During Interaction

Context	Direct engagement with the installation
Behavior	Selecting and exposing a personal object
Emotion	Curious, slightly vulnerable
Design Implication	Gentle pacing, clear flow, non-judgmental feedback

After Interaction

Context	Leaving the installation, returning to daily life
Behavior	Keeping the printed artifact, reflecting privately
Emotion	Acknowledged, contemplative
Design Implication	Tangible output that extends the experience beyond the space

Development with Vibe Code

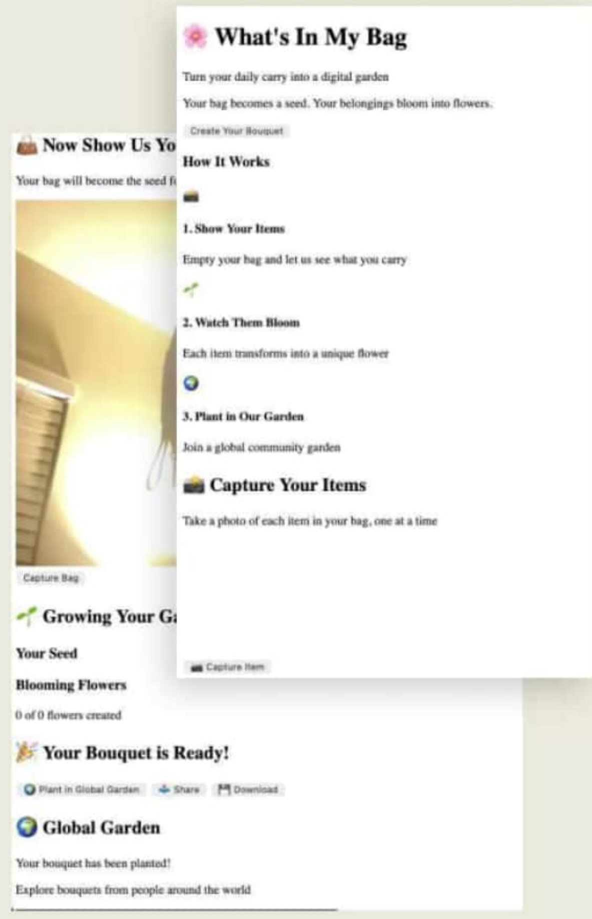
This project was developed through vibe coding, where technical decisions emerged through iterative testing and experiential tuning.

My Role	AI Role
Define Structure	Execute logic
Validate Plan	Generate Code
Provide Equations	Handle Syntax
Detext Drift	Iterate Fast
Judge	Apply

Starting from Zero (0→1 Framing)

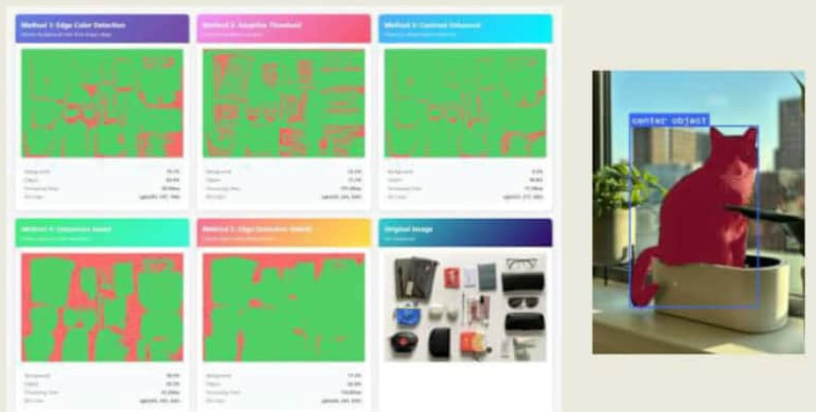
Starting from zero, the first prompt was critical in setting the overall structure of the project. I work through multiple rounds of conversation with AI, gradually clarifying what the system was actually doing in technical terms.

The first prototype produced at this stage was not visually close to the final experience, but it established the correct structural logic. There was no UI yet, only a working prototype that proved the system could function.



