

Assignment 3f - Design Refinement Report

Artistry

Team: Sarim Abbas, Antonio Cao, TanTan Wang, Kenyon Duncan

Problem & Solution

Problem

Much of an artist's journey is unreadable and therefore unrecognizable to a consumer or critic. How can we empower artists to represent the evolution of their work? In the status quo, many artists write in journals, take process photos, shoot montages, write essays etc. The purpose of these projects is either to provide the necessary context to consumers, or for artists to clarify their process to themselves. But these projects can take up a significant amount of mindshare and time or even morph into full works in their own right.

A related problem is of collaboration. No two artists are alike, and have different processes, inspirations and styles. How can we enable other artists to jump in and work together in the creation process?

Solution

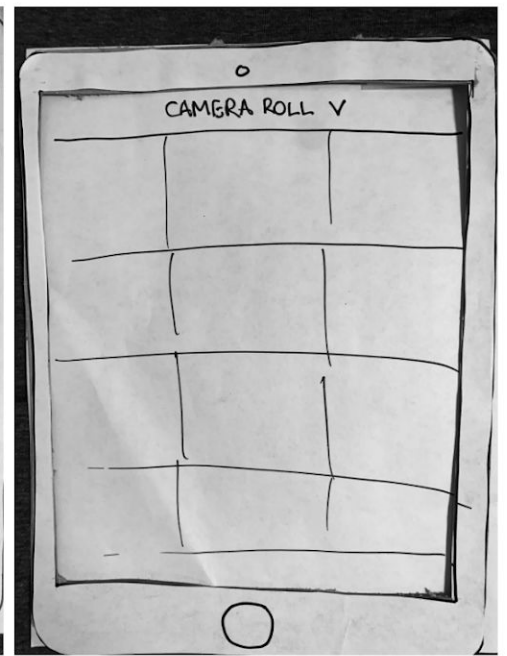
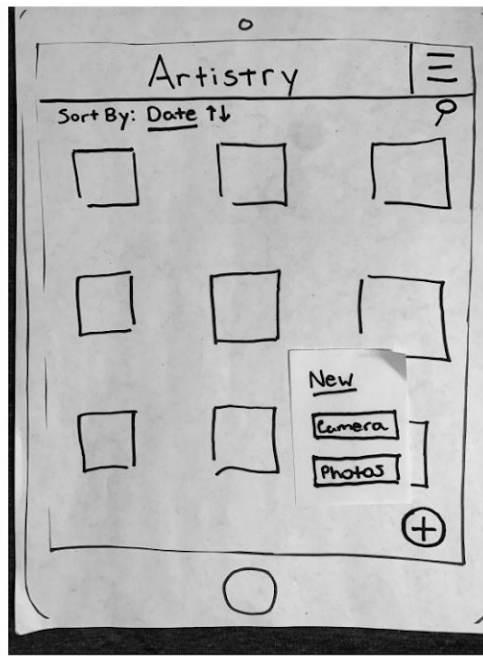
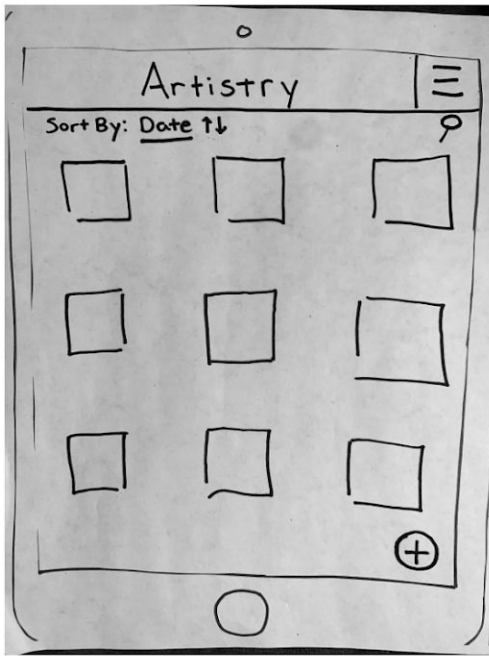
Collaborative tools and environments for 2D digital artists already exist. We are instead targeting 3D artists (sculptors, architects, AR/VR creators, animators) and building a mobile application that provides 1) a section to collect ideas, 2) collaborative tools and 3) a community to engage and share with.

Initial Paper Prototype

Task 1: Viewing Art History

Bob is an artist who is creating illustrations for a website. Bob has spent 2 months on this work, going through a dozen iterations, and he uses our app to show the artistic creation process to his clients, in order to help them visualize how the idea takes shape.

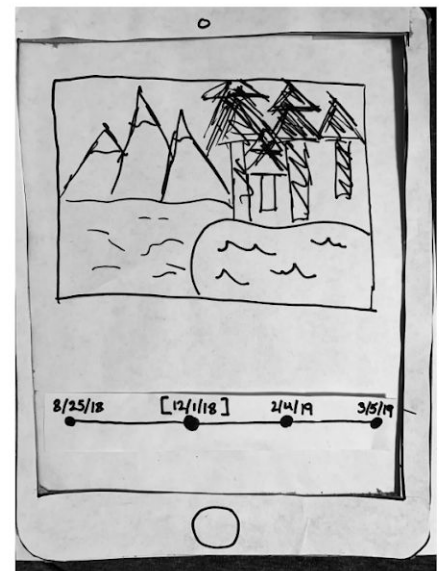
At the beginning of this creative process, Bob creates a new project in the app and imports the initial sketches of his ideas by hitting the "+" sign on the bottom right of the app. Whenever he finishes a part of the artwork or starts a new idea, Bob whips out his phone, takes a snapshot of the work, and records it in the app.



Two months later, when Bob's client asks him for a progress update, Bob uses the app to generate a sequence of images with a slide bar that scrolls through the whole creation process.



