Traverse:
Sketching and Low-fi Prototyping

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Team Members

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M.S. COMPUTER SCIENCE (HCI)
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(DMAR)

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B.S. COMPUTER SCIENCE (AI)

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B.A. ECONOMICS
M.S. COMPUTER SCIENCE (HCI)

Agenda

Introduction

About Us

Traverse

EXPLORE. CONNECT. CREATE.

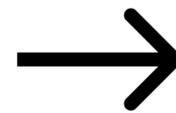*Traverse*: where creatives find *wonder* in their artistic experiences through open-ended exploration and reflection.

Problem/Solution

Problem

As digital spaces for arts engagement prioritize consumption over emotional depth, **casual creatives** struggle to find:

- **Trust** in new communities
- **Fulfillment** and **wonder** when exploring the artistic world
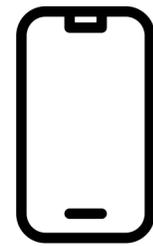
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Solution

An AI-powered platform for users to **explore** the connections between artworks and add their **reflections** – deepening artistic engagement and jumpstarting curiosity
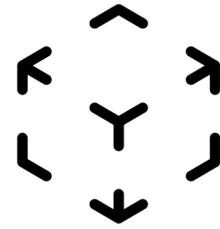
Sketching Explorations

Concept Sketches
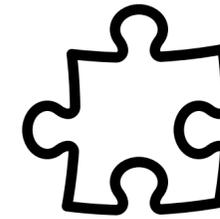
App

VR/AR

Game

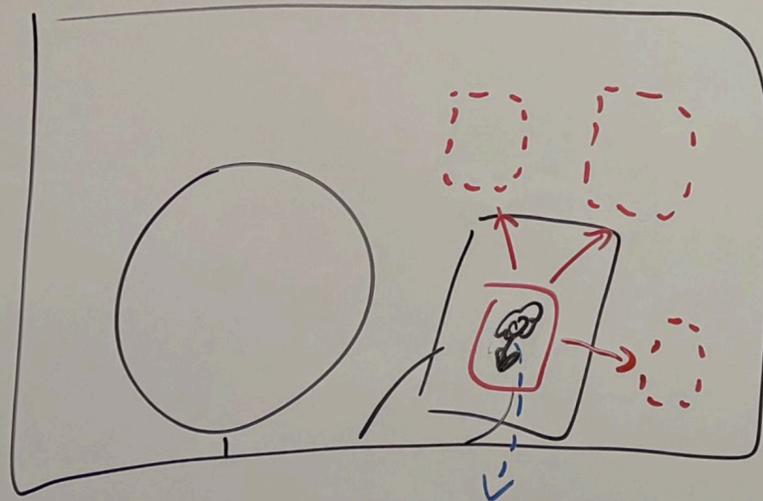# Concept Sketches: App

(a) Drag to explore feature
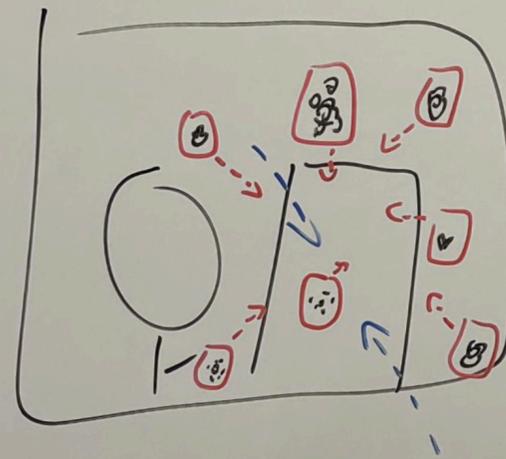
(b) Zoom in/out to explore feature
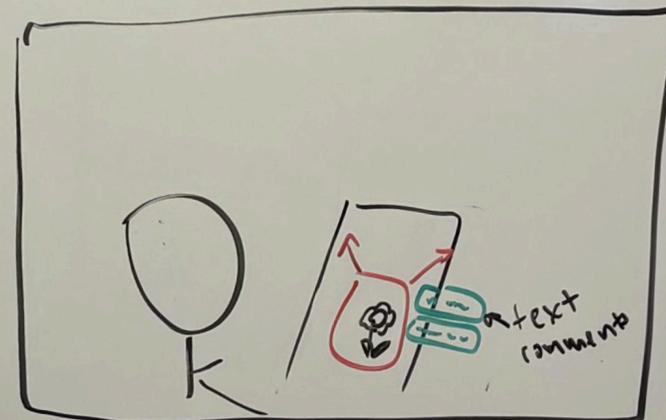
(c) Commenting feature
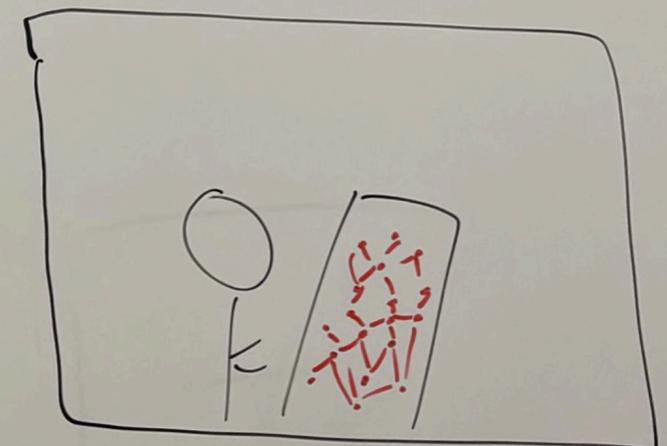
(d) Full 'zoomed out' constellation of connections!

Concept Sketches: VR/AR

Concept Sketches: Game
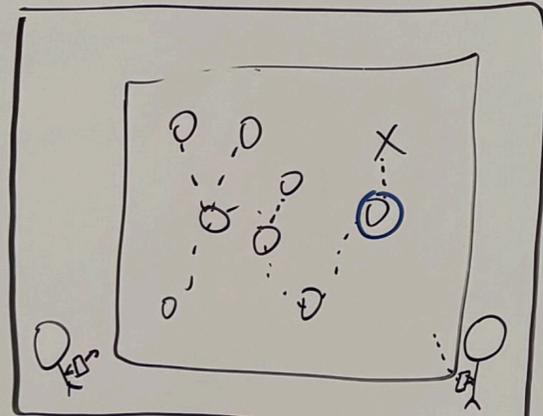
(a) high level 'map' of different art
selects one location
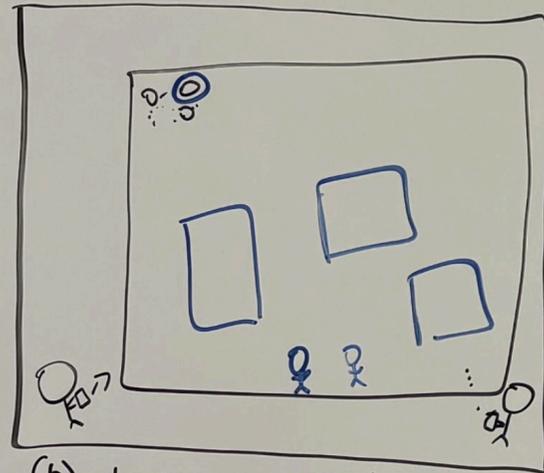
(b) drops into that location
sees art related to that
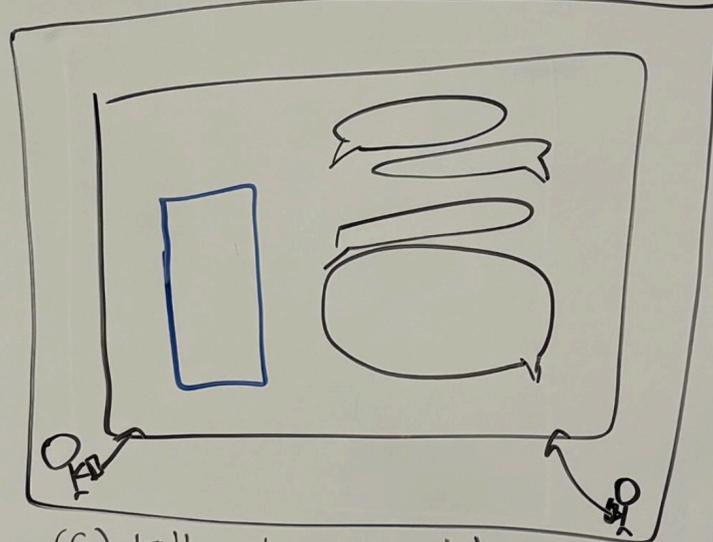
(c) talk about art!
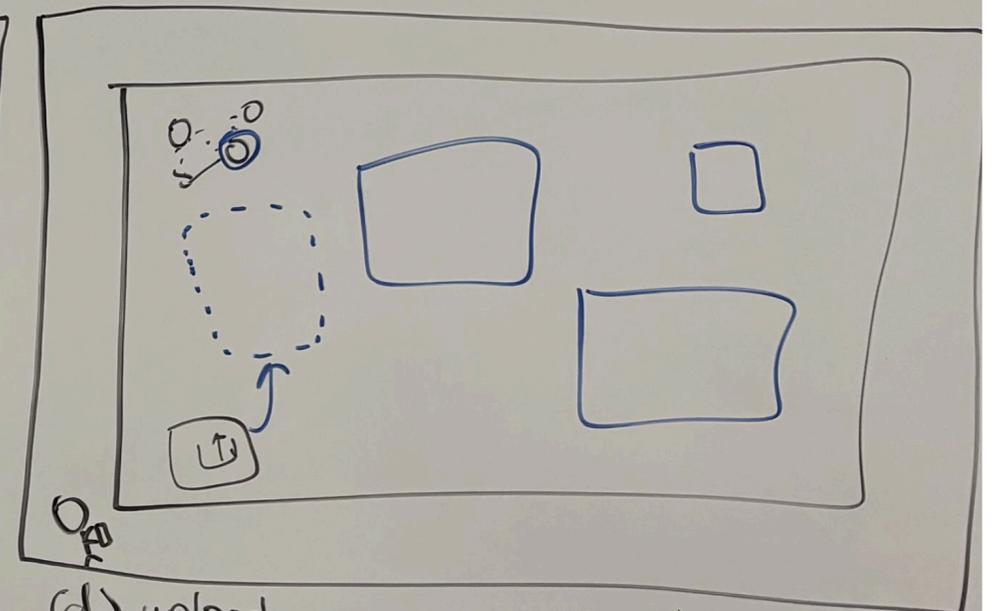
(d) upload your art into virtual gallery