Building Features as Independent Components

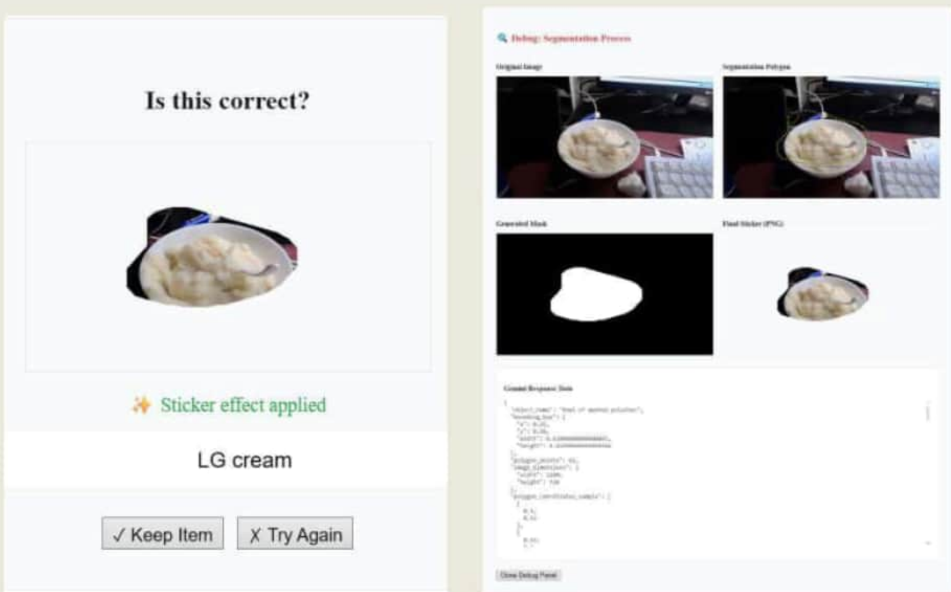
Instead of implementing everything at once, I developed each feature independently. Image recognition, prompting logic, animation timing, and the 3D environment were treated as separate modules.



- testing multiple image segmentation for best speed and accuracy.

Integration and Debugging Through Dialogue

When integrating components into the main environment, unexpected bugs surfaced. I used AI-generated debug warnings to expose system state in the console, turning debugging into a guided, collaborative process rather than trial and error.



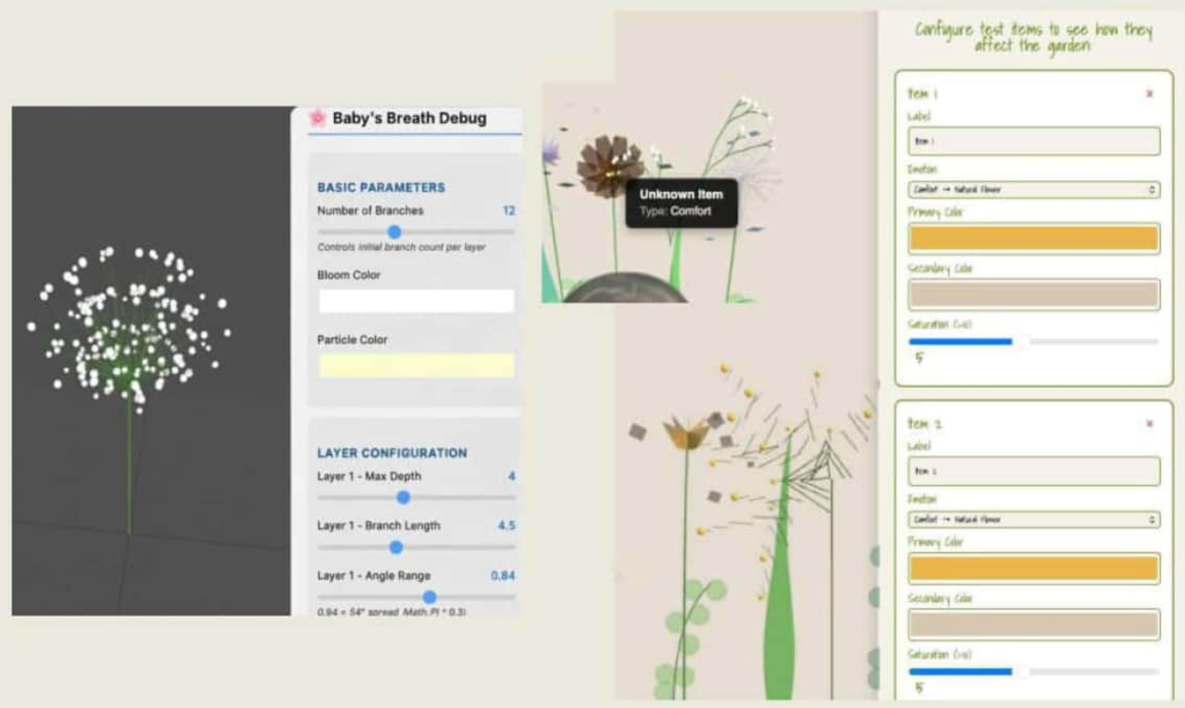
- Exposing intermediate steps to confirm the system's understanding before committing the result.