-> User taps "History" ->

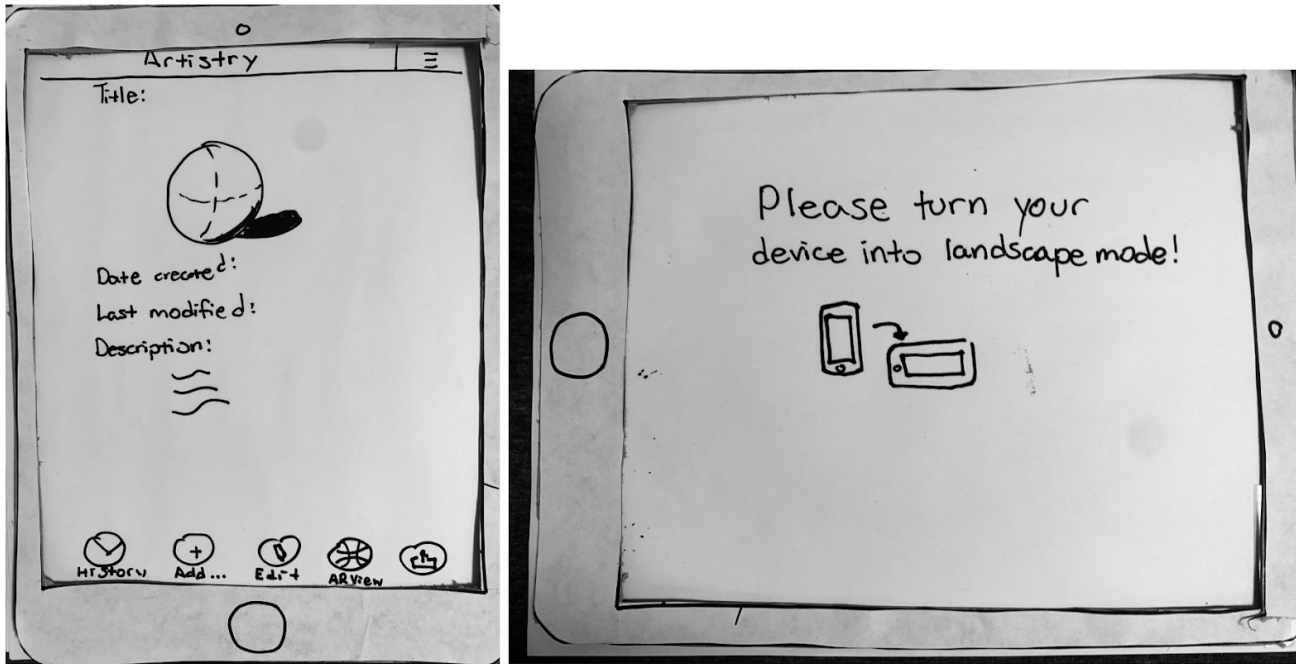


Bob can now view each "snapshot" as a date or time in context of the entire processes' timeline.

At the end, Bob exports this project from the app to his portfolio. The app automatically generates a sequence of snapshots that display the artistic creation process in a nice, clean layout.

Transitioning from 2D to 3D

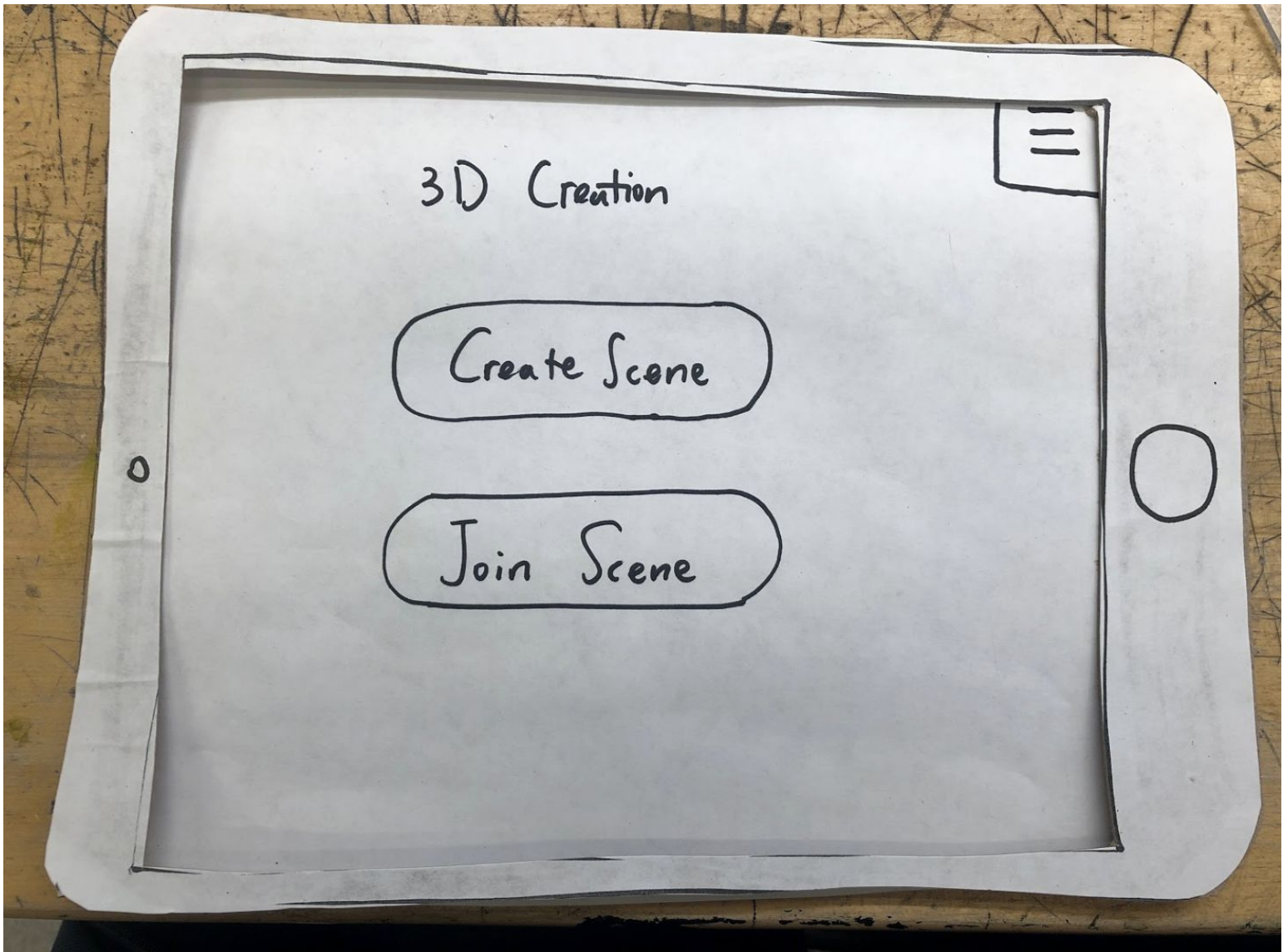
When considering all visual artists, 3D creation is a very important part. When an artist pulls up a project created in three-dimensional space, we offer a “3D Mode” that allows the user to interact with the object in augmented or virtual reality.