Interface Selection

Concept Sketches

App

VR/AR

Game

Concept Sketches

App
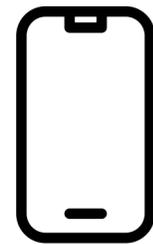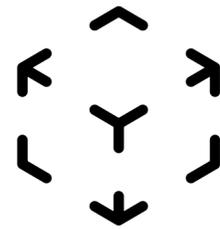
VR/AR

Game
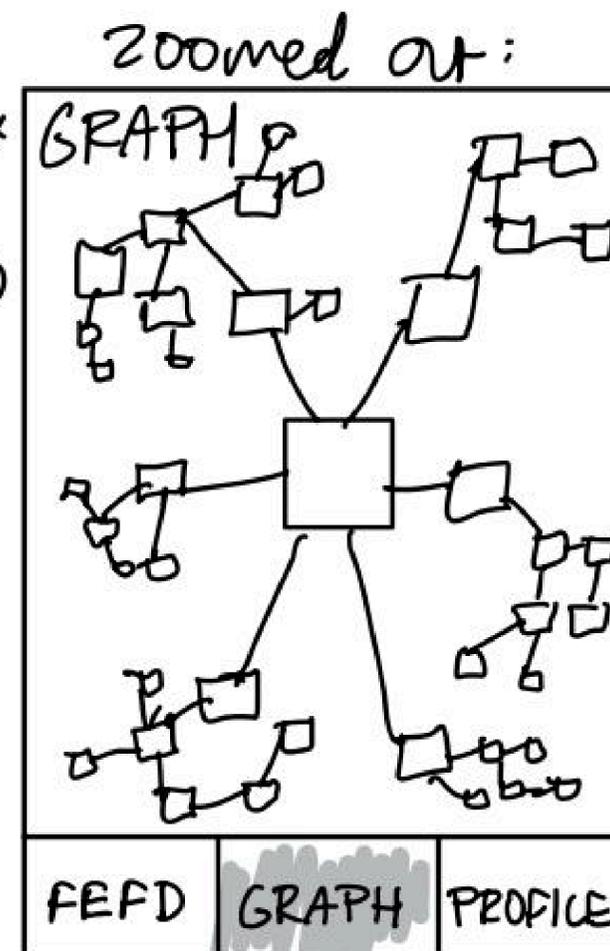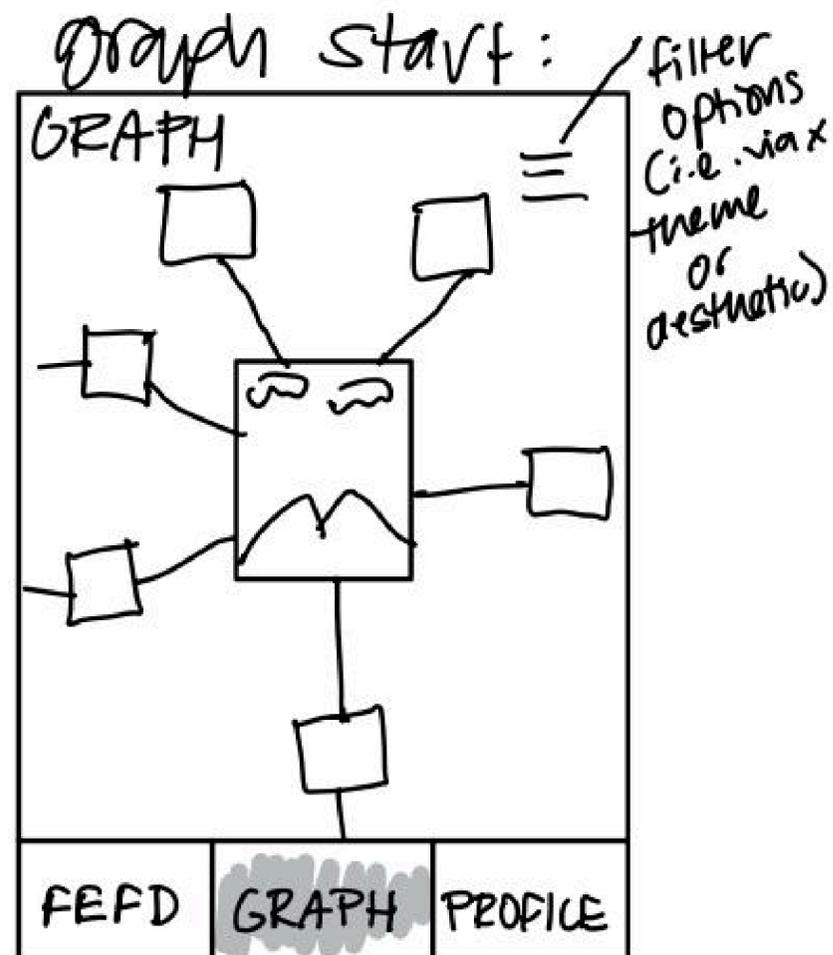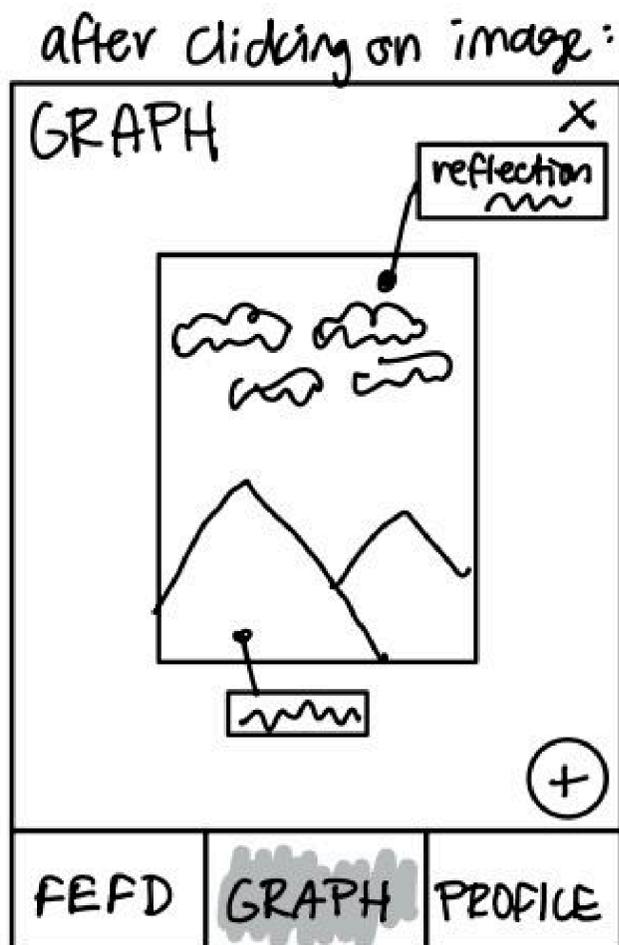
App Key Screens (1/2)

App Key Screens (2/2)

discourse feed:

FEED

@ POST

@ POST

⊕

FEED | GRAPH | PROFILE

user (photos):

USER
BIO

COMMENTS PHOTOS

⊕

FEFD | GRAPH | PROFILE

user (comments):

USER
BIO

COMMENTS PHOTOS

⊕

FEFD | GRAPH | PROFILE
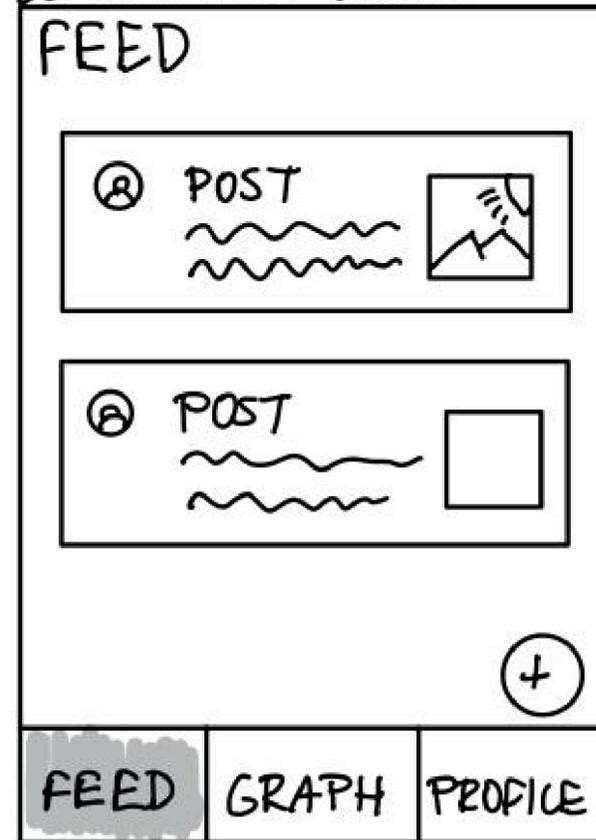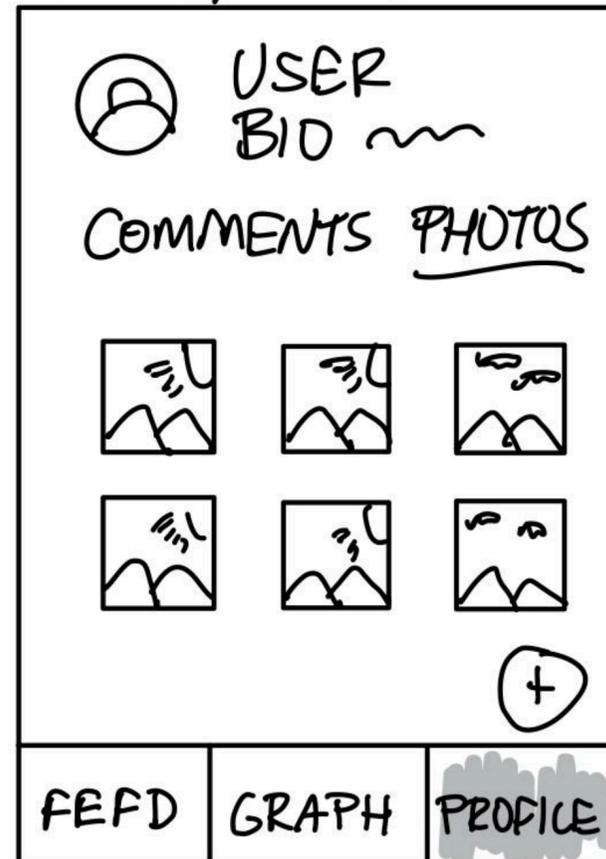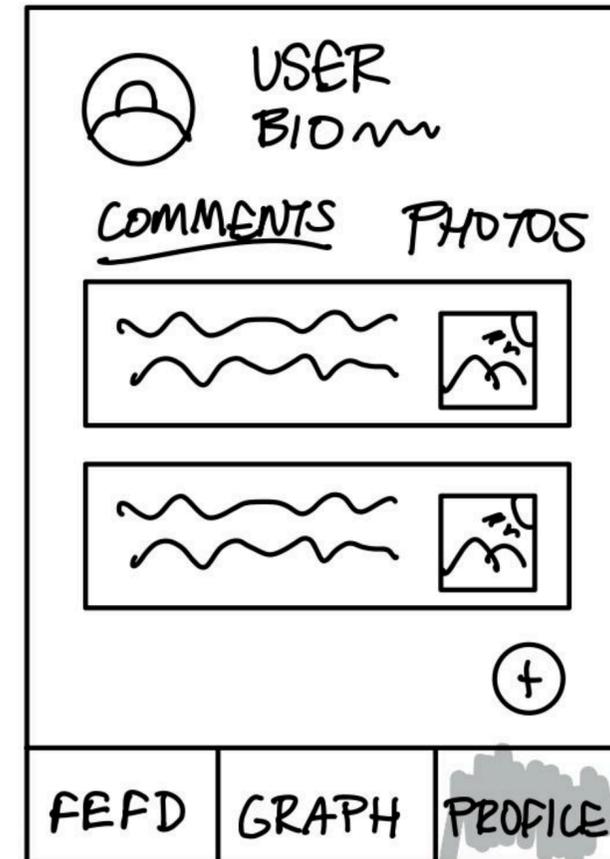
App Tradeoffs