Designing While Building

Not all design decisions were made upfront. When design emerged during implementation, I paused to clarify the system's current state and asked the AI to propose a step-by-step plan before proceeding. This kept the process intentional rather than reactive, even while working intuitively.

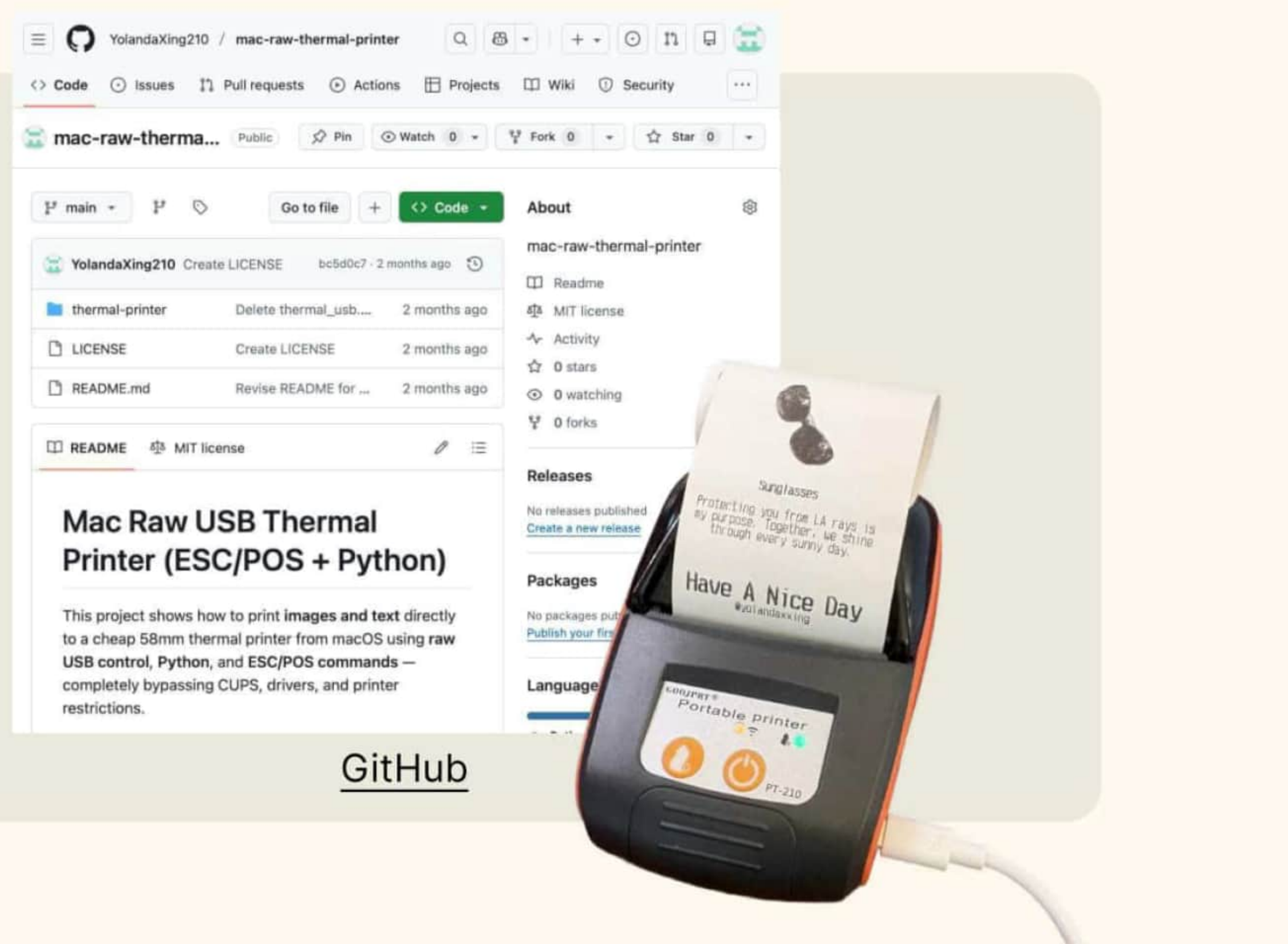
Fine-Tuning Through Visual Feedback

Fine-tuning purely through text proved difficult, especially in a 3D environment. To address this, I built internal debug panels and exposed adjustable variables directly in the scene.



Working with Mac

macOS does not natively support sending raw data directly to thermal printers, unlike Windows, which made precise receipt printing difficult. To address this, I implemented a workaround that bypasses the default macOS print pipeline and enables direct control over thermal output. The technical details are documented in my GitHub repository.