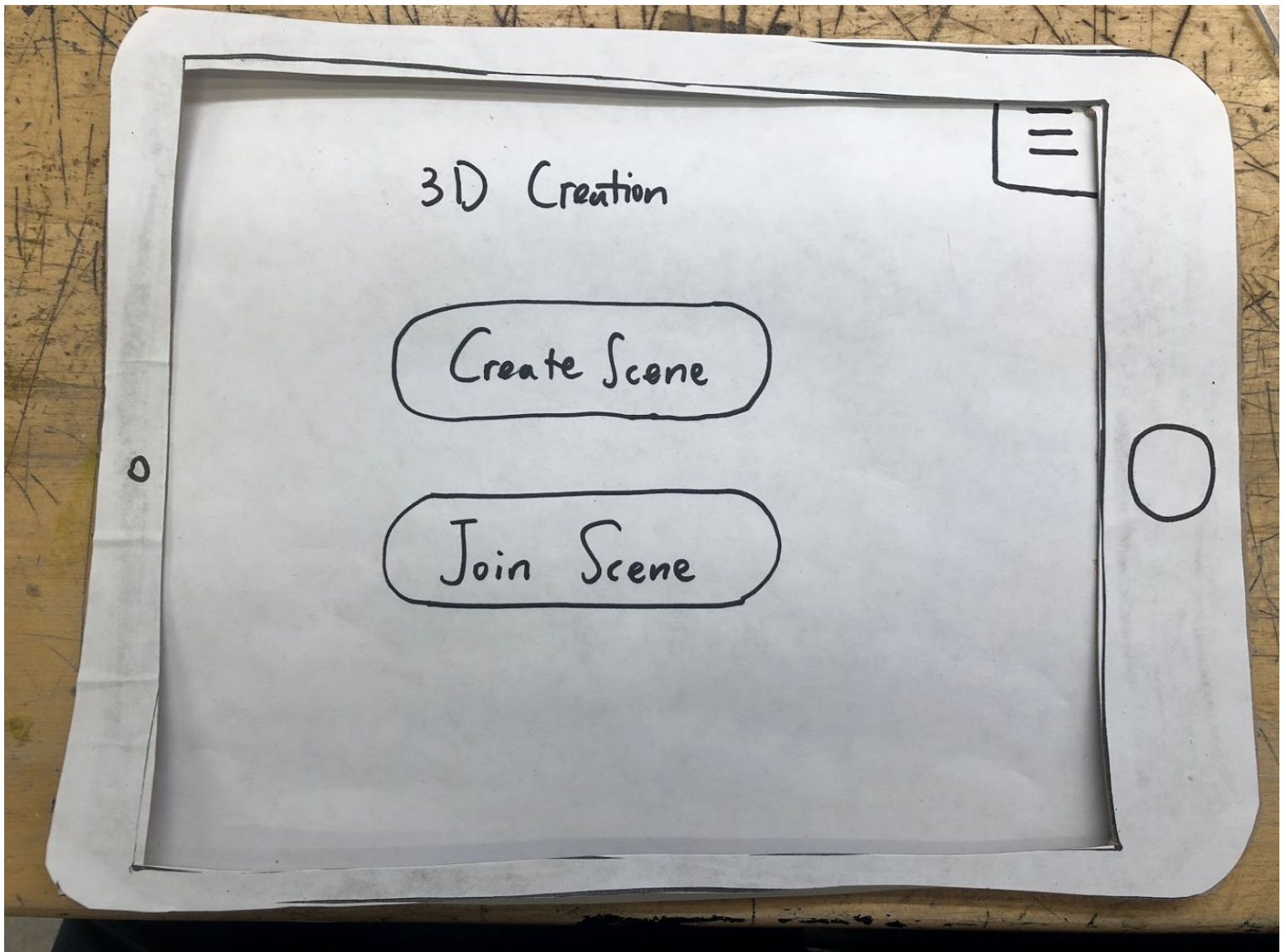
Task 2: Collaborative 3D content creation on mobile

Jack (User 1) and Tina (User 2) are 3D designers collaborating on a project. The following prototypes shows a part of their workflow.

Creating a Scene

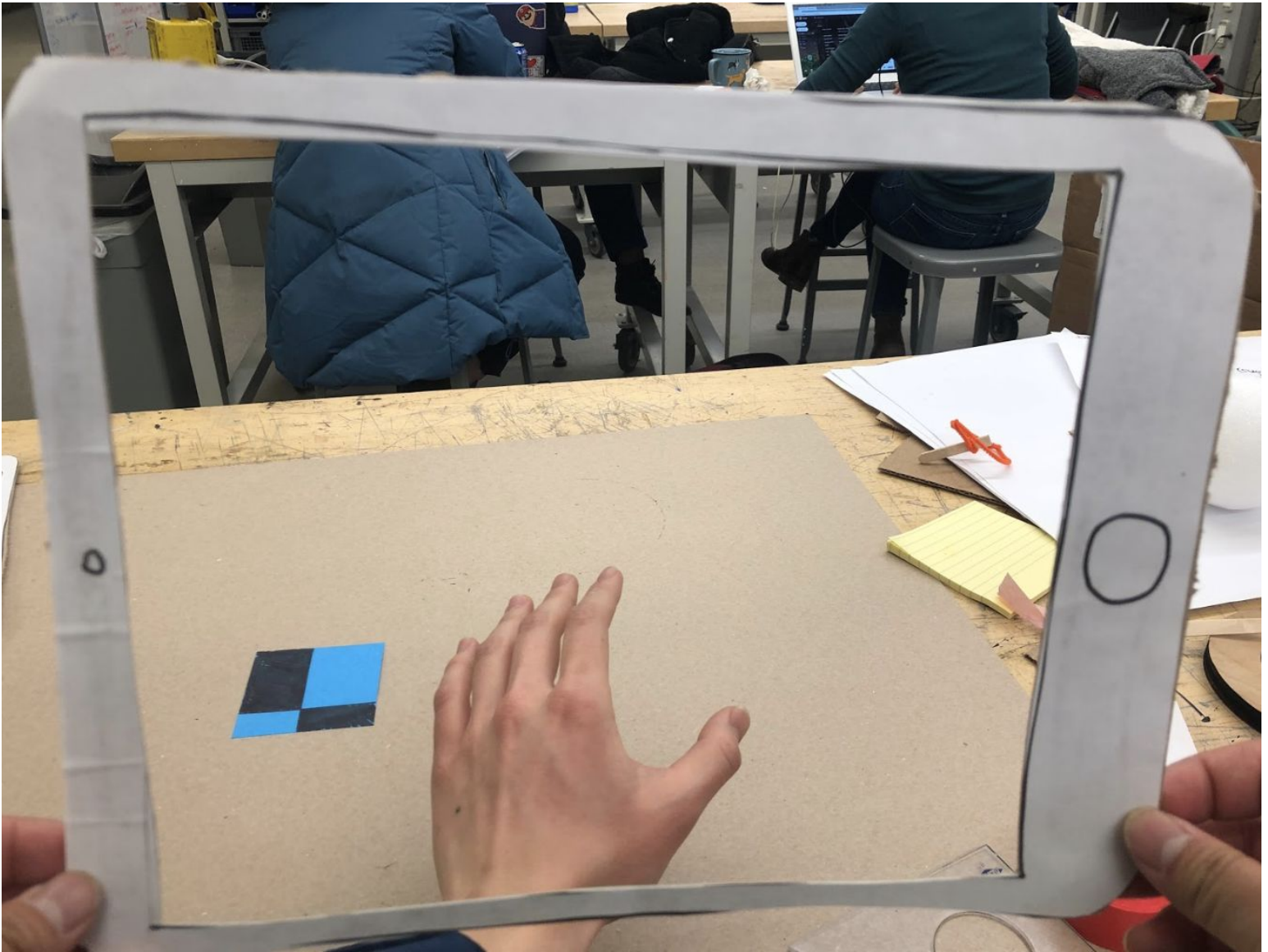


This is the main screen for scene creation in our mobile app. Jack opens the app and click on the “Create Scene” button. The button on the top right allows Jack to use other functionalities of the app.