Pros

- **Accessible**: many people have phones, which can help us build a larger user base to power the social interaction
- Phone UI paradigms (swipe, zoom in/out, etc.) are familiar and **intuitive** for interacting with the app

Cons

- Screen might be too **small** to visualize dense art maps
- **Less novel** and differentiated from other competitor apps (Instagram, Pinterest, etc.)

AR Interface Key Screens (1/2)
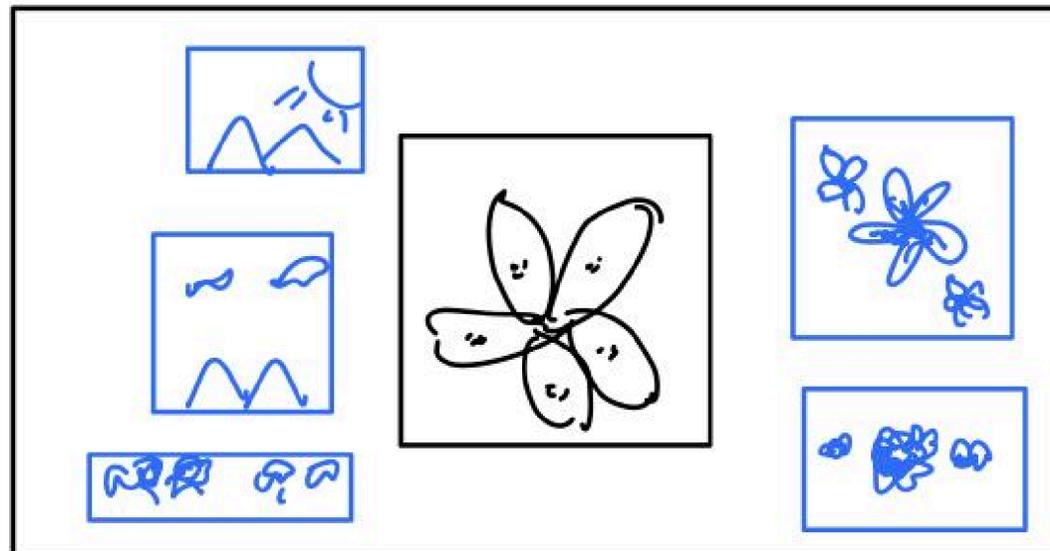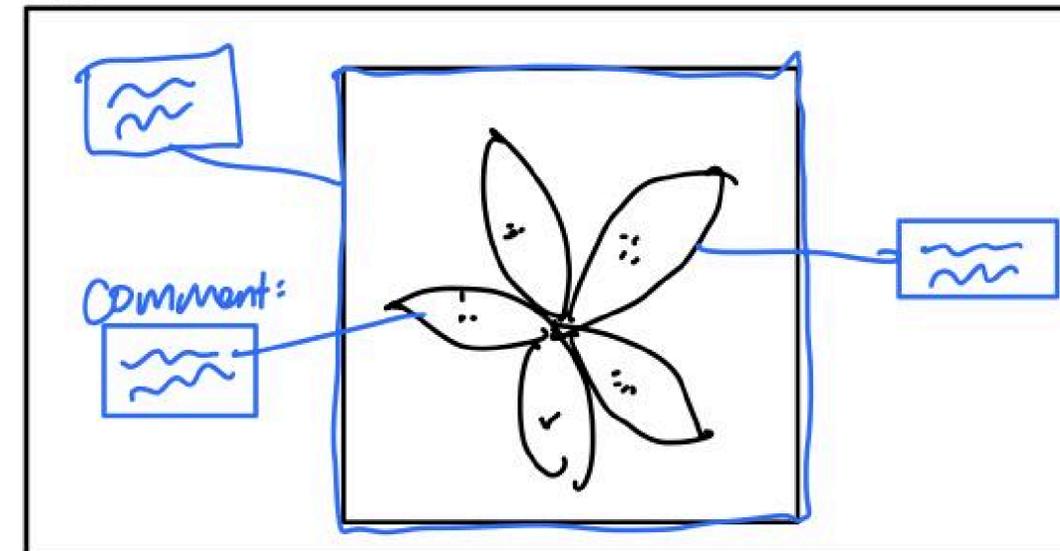
AR Interface Key Screens (2/2)
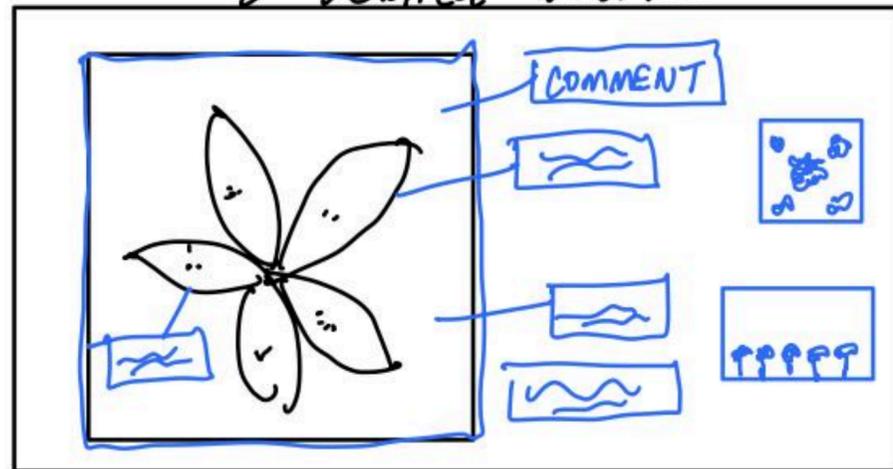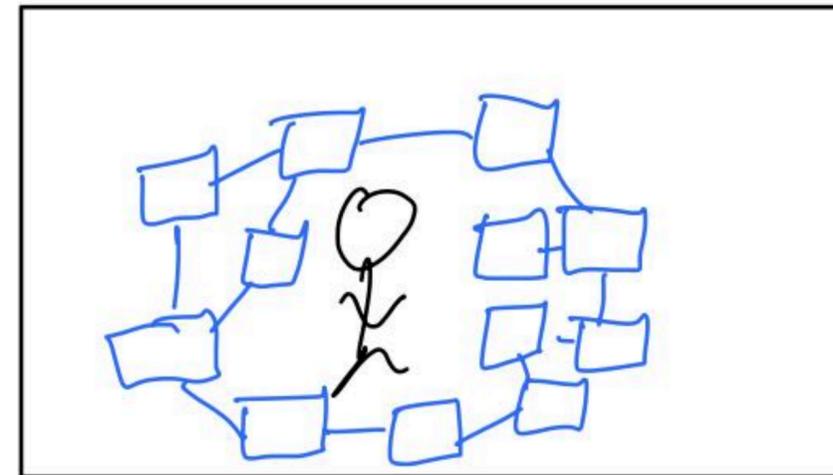
AR Interface Tradeoffs

Pros

- **Immersive**: feels immediate, visceral, and real for more engagement and larger visual field
- **Novel** and interesting to people who may not be normally exposed to AR

Cons

- Financially **inaccessible**, especially for our target user group (creatives)
- **Low adoption** makes it difficult to get a substantial user base for meaningful social interactions

Concept Sketches

App

VR/AR

Game

Why App?

- Meets the needs and preferences of our **target user group**
  - More **accessible** (financially + to more communities) and **well-adopted**
  - Build larger user base from high mobile adoption for more value from **social interactions**
- Supports **more complex interactions** from familiar and intuitive UI (annotating visually and through text, navigating to different works)
- More **technically feasible** – team has ready access to mobile devices, as opposed to only 1 potential VR device
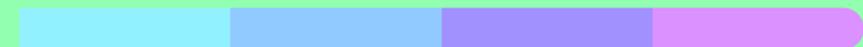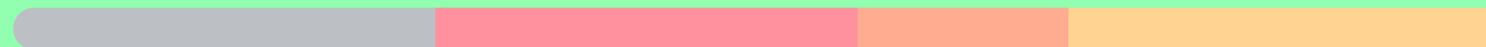
Low-Fi Prototype

Construction

Process and Operations

- Prototype drawn on iPad and printed on paper
- Utilized overlays and pop-ups for user feedback
- User interactions were manually handled by a computer (Samuel)
- Utilized a testing script to ensure a consistent testing experience

Low-Fi Prototype
Simple Task:

Traverse the graph by:
1. Focusing on a work
2. Viewing existing comments
3. Adding your own comment.
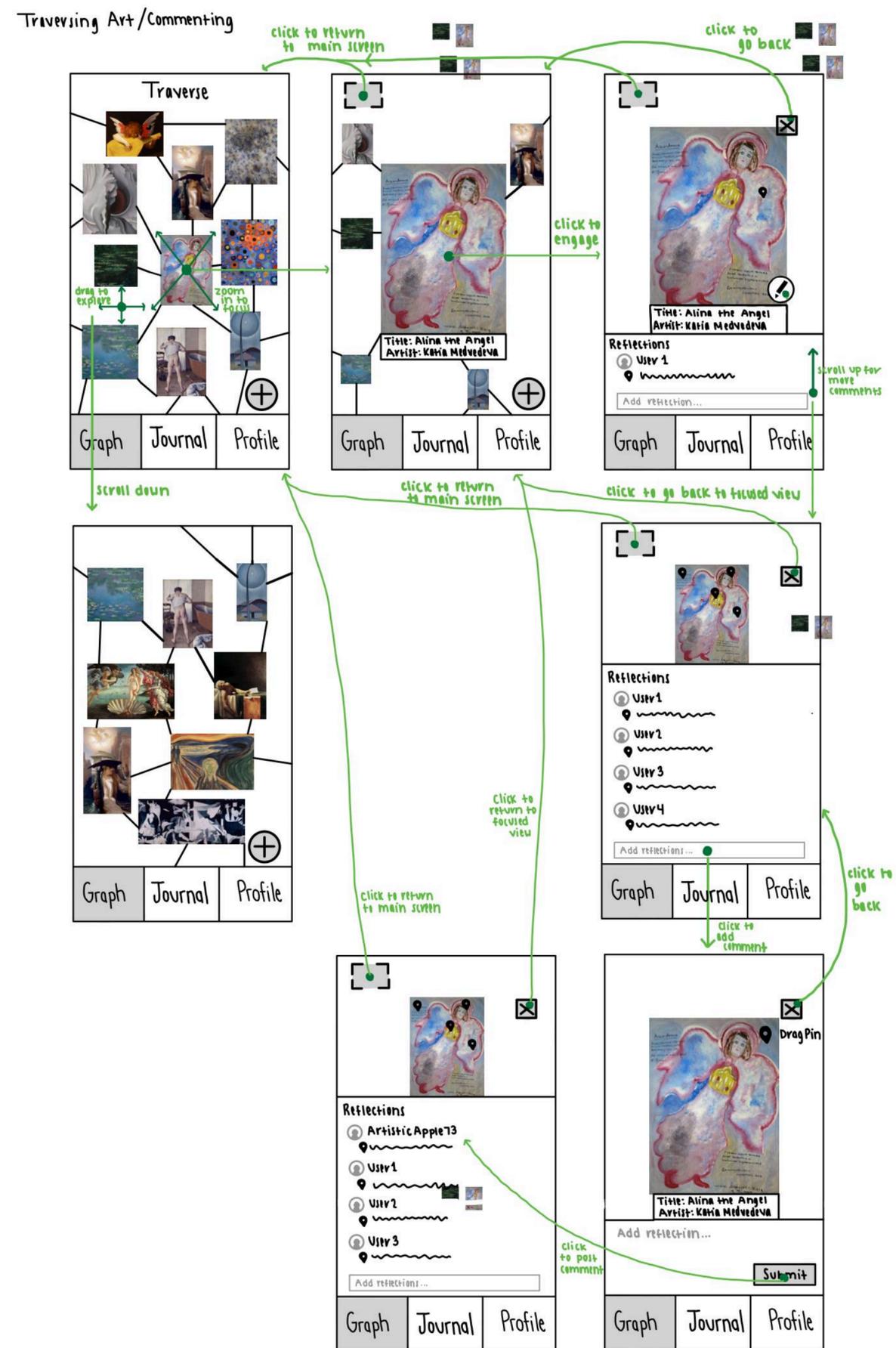
Low-Fi Prototype
Moderate Task:

Engage further with works by adding personal visual annotations to your Journal (previously Feed); how does this piece inspire you?
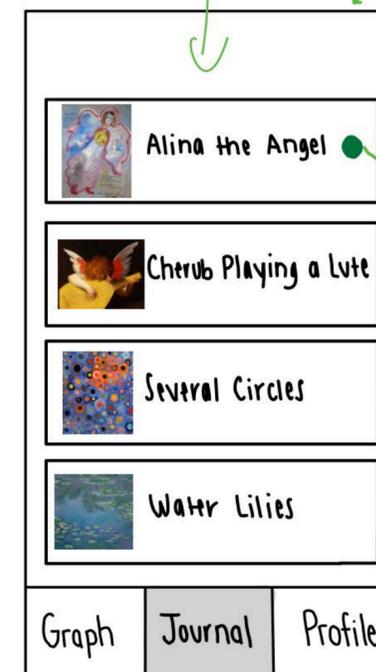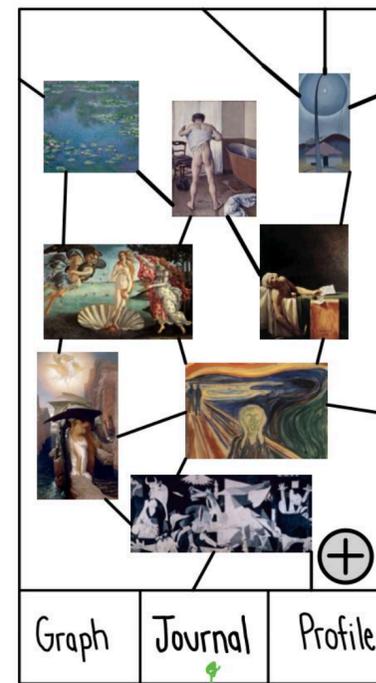
Complex Task:

Add art to the platform that you see or create in your personal art experiences!

Uploading Art

Traverse

click to return to main screen

click to start uploading

Browse Files

Title ...

Artist...

Description...

Submit

Click for AI to add image into graph

Loading ...

Graph | Journal | Profile

Graph | Journal | Profile

Graph | Journal | Profile

click to return to main screen

updated graph

Title: Sunflower, New Mexico
Artist: Georgia O'Keeffe

Graph | Journal | Profile

Construction

Task List

1. **Find and open** the art piece with the angel

2. Figure out what **other people have said** about the angel piece

3. Leave **your own reflection** on the piece

4. **Annotate** the angel art piece and save it to your journal

5. **Upload** your own piece of art to the graph

Construction

Pages, Features, and Interactions

- **Graph:** drag/scroll to explore the graph, view artwork details, and read and contribute annotation comments
- **Journal:** see and create personal annotations on works
- **Add artwork page:** upload image, add details (title, description, etc.)
- **Profile:** manage administrative actions

Testing Methodology

Participants
- Recruited through appointments and on-site
- Non-Stanford students who were interested in art
- No compensation, asked upfront for 20 minutes of their time

Environment
- Tested at the Cantor Museum on Stanford's campus

Apparatus
- Paper prototype with manually swapping to respond to user actions
- Utilized script for consistent testing among participants (see Appendix)

Procedure
- Gave background on class, project, and expectations
- Gave tasks one by one and had them complete without clarification
- Asked for qualitative feedback on intuitive steps and points of friction

Roles
- Facilitator: Michelle, Katherine
- Computer: Samuel
- Notetaker: Saniya

Testing Methodology

Stephen

EXTREME USER

Brennan

CASUAL ART ENTHUSIAST

Miles

DIGITAL MEDIA SPECIALIST
AT CANTOR

Maria

CURATOR AT CANTOR

Low/casual engagement with art

High engagement with art

Usability Goals and Metrics

- **Efficiency:** time to complete each task
  - Assesses friction against users achieving their goals
  - Success: <45 seconds/task, indicates streamlined process
- **Efficiency:** number of misclicks
  - Ensures that novel interaction patterns are still intuitive
  - Success: <=1 misclick/task (excluding non-implemented screens) indicates overall efficiency