GitHub

Algorithmic Interpretation

Built with HTML5, CSS3, and vanilla JavaScript; AI communication via JSON APIs; all client-side processing

Tiled 2D flower field with infinite scrolling

7	8	9
4	5	6
1	2	3

3×3 Tile Grid

When camera moves beyond tile boundary, position resets

```
function checkAndResetCamera() {
    const boundary = TILE_SIZE / 2;

    if (cameraX > boundary) {
        cameraX -= TILE_SIZE;  // Teleport camera back
        camera.position.x = cameraX;
    }
    // Similar for Y axis and negative boundaries
}
```

Create clean, transparent PNG "stickers"

1. Base64 JPEG
2. Blob conversion
3. rembg.remove(blob)

→ **PNG with mask**

Alpha channel sharpening

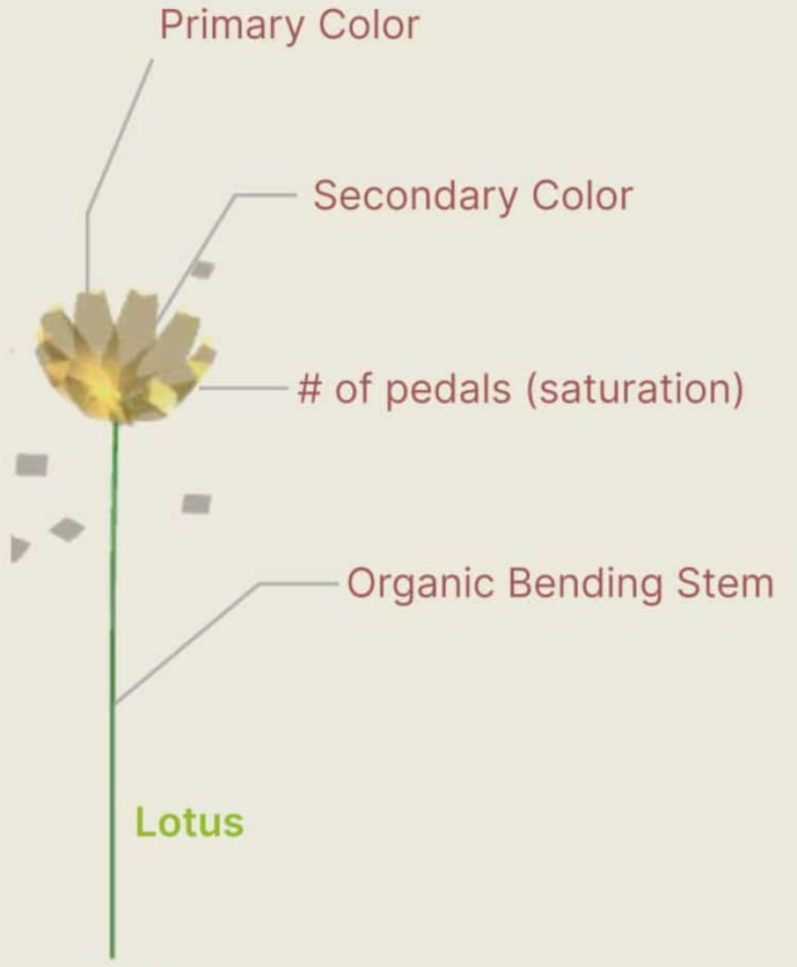
(ONNX Runtime + U^2-Net ML model)