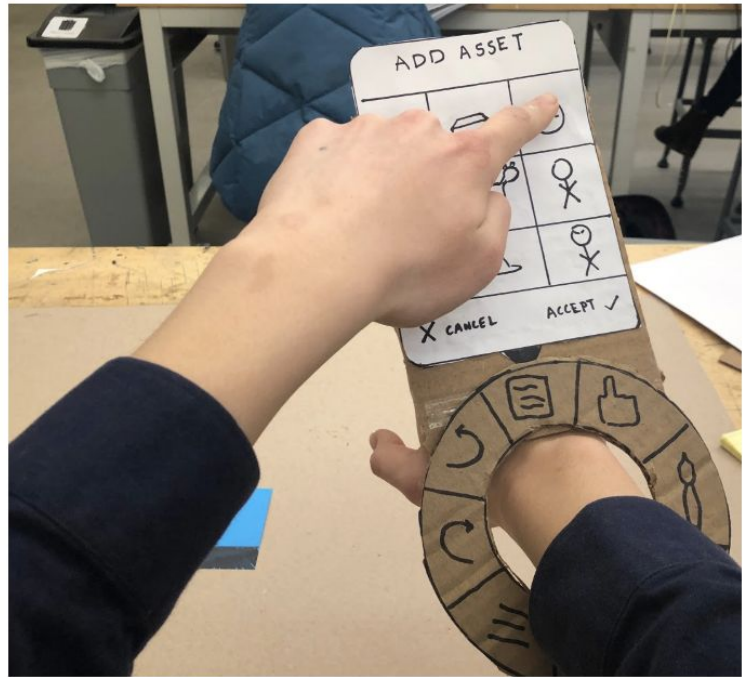
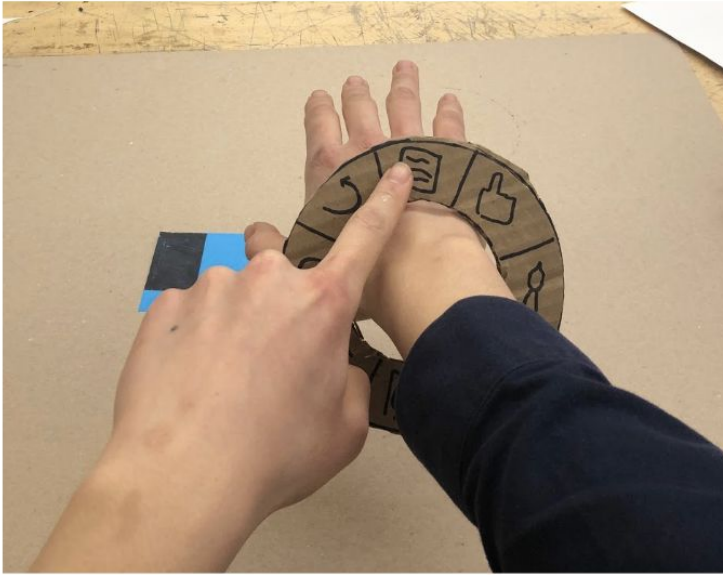


After Jack clicks on the "Create Scene" button, the app goes to the "Create Scene" option. There is a "Scene Library" that allows Jack to select pre-built 3D scenes stored in the app. However, Jack decides to create a entirely new scene, so he selects the "Create New" button.