- **Intuitiveness:** ease of use (scale of 1 to 7, with 1 being most intuitive)
  - Assesses positive experience and interest in adoption
  - Success: <3 indicates decisively intuitive
- **Satisfaction:** likelihood of actually installing the app (scale of 1 to 7, with 7 being very likely)
  - Assesses positive experience and interest in adoption
  - Success: >5 indicates decisively positive/likely
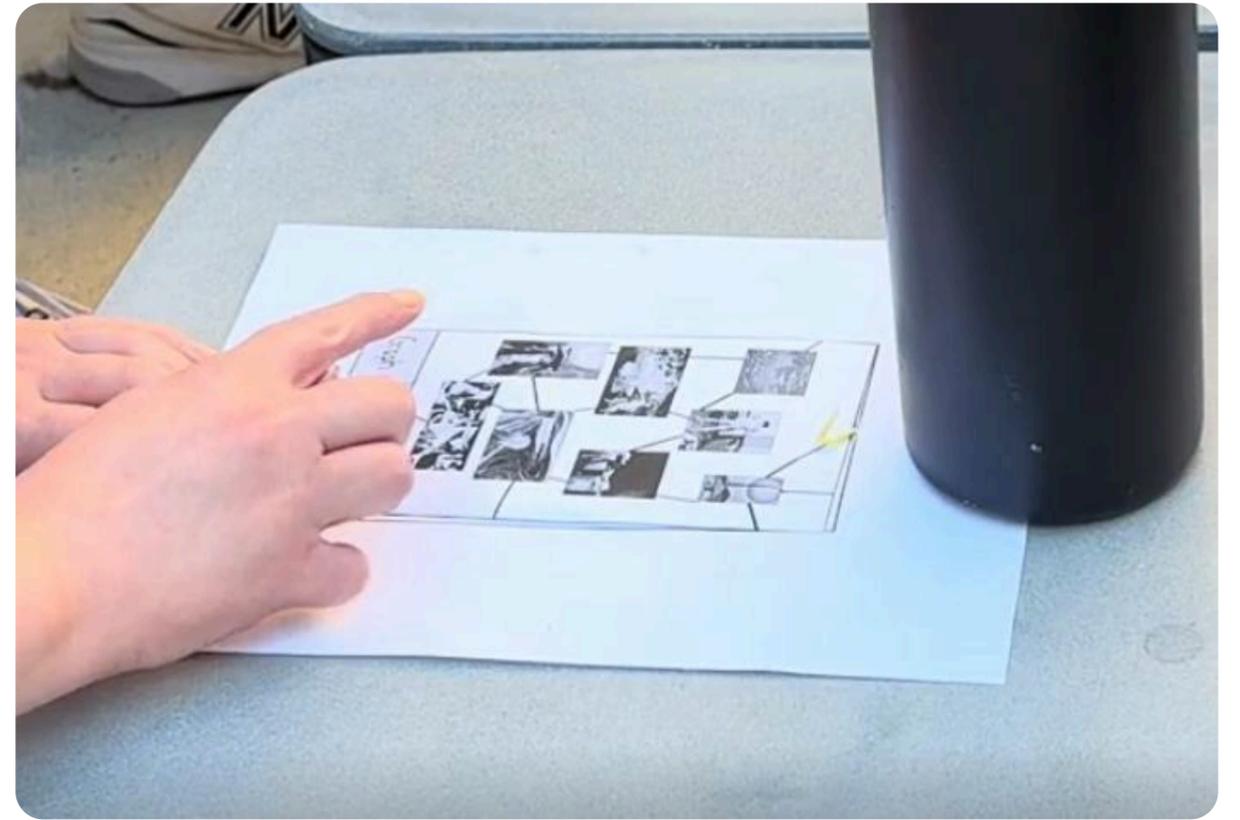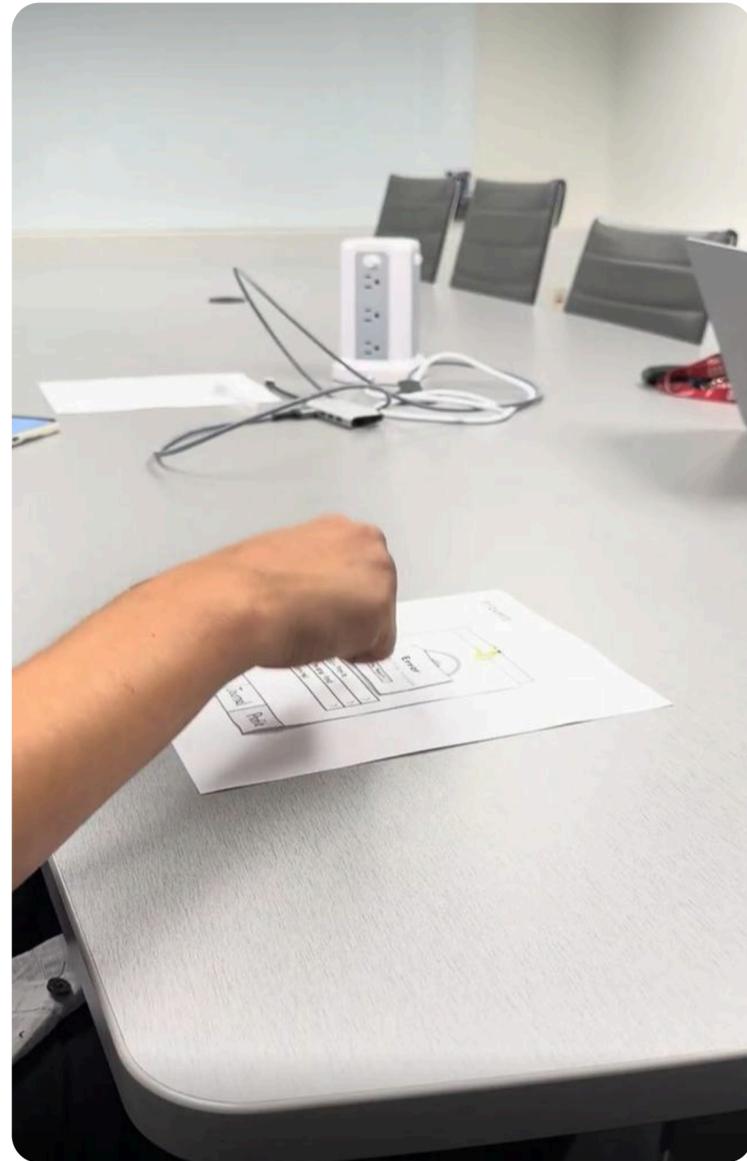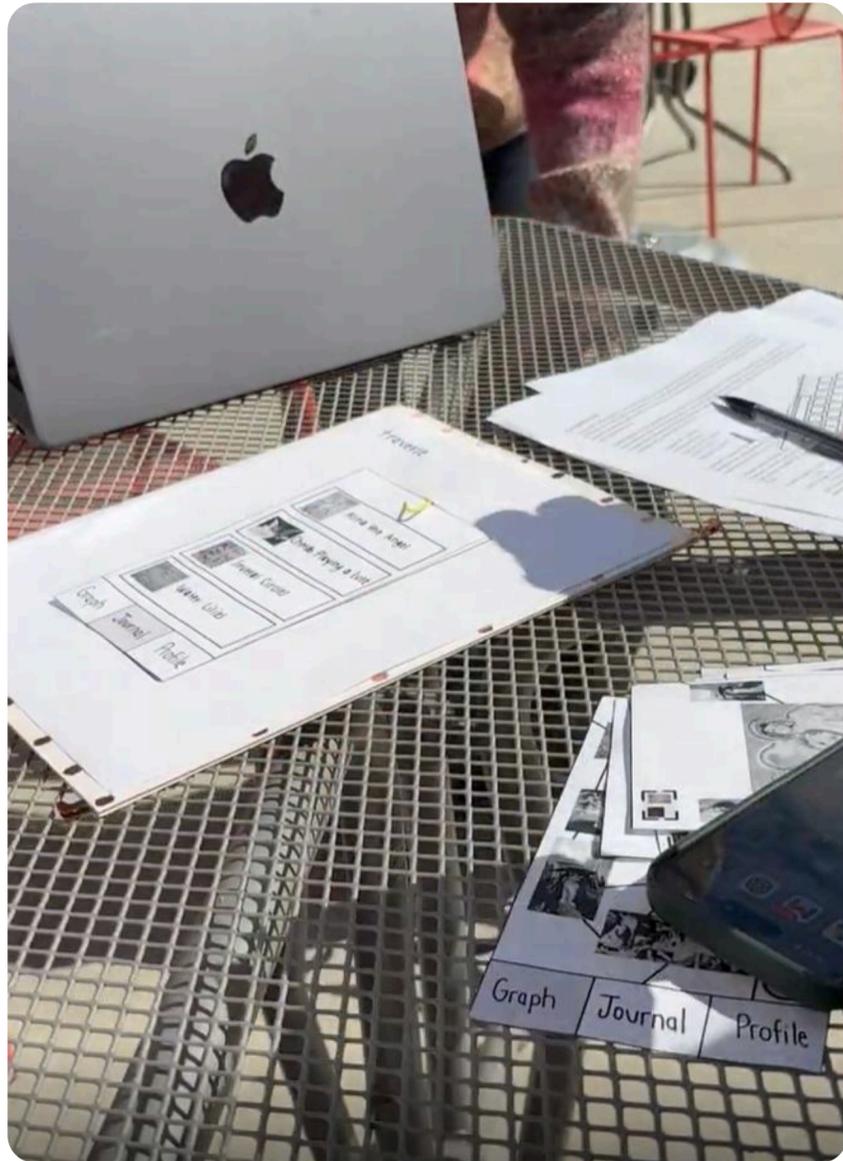
Testing

Discussion
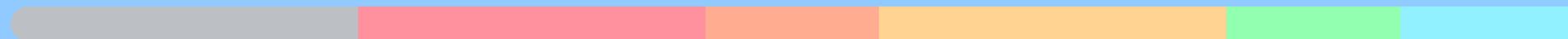
Testing Results

- At a high level, participants generally seemed to **understand the graph UI**
  - However, many participants were confused about the distinction between comments and annotations

- **Validated** interface UI's:
  - "Swipe up" to view more comments
  - Intent of "add artwork" floating action button on graph

- Between interviews, we changed screen interaction to require users to scroll on the simple graph to complete the task, rather than being able to immediately click on a work

Testing Results

- Efficiency: misclicks (average):

Task 1	Task 2	Task 3	Task 4	Task 5
3.75	1	0	0.25	0.75

- Efficiency: time spent (average):

Task 1	Task 2	Task 3	Task 4	Task 5
2m:23s	0m:36s	0m:33s	1m:12s	1m:15s

- Intuitiveness and satisfaction (average):

Ease (1: easiest, 7: hardest)	Likely to install (1: least, 7: most)
2.375	5.25

Testing Results

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5. **Upload** your own piece of art to the graph

Insights and Implications (1/3)

- Unify **comments and annotations**, and **remove the Journal page** (too confusing for users)
- Focus efforts instead on:
  - Robust **spatial comment system** (specific location in image)
  - Add an AI-based **segementation comment system** (foreground, background, etc.)

Insights and Implications (2/3)

- Users rarely pinched to zoom in, opting to click on works instead
- This means that users missed the contextual view, preventing them from being able to traverse node-to-node
- Potential solutions
  - **Start graph zoomed out** with works visibly smaller, encouraging users to zoom in to better see works
  - Modify **click behavior to transition to contextual view** instead of focused view

Contextual view
(zoom)
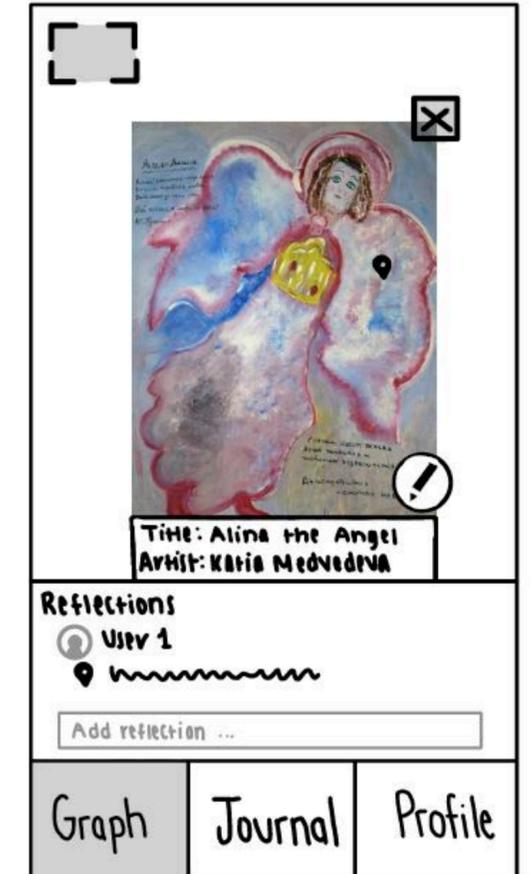
Focused view
(click)

Insights and Implications (3/3)

- **How much personal connection** is actually being encouraged with this current paradigm?
  - While people can interact with each others' comments, the **platform is less conducive to long-lasting interactions**
  - Even meaningful, nontrivial interactions would be **directed towards a broader community**, rather than a **focused, tight-knit group** (which initial interviewees in previous assignments desired)
  - This is **not particularly measurable** via usability test

Next Steps
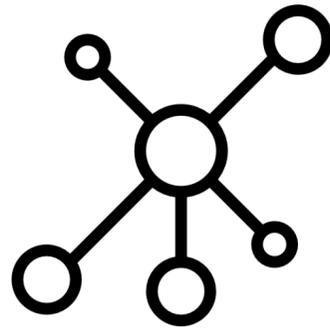
1

Consolidate design to unify of comments and annotations

2

Change app behavior to make switching between "contextual view" and "focused view" more intuitive

3
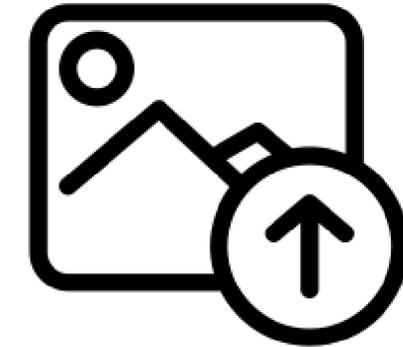
Create solidifed medium fidelity prototype in A6

Questions?