~3-5 seconds per image

Both detection and background removal run simultaneously

```
const [detectionResult, cutoutImage] = await Promise.all([
    detectObjectWithGemini(capturedImageData),
    removeBackground(capturedImageData) // Blocks main thread for ~4s
]);
```

Procedural Flower generation in Three.js Environment



Procedurally generated based on flower type

Lotus & Tulip
Individual skinned petals with C-curve deformation

Wavy
Recursive 3D branching algorithm with Bezier curves

Baby's Breath
L-system inspired tree structure with clustered blooms

Infinite Garden
Input

rembg-web
Processing

Gemini 2.0 Flash
AI Processing

Flower Generation
Output

Printer Output
Final Output

Automatically identify objects, extract visual properties, and generate emotional impressions for a more emotional experience.

Camera Frame → Base64-encoded JPEG → Prompt with Gemini →

- Object Name
- Primary Color
- Secondary Color
- Saturation Value (1-10)
- emotional phrases

- Structured data (name/colors) → Used for flower generation
- Poetic phrase → Displayed during loading with typewriter animation

Mini Receipt Printer Prints Responses from Object's Perspective

USER : "*You keep me going through long days*"
WATER BOTTLE : "*I'm here for you, always ready. Your hydration is my purpose.*"

58mm ESC/POS thermal printer (PT-210) via USB API Endpoints:

- GET /health → Check printer connectivity
- POST /print → Print full receipt
- POST /test-print → Hardware validation

Outcome

Real-time interaction recognition
Web art and interactive actions
Installation Rendering
+WHATS IN MY BAG
+
order #000001
2026.01.03 - 17:28:48
NAME
TYPE
Lip Balm
Logitech Mouse
Perfume
Sunglasses
Comfort
Productivity
Expression
Comfort
TOTAL
qty: 4
Lip Balm
I may be small, but I see your beautythe real kind that shines from within. You're more alive than you think.
Logitech Mouse

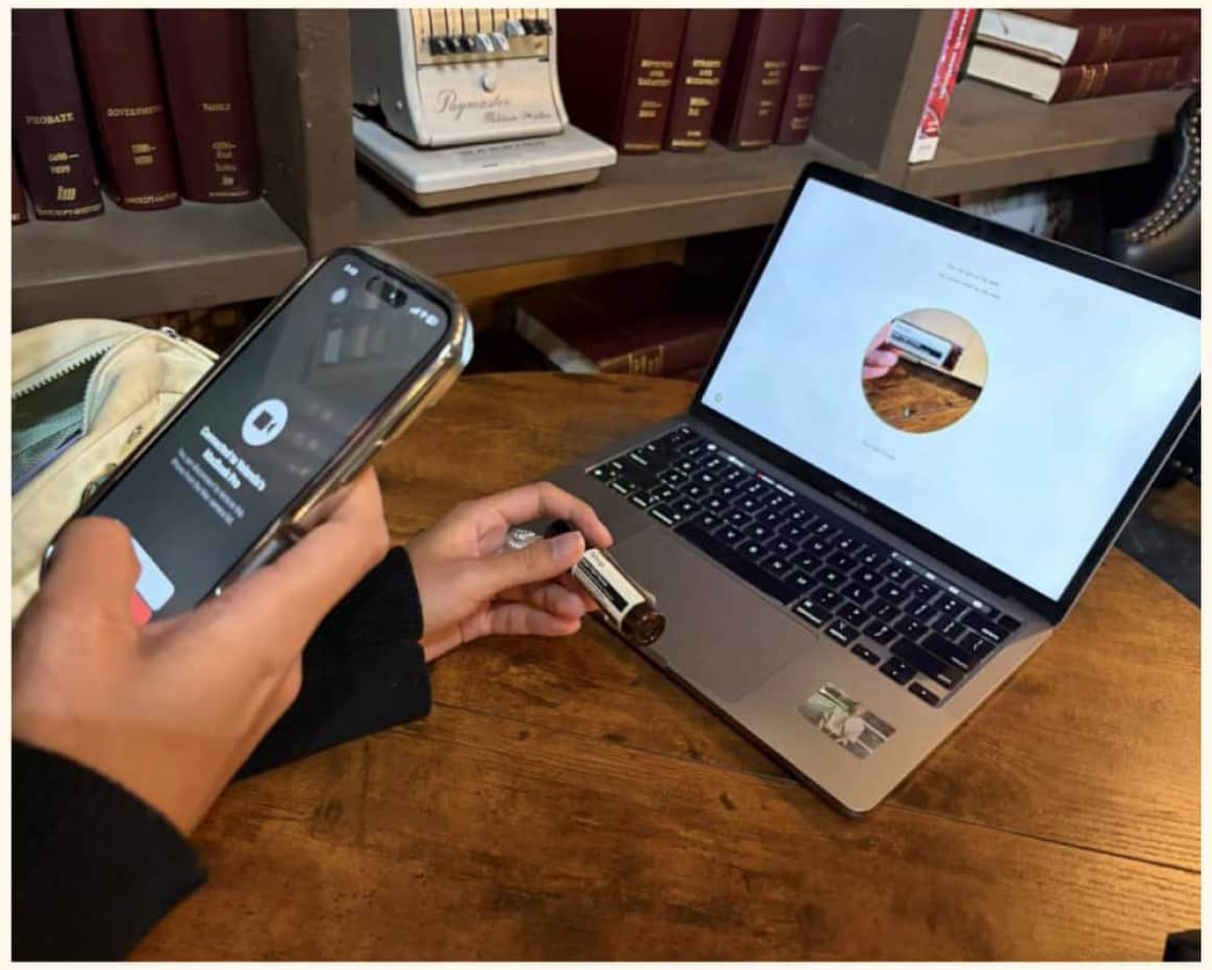
Phrase 1: Introduction
Begin with what you already carry. Place an item on the surface, hold it in the camera's frame, and let it be seen. Choose why you keep it close — not the object itself, but the intention behind it. Each choice becomes a seed. Each seed becomes a bloom. Move slowly, item by item, and watch your private landscape unfold.
capture
Phrase 2: Object Capture
Phrase 3: Bag Capture
Phrase 4: Bouquet Creation