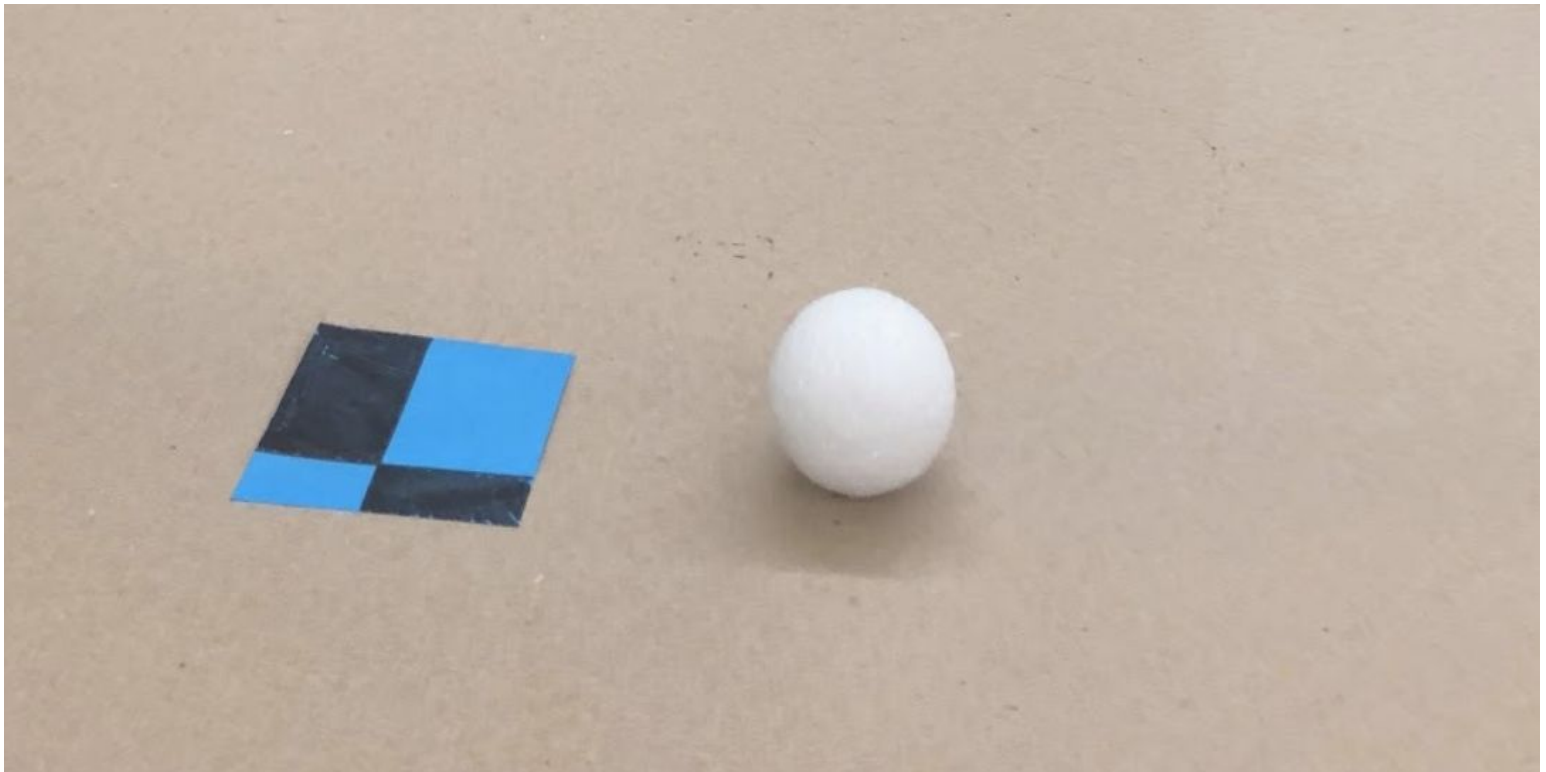
Import Asset



Jack creates a new empty 3D scene, and attaches his phone onto the Google Cardboard to visualize the 3D scene. The app uses the phone's camera to recognize Jack's hands and displays a virtual hand in the 3D scene. The blue marker in the virtual scene shows the origin of the virtual coordinate system.

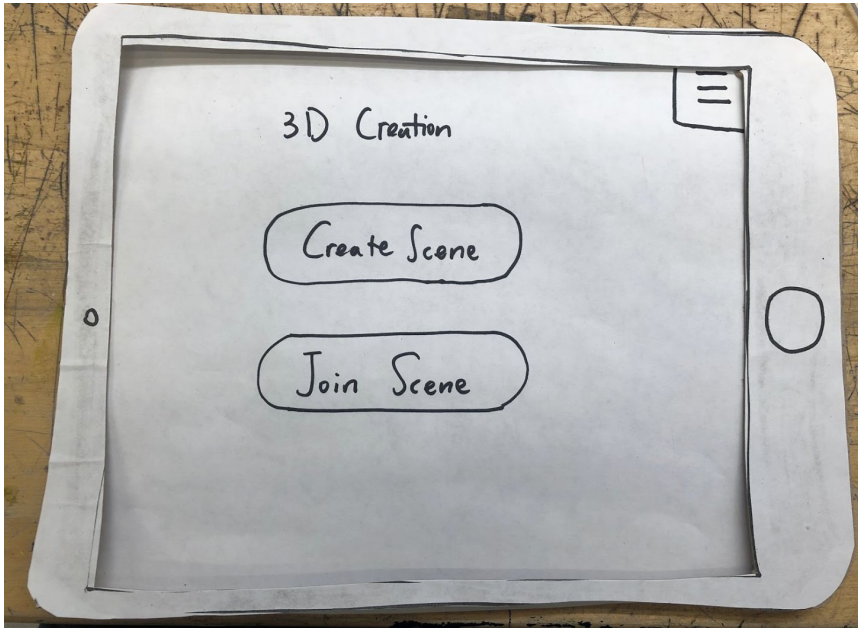


Jack moves his right hand to bring up the virtual control wheel in the app. He rotates the wheel to select the “Add Asset” tab, clicks on it, and selects a sphere to import into the scene. The “Add Asset” tab also allows the user to import a variety of assets, such as human models, leaves, and wizard hats.

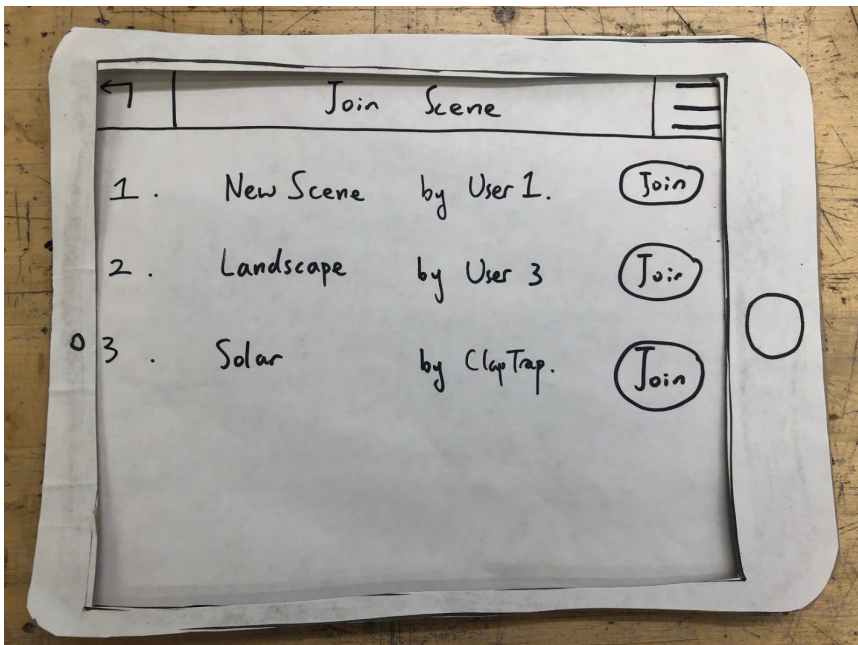


The app imports the 3D sphere to a location near the origin of the 3D scene. The sphere is initialized to a default size; Jack would like Tina to change the size of the ball to fit her design.

User 2:



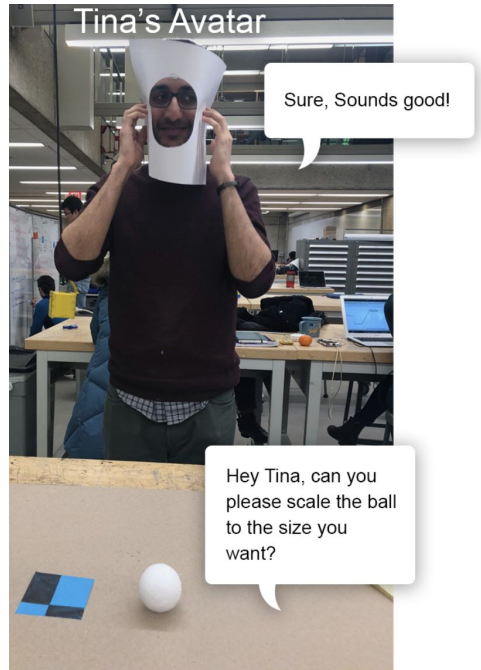
Tina (User 2) also opens our app on her phone. She selects the “Join Scene” button to join the scene that jack (User 1) has just created.