Appendix

Concept Sketches

Solution Ideas

Solution Ideas: App (Selected)
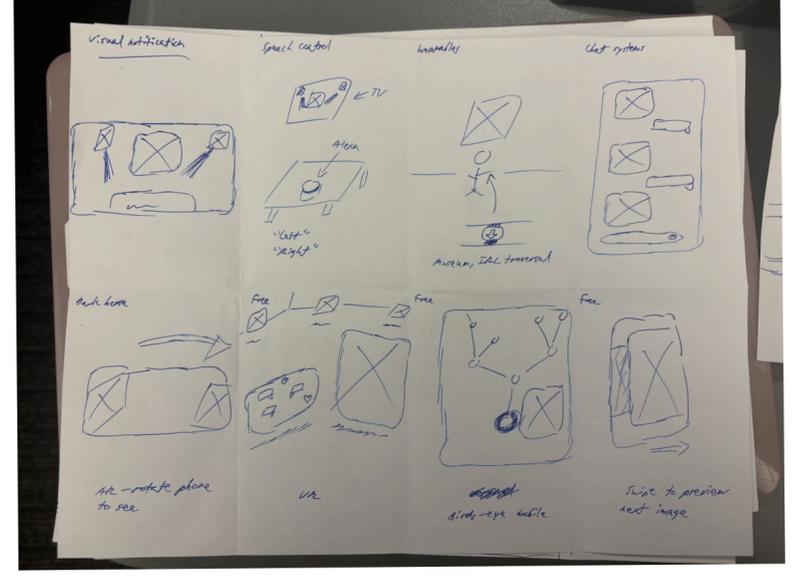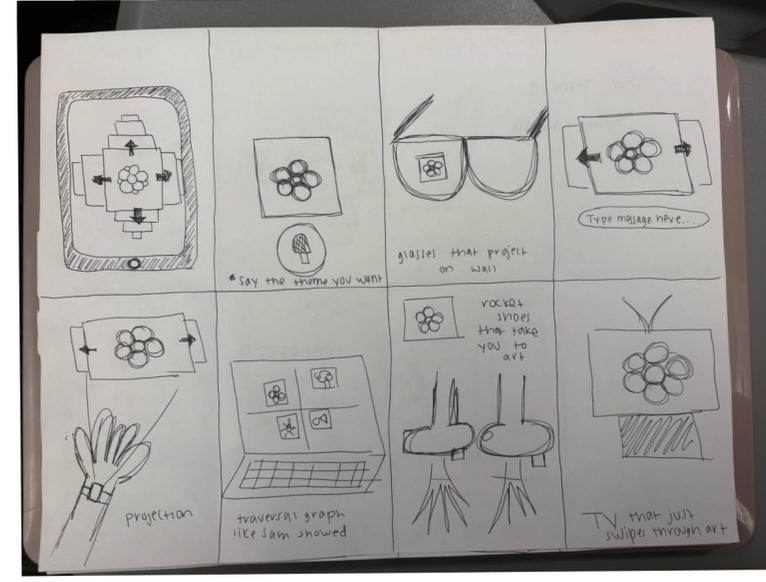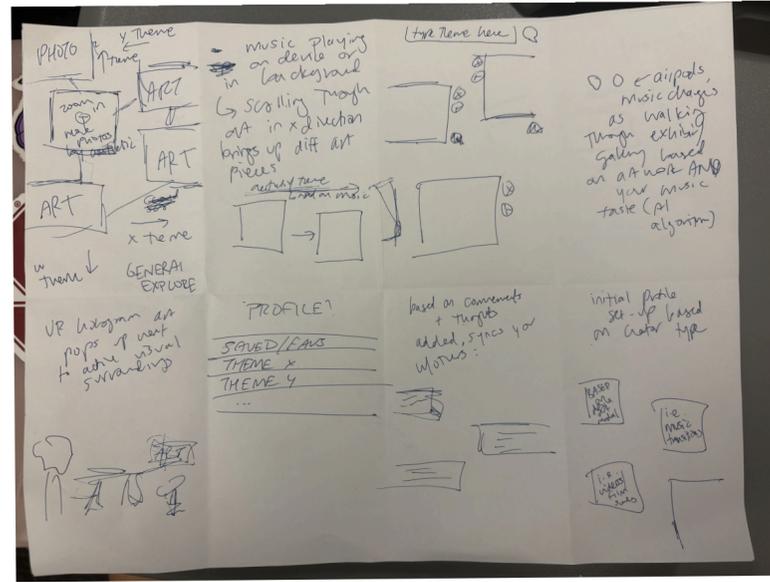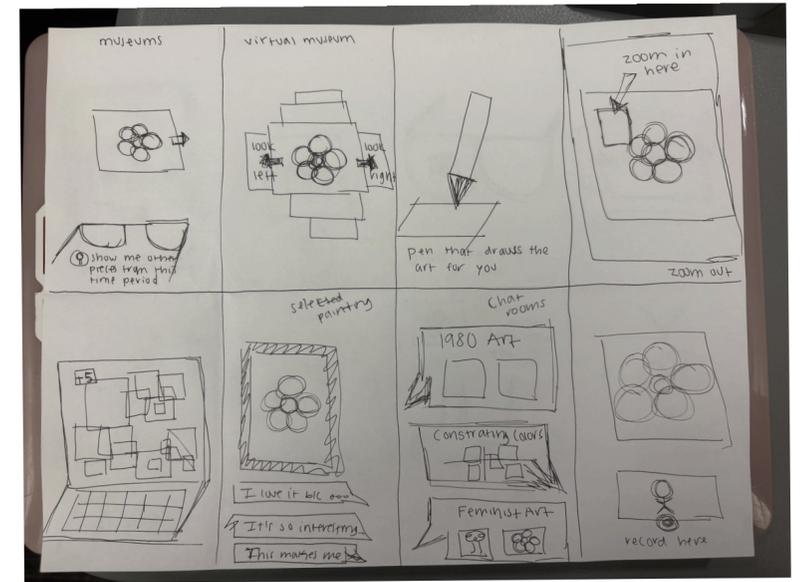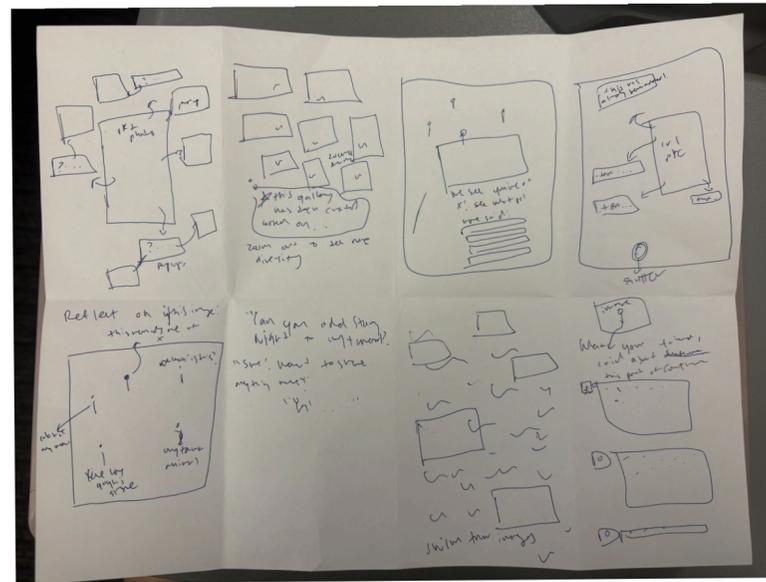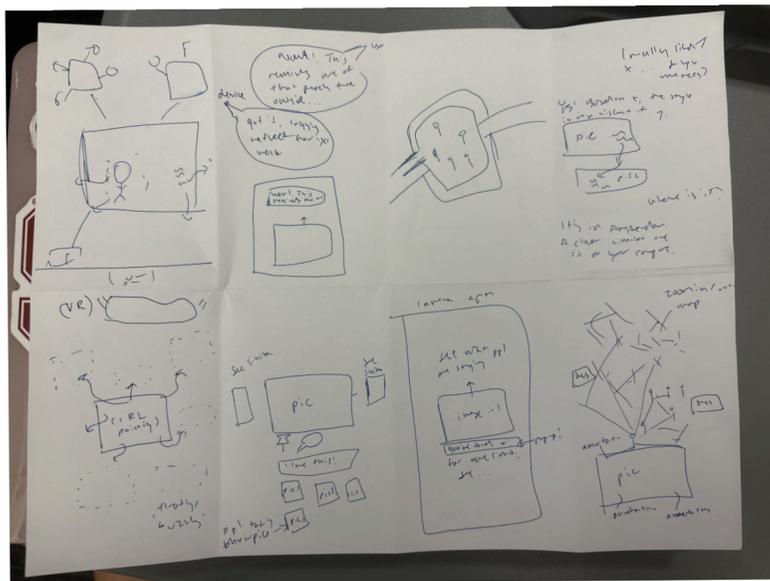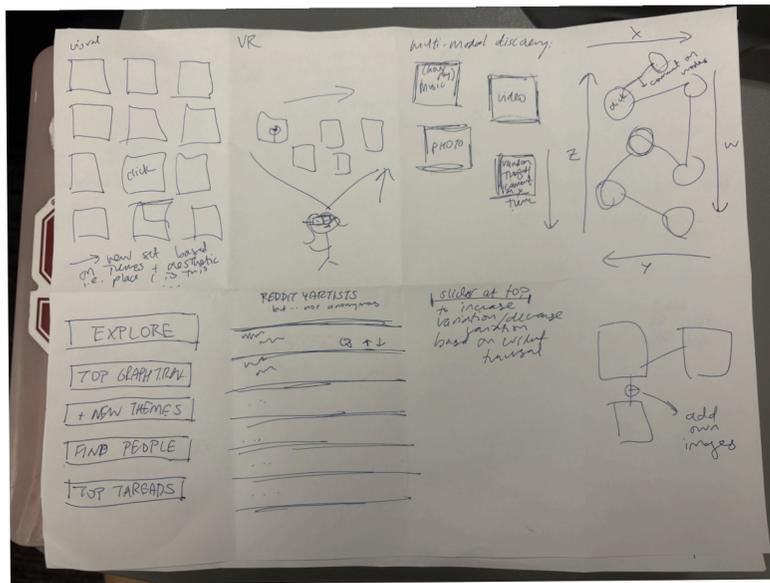
Solution Ideas: AR/VR
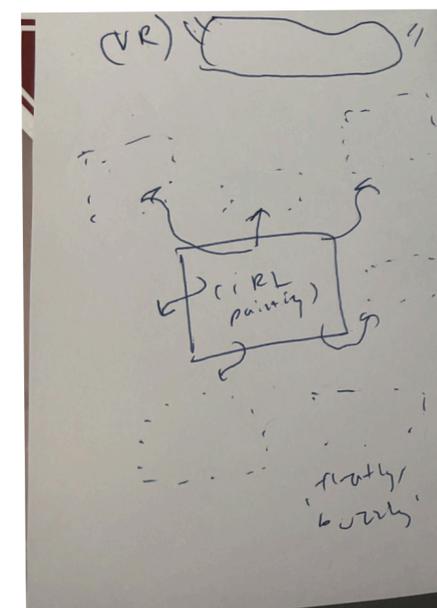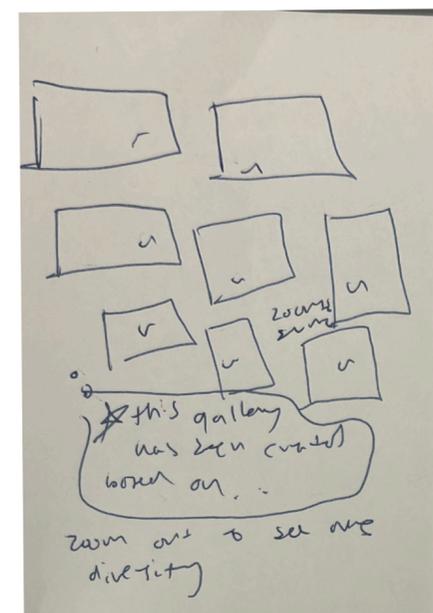