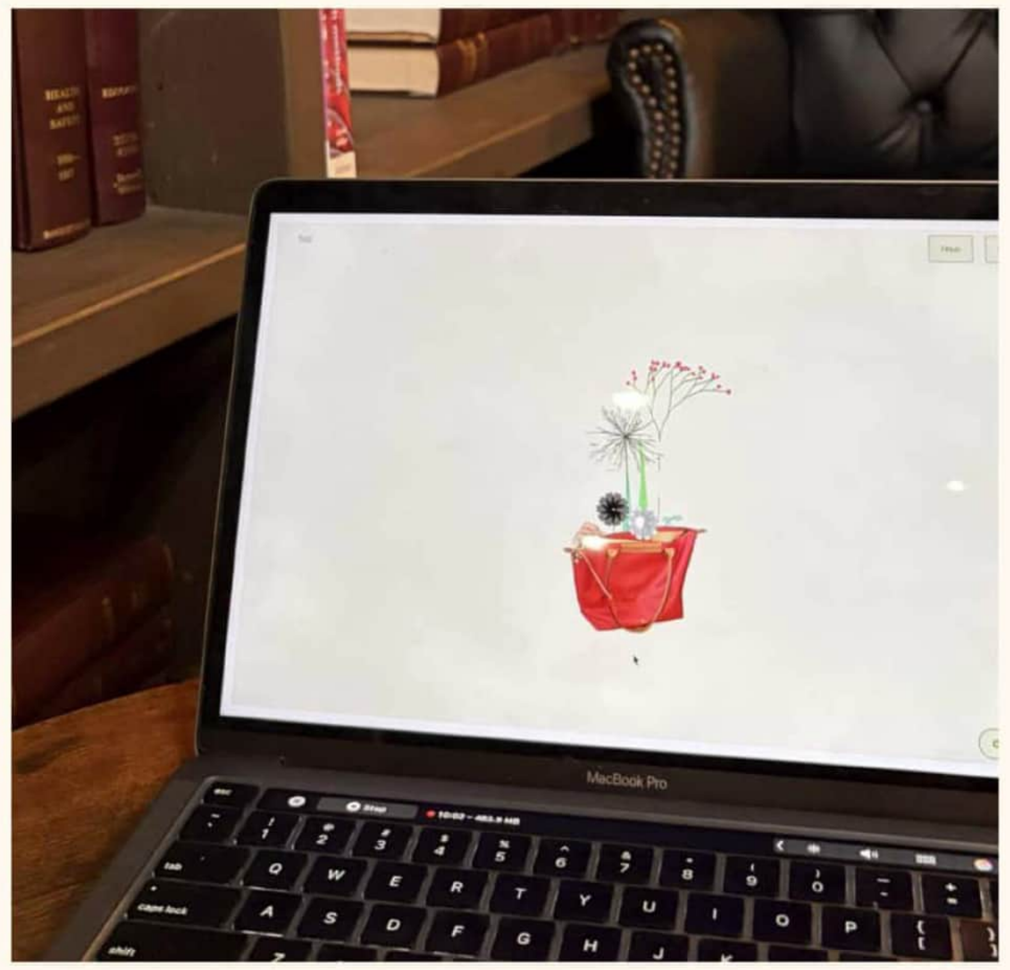
Click on flowers reveal detail