The app searches the nearby bluetooth signals for connection, and displays a list of 3D scenes created by people nearby. Tina clicks on the “Join” button next to the “New Scene” created by Jack (User 1) to join his 3D scene.

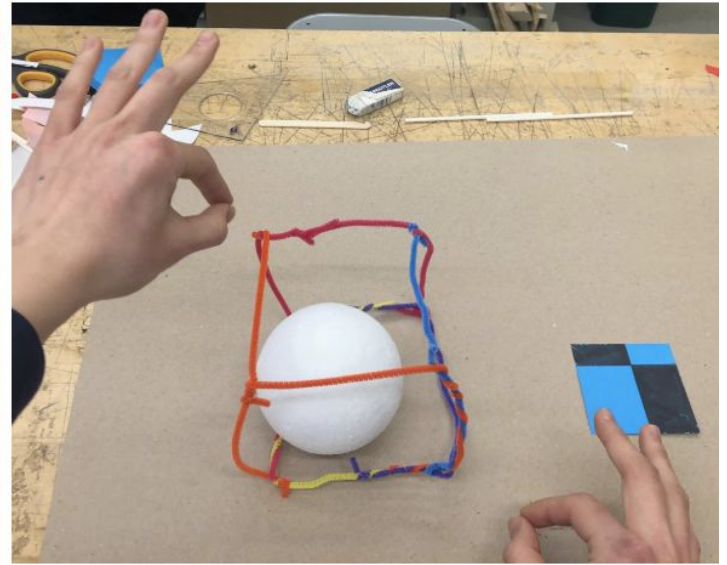
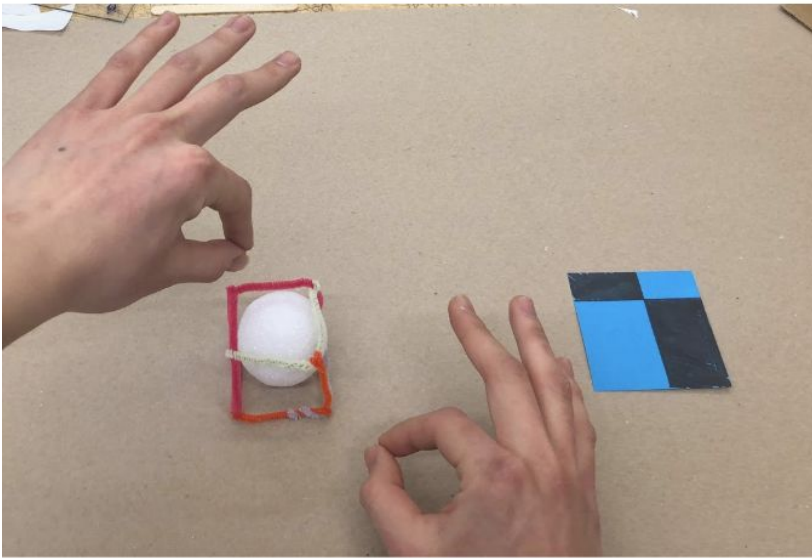
Collaboration

From Jack's perspective:



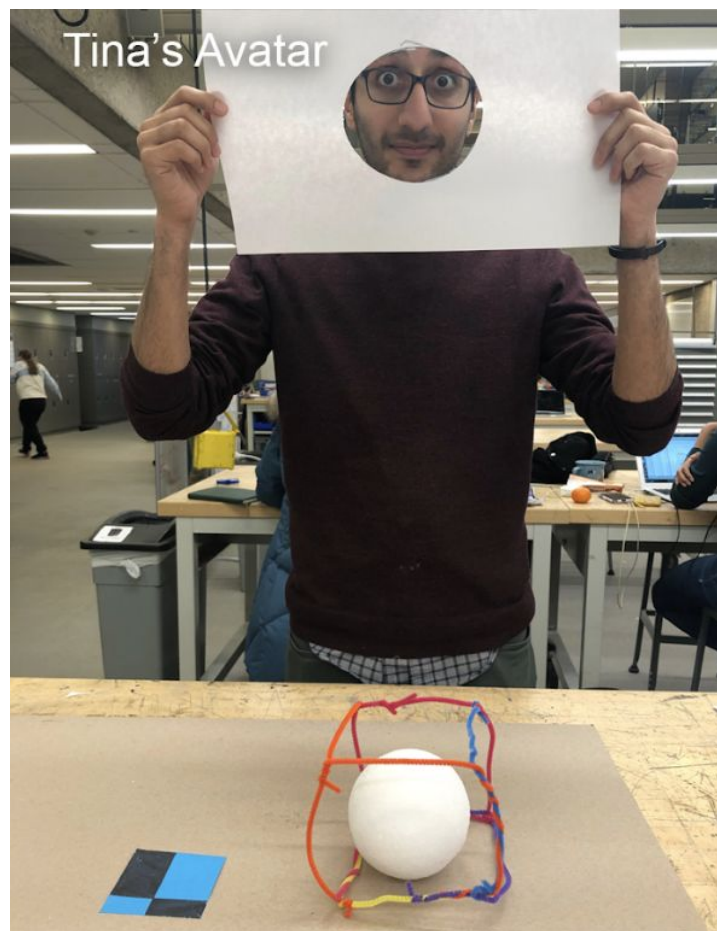
Jack sees Tina (a virtual avatar) joins the 3D scene on the other side of the workspace. He greets her and asks her to scale the ball to the size that she likes.

From Tina's perspective:



Tina selects the ball and a 3D box appears around it to show that it is selected. Then Tina picks two diagonal corners of the ball to scale it up using her gestures.

From Jack's perspective:



The ball is also scaled up in Jack's perspective. Through this process, Jack and Tina can collaborate on the same 3D creation project together.

Testing

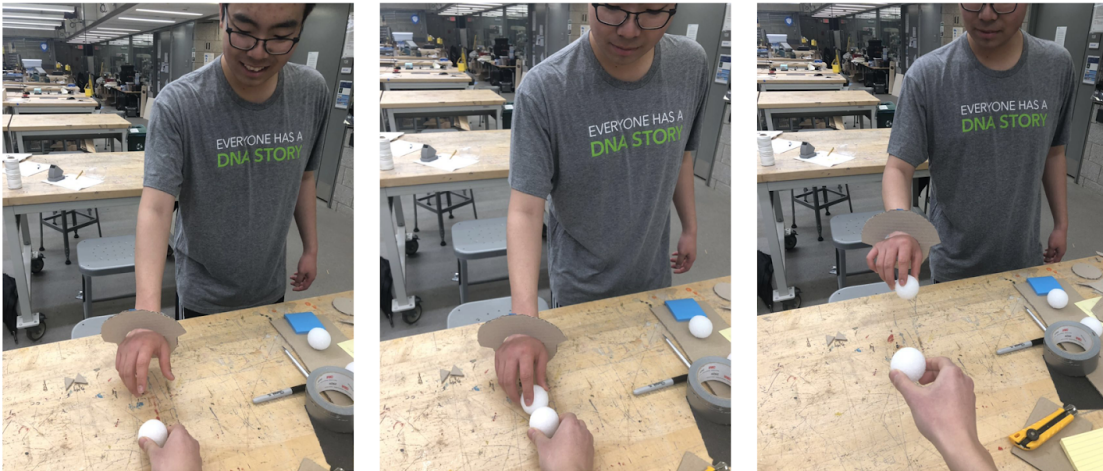
Usability Test 1

The first usability test was described in Assignment 3c - the Usability Testing Milestone.