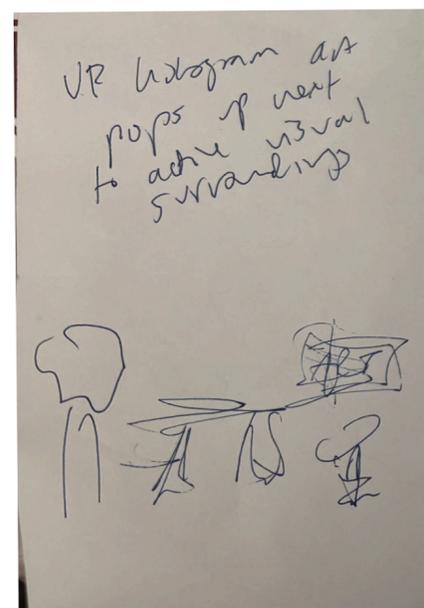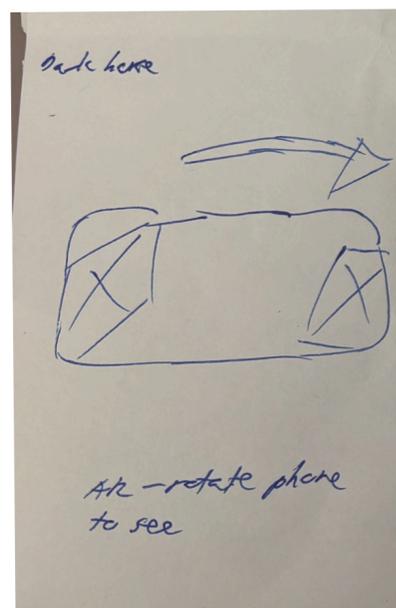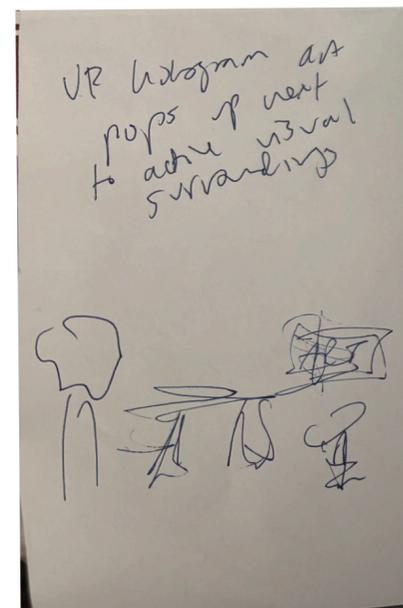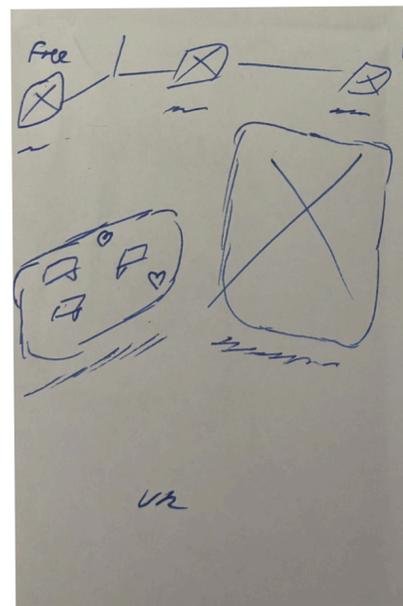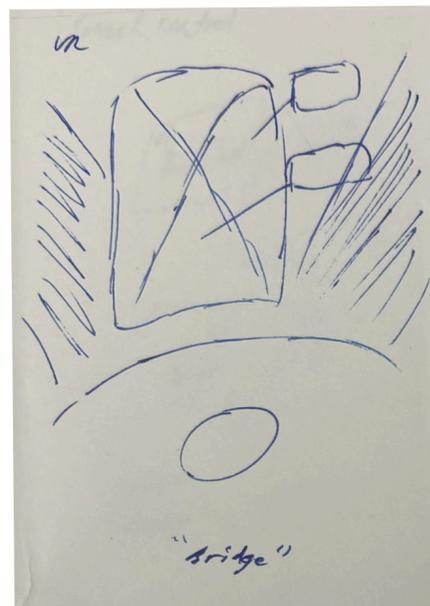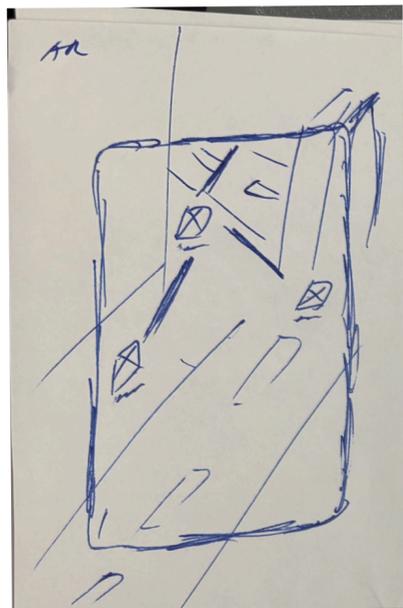
Solution Ideas: Wearables
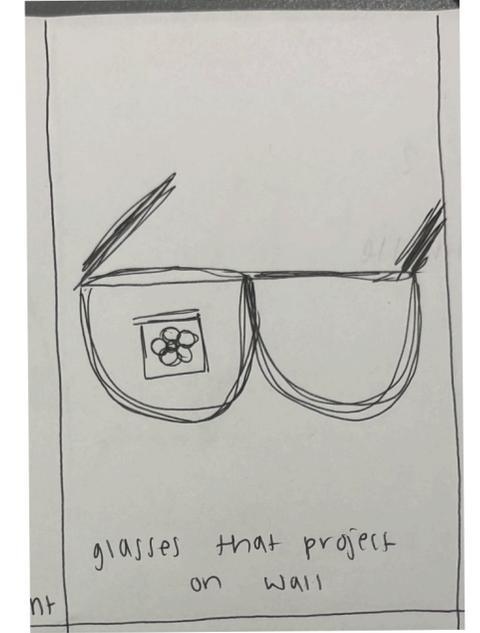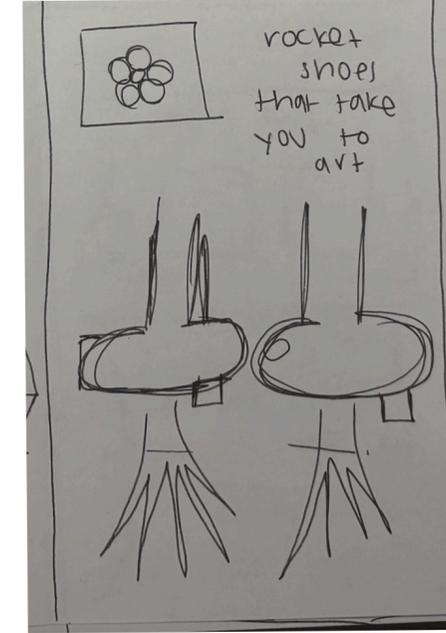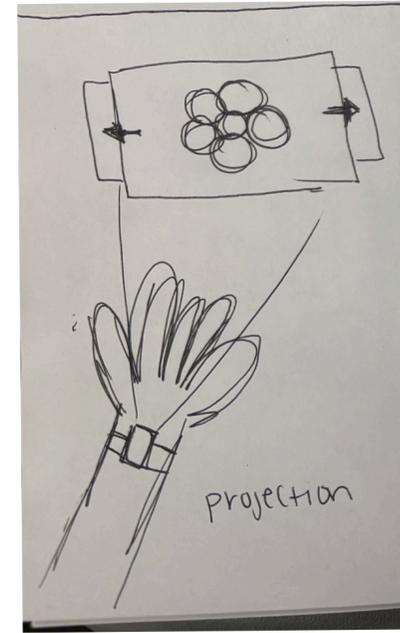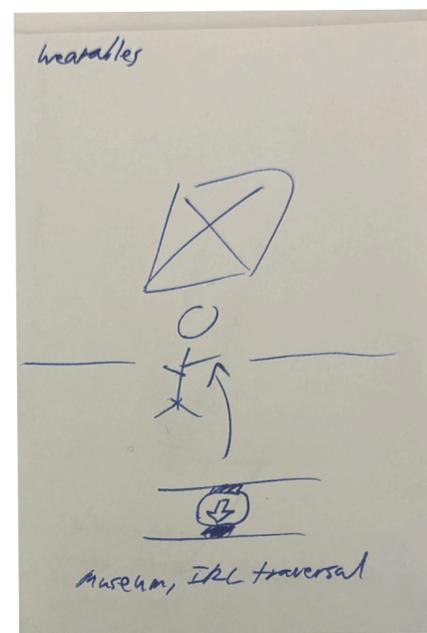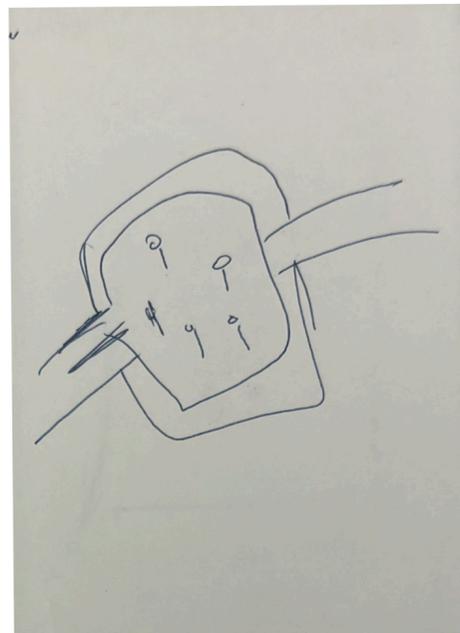
AR Interface: Full Tradeoffs