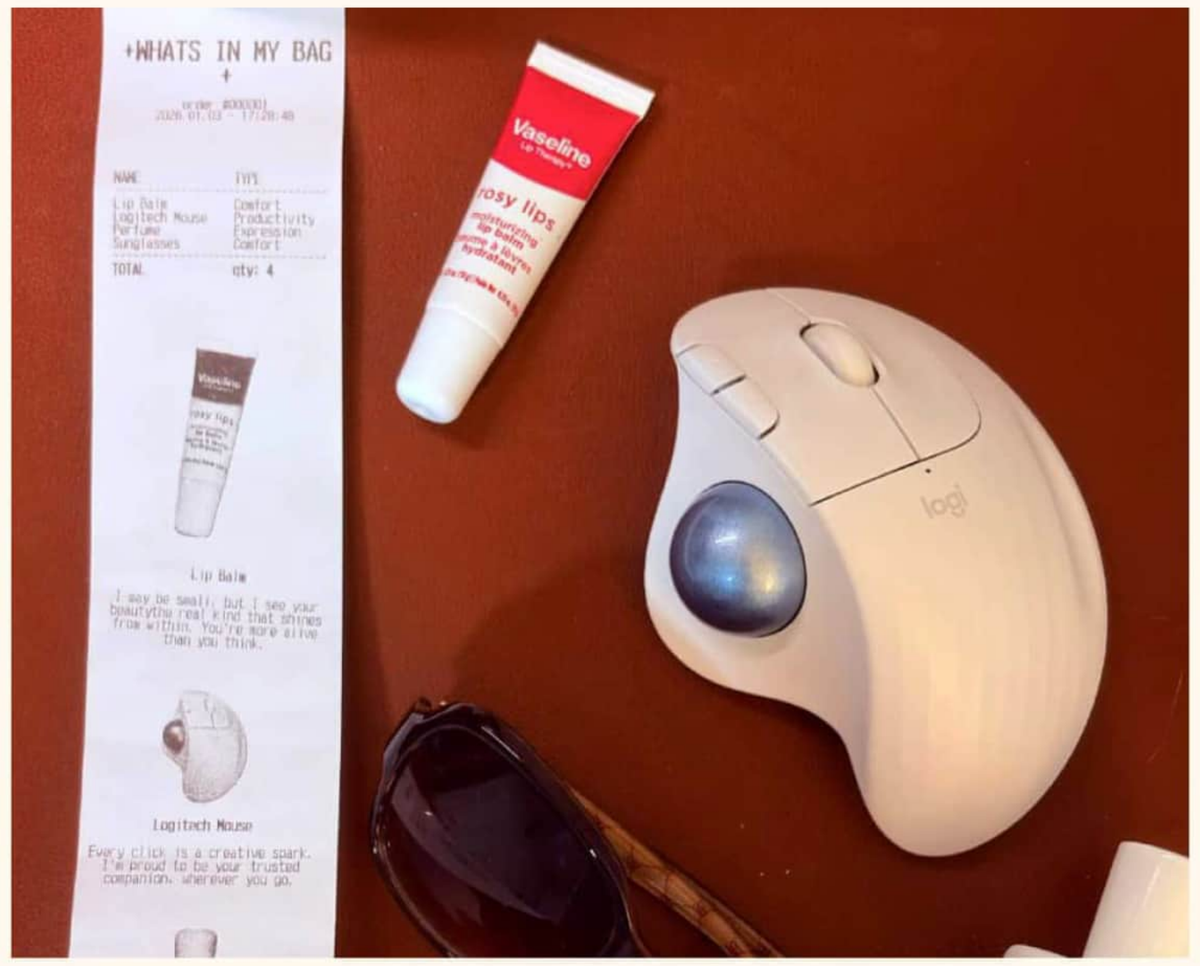
Installation
Bag
Bouquet
Thermal Printer