Rationale for participant, background, environment

X was an aide at the CEID. His discipline is mechanical engineering, but has interests in a variety of design tools and techniques, that span vector graphics and 3D modelling and printing. Therefore, we felt that he would be a suitable candidate to give us feedback on our Artistry project (which consists of an interface spanning two devices - a mobile app, and a 3D mode in an AR/VR space).

The test was conducted at a CEID, on one of the workbenches, where the prototype (the large canvas, the 3D styrofoam assets/spheres, and other paper components) was laid out.



Test protocol

We first sketched out a proposal as indicated in lecture. The proposal consisted of the following components:

- **Objective:** To find and fix flaws in an hybrid interface
- **Description of system:** The hybrid interface allows artists to log their process, and create content when mobile. The prototype system consists of two discrete sub-types: one for the mobile world, and the other for an AR/VR world
- **Environment, participants:** (already mentioned)
- **Tasks:** 1) Logging artists' process, 2) Content creation when mobile
 - The tasks included in the first part are on a mobile app:
 - View the history of a previous artwork.
 - Create a new workspace and exit a workspace.
 - Join in a previously created workspace.
 - The tasks included in the second part are using the virtual workspace:
 - Create a sphere in the workspace.
 - Modify the sphere in the workspace.
 - Fork the history of a workspace

- **Measures:** These included subjective ease of use, and time taken to complete two scenarios (in the first case to edit and open a project on the mobile interface, and in the second case to resize a 3D asset in the AR/VR interface). More measures are below in the Results section.

We then introduced the test to the participant and told him our objective, and the scenarios he would have to complete. The participant is given the context: to create a 3D object and document his creative process using our app. We made sure to avoid feelings of judgement, by falsely stating that we did not develop the prototype. This put the participant at ease.

We then conducted the test, providing direction to the participant where necessary, but mostly letting him figure out the path to the end goal on his own. Every time he clicked a button, we would swap in a reusable module of the prototype. If some interactions were irrelevant, or we did not have the modules ready, then we would ask the participant to try another interaction/button. Sometimes the participant was quiet during the process, so we asked him to tell us the rationale behind every interaction he did.

After the test, we debriefed the participant about what the study was for, how the collected data will be used, and assured anonymity.

Lastly, we analyzed the data and compiled the results (below).

Roles of team members

- Antonio: introduce the interface and guide the user
- Kenyon: record the response and debrief
- Sarim: setup the prototype and build revisions
- TanTan: documentation and data analysis

Revisions of prototype made

We encountered two positive and one negative incident from the first usability test. The negative incident was the inconvenience of the undo button on the wrist wheel and merited a revision. This was ranked severity 4. Our revision was to create a shortcut gesture with two fingers, so experienced users can quickly undo.

Usability Test 2

Rationale for participant, background, environment

Y is a student majoring in mathematics. He loves creating 3D mathematical objects and printing them out in the 3D printers of the CEID. He is also very passionate about AR/VR technology, and thus we believe that Y is a great candidate to give us feedback on our Artistry project.

The test is done at the AKW, on one of the tables, where the prototype (the large canvas, the 3D styrofoam assets/spheres, and other paper components) was laid out.



Test protocol

The protocol followed very similar, if not identical to Test 1, albeit with the revisions from the first test.

Roles of team members

The roles of team members were the same. Adopting the same roles made the process go faster since we knew what to do.

Revisions of prototype made

We encountered a number of issues, which are explained further in the Table of Results. But these are the revisions we made:

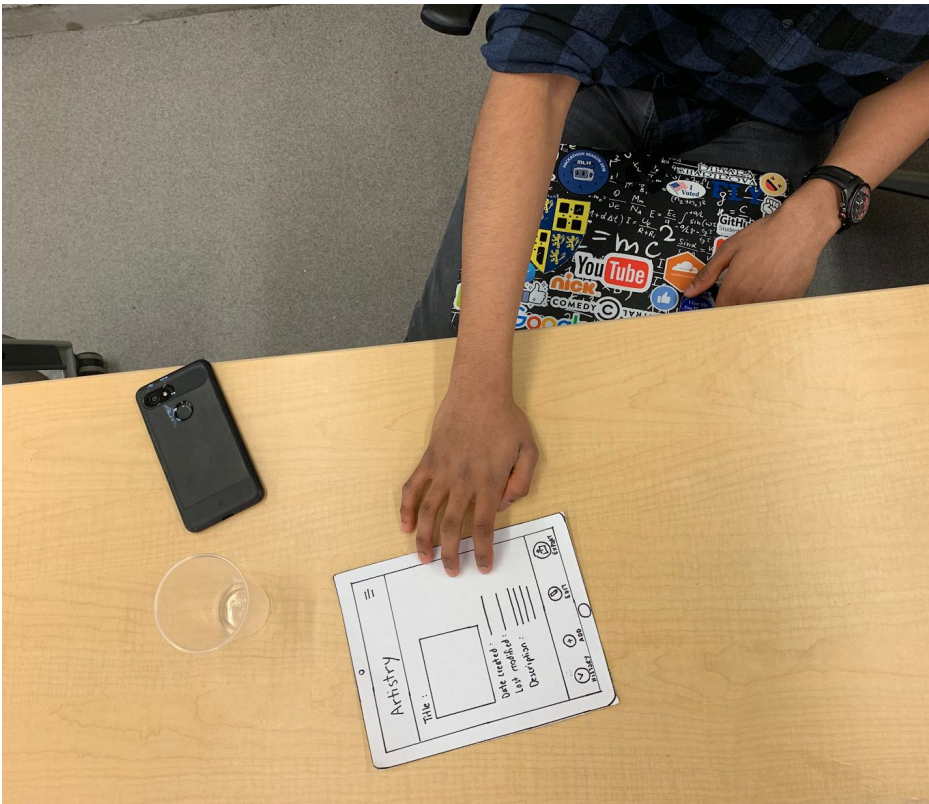
- Selection
 - The participant found selection to be unintuitive. What if he is sitting, and an object is far away?
 - So we included an additional means of selection: a ray that projects from your finger-tips.
- History
 - A linear timeline to scrub through versions of an object was confusing for the participant.
 - So our revision was to create a circular-tracing gesture to “rewind” the history of the object.
- Wrist wheel
 - Having the wheel up on the wrist made it awkward for the user to manipulate. Visibility of the icons was also an issue.
 - So the revision was to conjure up the wheel by a hand gesture e.g. snapping of the fingers. Then, the user could manipulate the wheel in front of them. It is similar to the Surface Studio hockey puck.
- Collaboration conflicts
 - We had initially proposed phantom traces (similar to Git branches) to solve the real-time collaboration problem.
 - Professor Vázquez gave us feedback and asked how we might resolve merge conflicts. We also received a similar question from our participant. For him, the phantom traces could become very cluttered with more objects.
 - So our revision was to allow the user to keep working on an object as if it was exclusive to them. But the moment they edit the same property as another person e.g. color, then they are shown an alert box and phantom traces. They are asked how to resolve the conflict. But where possible, edits to an object are commutative to keep interruptions minimal.