Pros

1. Immersive: feels immediate + real
2. Makes visceral art experience accessible despite geographic location
3. Larger visual field to see more content: e.g., you can zoom in to see greater detail
4. Targeted toward main use case of VR: entertainment
5. Novel and interesting to people who may not normally be exposed to VR

Cons

1. Not accessible in cost, especially to target user group (creatives)
2. Faces adoption gaps and knowledge on how to use - hard to get substantial user base to build social interactions of the experience
3. Typing and other interactions are typically harder and more physically clunky
4. Target user group may not want novel tech like AR/VR

Mobile App: Full Tradeoffs

Pros

1. Accessible: many people have phones
2. Phone UI paradigms (swipe, zoom in/out, etc.) are well understood by people and intuitive
3. Easily add comment/posts/photos on the go
4. Interacting is *physically* easier for tasks like adding text or uploading photos / works – as opposed to AR

Cons

1. Screen might be too small to visualize large-scale maps
2. Less immersive than VR/AR and could be less inspiring
3. Less novel and differentiated from other competitor apps (Instagram, Pinterest, etc.)
4. Risk of doom scrolling

Testing Results (Participant 1)

Critical incidents

Add a severity rating from 0 to 4 (0 being very minor, and 4 being the most important)

Posaitive critical incidents:
- Task 3: Added reflection to prototype successfully (1)
- Task 1: opened picture successfully immediately (2)

Negative critical incidents:
- Had to ask for task again (1)
- Used drawing tool the same way annotation / reflection tool used (3)
- Task 2: clicked journal to see other users' reflections and took a while to get there (4)
- Task 5: confused on where / which section of app to upload photo, assumed it would be under profile (4)

Reflections

Quotes
- "Looks like I can draw on it or something, not sure what to do, going to click x"
- "What's the purpose of annotations and what's the goal of the app?"
- "Error messages were confusing"
- "Annotate…alright, using Stanford words"

Emotions
- Confusion about various parts of app and goal of app
- Amusement: association with certain words/app language less accessible for broader demographic (i.e. 'annotate')

Bottom line (quantitative) data (range of 1 to 7):
- 2: easy to use app
- 6: likely to at least download and check out the app

Usability goals

Intuitive: How many misclicks did the user make?
- Task 1: 0
- Task 2: 4
- Task 3: 0
- Task 4: 0
- Task 5: 3

Efficiency: How long does it take for the user to complete each task?:
- Task 1: 0m:27s
- Task 2: 1m:22s
- Task 3: 0m:25s
- Task 4: 0m:50s
- Task 5: 1m:48s

Testing Results (Participant 2)

Critical incidents
Add a severity rating from 0 to 4 (0 being very minor, and 4 being the most important)

Positive critical incidents:
- Task 2: went back to graph and zoomed into angel piece by pinching fingers, then clicked on image and added comment (2)
- Task 3: figured out reflection immediately (2)
- Task 4: went back to journal to draw on it (1)
- Task 5: successfully and immediately uploaded art (2 to 3)

Negative critical incidents:
- Task 1: went to wrong angel, and scrolled away to different traversal part of graph, clicked the wrong angel, and clicked the plus button, exited, clicked wrong angel went to journal and clicked angel in journal (4)

Reflections
Quotes
- "Can't really test zoom in or out, or moving with the paper prototype"
- " I didn't understand the difference between journal and graph, did I have to draw in one part or …"

Emotions:
- Some confusion with various parts of app

Bottom line (quantitative) data (range of 1 to 7):
- 3: easy to use
- 6: likely to download, more likely to download if into art

Usability goals
Intuitive: How many misclicks did the user make?
Misclicks:
Task 1: 8
Task 2: 0
Task 3: 0
Task 4: 0
Task 5: 0

Efficiency: How long does it take for the user to complete each task?:
Task 1: 5m:10s
Task 2: 0m:10s
Task 3: 0m:32s
Task 4: 0m:31s
Task 5: 0m:55s

Testing Results (Participant 3)

Critical incidents
Add a severity rating from 0 to 4 (0 being very minor, and 4 being the most important)
Positive critical incidents:

- Task 2: swipes up on reflections page to see reflections (1)
- Task 3: able to type and submit reflection (2)
- Task 4: emulated zooming in while annotating (2)

Negative critical incidents:

- Task 1: had to tell her she can move screen around to traverse, moved screen to traverse, misclicked angel before selecting correct photo (0)
- Task 4: was trying to do task under graph section instead of journal section initially, writing under journal section (4)

Reflections
Quotes

- "when you add something, how does it place it into the web?"
- "navigating graph felt intuitive"
- "calling it graph not intuitive…web, map, chart instead"
- if i could annotate and save journal directly from graph is better; having to go to journal after graph to annotate on same photo "felt clumsy"
- "not confusing, but definitely more questions? is everything in the graph user-generated or is it pre-populated?"
- "As an art historian, am I only looking at other casual creator users or other professionals as well?"
- "if you're including user-generated content, are you doing anything to manage copyright permissions?"
- "I like how you can have users add to art, because who is defining what art is worthwhile?"
- "what is purpose of app: is it casual, emotional experience with art or is it a research tool or thinking about curating a show? that could be cool if i could have my own empty graph, and i know i am going to put this work in, and add from a vault of other images from whatever collection i was look at. really comes down to, what the goal is?"

Emotions

- Confusion about graph and purpose / goal of app

Bottom line (quantitative) data (range of 1 to 7):

- 2 or 3 easy to use
- 4 on likeliness of scale to download

Usability goals
Intuitive: How many misclicks did the user make?

- Task 1: 4
- Task 2: 0
- Task 3: 0
- Task 4: 1
- Task 5: 0

Efficiency: How long does it take for the user to complete each task?:

- Task 1: 1m:05s
- Task 2: 0m:25s
- Task 3: 0m:46s
- Task 4: 2m:29s
- Task 5: 1m:12s

Testing Results (Participant 4)

Critical incidents

Add a severity rating from 0 to 4 (0 being very minor, and 4 being the most important)

Positive critical incidents:

- Task 2: clicks angel, swipes up to see more reflections (2)
- Task 3: clicks add reflection to start reflection; starts typing reflection, hits submit button (1)
- Task 4: clicks x from prev task, goes to journal, and annotates successfully (1)
- Task 5: hits plus button on graph and starts to upload piece (0)

Negative critical incidents:

- Task 1: pinches and zooms to look at art; misclicks + doesn't see angel so says they are swiping to try and find angel; clicks plus button to see if there are other things to look at, exits and then finds angel (3)

Reflections

Quotes

- "plus sign was intuitive"
- "liked annotating on specific spots / parts"

Emotions

- confusing: "seeing other people's reflections", swiped up to "see more", just assumed that was what was going to happen

Bottom line (quantitative) data (range of 1 to 7):

- ease: 2
- likely to install: 5

Usability goals

Intuitive: How many misclicks did the user make?

- Task 1: 3
- Task 2: 0
- Task 3: 0
- Task 4: 0
- Task 5: 0

Efficiency: How long does it take for the user to complete each task?:

- Task 1: 2m:50s
- Task 2: 0m:27s
- Task 3: 0m:31s
- Task 4: 1m:01s
- Task 5: 1m:07s

Testing Results (Critical Incidents Log)

Critical incidents

Add a severity rating from 0 to 4 (0 being very minor, and 4 being the most important)

PARTICIPANT 1:
Positive critical incidents:
- Task 3: Added reflection to prototype successfully (1)
- Task 1: opened picture successfully immediately (2)

Negative critical incidents:
- Had to ask for task again (1)
- Used drawing tool the same way annotation / reflection tool used (3)
- Task 2: clicked journal to see other users' reflections and took a while to get there (4)
- Task 5: confused on where / which section of app to upload photo, assumed it would be under profile (4)

PARTICIPANT 2
Positive critical incidents:
- Task 2: went back to graph and zoomed into angel piece by pinching fingers, then clicked on image and added comment (2)
- Task 3: figured out reflection immediately (2)
- Task 4: went back to journal to draw on it (1)
- Task 5: successfully and immediately uploaded art (2 to 3)

Negative critical incidents:
- Task 1: went to wrong angel, and scrolled away to different traversal part of graph, clicked the wrong angel, and clicked the plus button, exited, clicked wrong angel went to journal and clicked angel in journal (4)

PARTICIPANT 3
Positive critical incidents:

- Task 2: swipes up on reflections page to see reflections (1)
- Task 3: able to type and submit reflection (2)
- Task 4: emulated zooming in while annotating (2)

Negative critical incidents:

- Task 1: had to tell her she can move screen around to traverse, moved screen to traverse, misclicked angel before selecting correct photo (0)

PARTICIPANT 4

Positive critical incidents:

- Task 2: clicks angel, swipes up to see more reflections (2)
- Task 3: clicks add reflection to start reflection; starts typing reflection, hits submit button (1)
- Task 4: clicks x from prev task, goes to journal, and annotates successfully (1)
- Task 5: hits plus button on graph and starts to upload piece (0)

Negative critical incidents:

- Task 1: pinches and zooms to look at art; misclicks + doesn't see angel so says they are swiping to try and find angel; clicks plus button to see if there are other things to look at, exits and then finds angel (3)