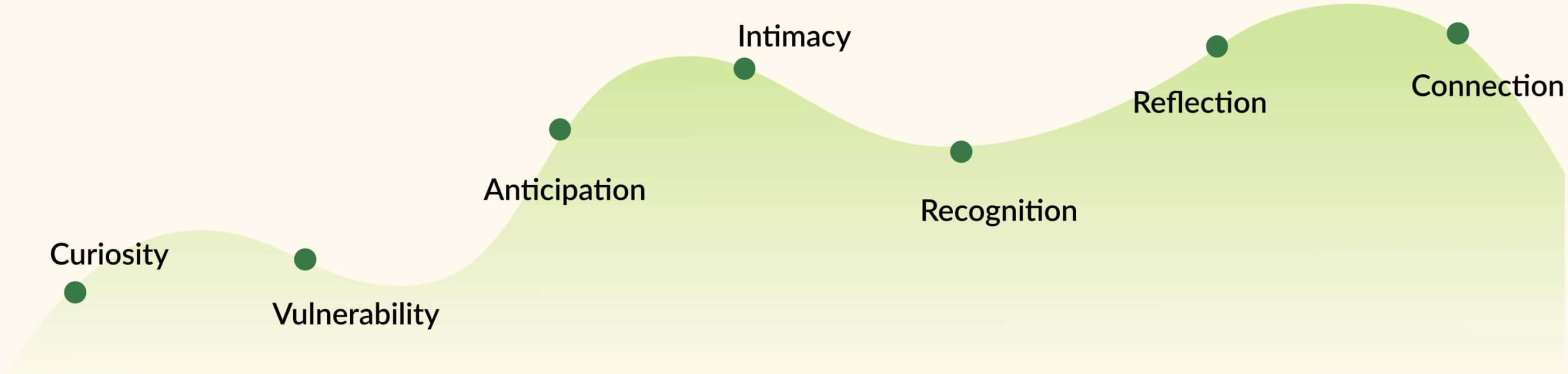
User Journey

Encounter & Invitation | Object Selection | Placement & Capture | Communication | Bag Capture | Bouquet Transformation | Takeaway Artifact









	Encounter & Invitation	Object Selection	Placement & Capture	Communication	Bag Capture	Bouquet Transformation	Takeaway Artifact
User Behaviors	• Notices installation • Reads short prompt	• Opens bag • Choose one object	• Places the object • Waits	• Writes short message	• Acknowledges bag as context	• See objects transform • Understands share space	• Receives a printed receipt
Touch Points	installation	Personal bag	Capture surface	Text input	Bag capture interface	Bouquet visualization	Thermal printer
Design Intent	Lower the barrier to entry by keeping participation optional and non-instructional	Encourage personal choice without implying a "right" object	Introduce slowness and pause to heighten awareness	Enable expression without requiring clarity or explanation	Acknowledge personal context without analyzing or exposing it	Visualize coexistence without hierarchy or comparison	Allow the experience to extend privately beyond the installation

Reflection

Coming from traditional coding, vibe coding reshaped how I build. It allowed me to focus on design decisions, pacing, and emotional intent rather than syntax. Building end to end made the system feel alive, and watching friends respond emotionally confirmed that softness, structure, and technical authorship can coexist.

Future Step

Expression Enhancement Plan

Computational and Interaction System Expansion

1. Expanding the emotional inference
2. Integrating AR for spatial bloom

Conceptual Enhancement Plan

Collective, Temporal, and Material Experience

1. Building a collective digital garden
2. Deepening the tactile artifact
3. Longitudinal interaction