Usability Test 3

Rationale for participant, background, environment

Z is a sophomore excited about novel technologies such as blockchain and AR/VR. His discipline is computer science. His involvement in a startup has cultivated skills including app and experience design. So we felt he could give us valuable insight into the usability of our Artistry project.

The test was conducted at a CEID, on one of the workbenches, where the prototype (the large canvas, the 3D styrofoam assets/spheres, and other paper components) was laid out.



Test protocol

The protocol followed very similar, if not identical to Test 1, albeit with the revisions from the first and second tests.

Roles of team members

The roles of team members were the same. Adopting the same roles made the process go faster since we knew what to do.

Revisions of prototype made

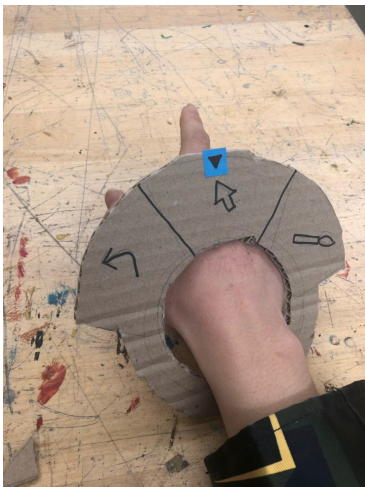
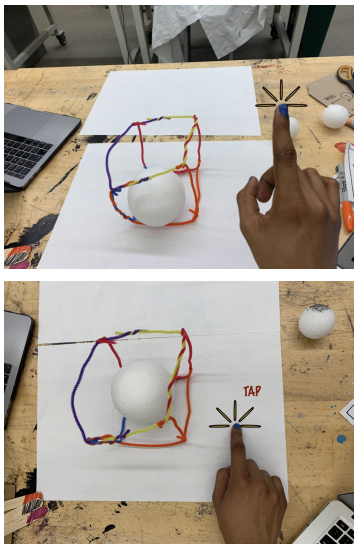

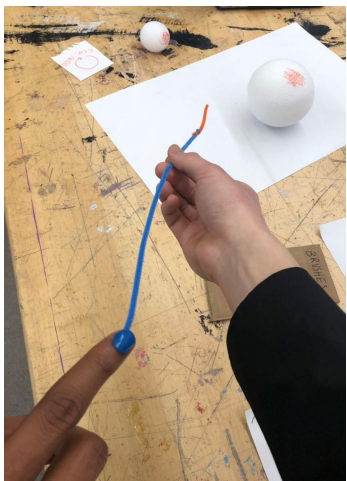
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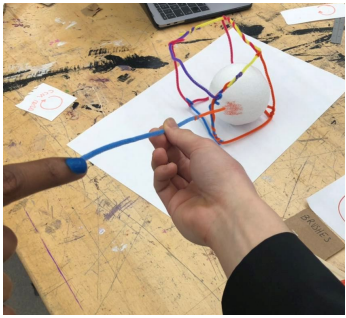
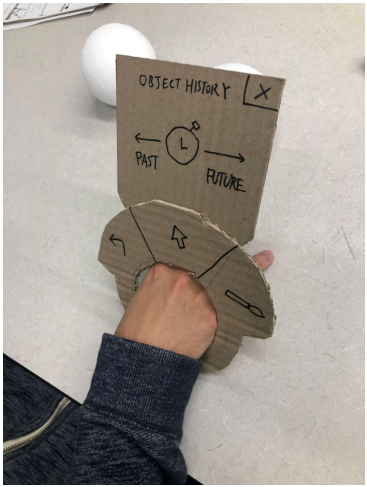
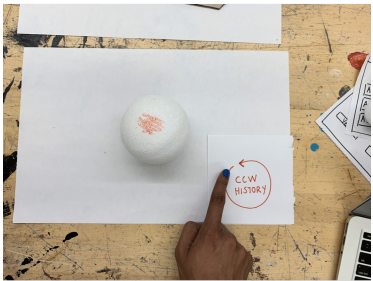


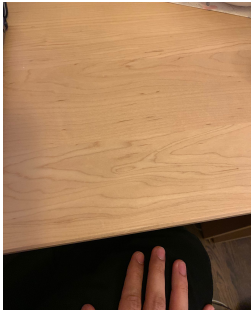
- Deselection

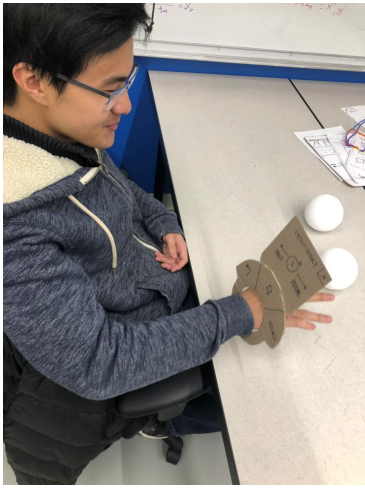
- It was not immediately clear to the participant how to deselect an object
- So we made it more explicit in our prototype that clicking away in space or on the blank canvas deselects the object and the transformation handles disappear.
- Opening up other options
 - This was before we made the revision to the history function: the participant did not know how to pull up the options for scrubbing through the object's history.
 - So we created a hamburger menu on the bottom of the wheel with less frequently used options. The menu contains the history options and others.
- Account creation
 - The participant wondered how to invite users to collaborate if there was no account system.
 - So we implemented mandatory sign up and login screens for users to create accounts and be identifiable to their colleagues.
- Deleting projects
 - We added a hold-to-delete mechanism (common on iOS) on the project list screen.

Testing Results

Table of Results

Image	Issue	Change	Fixed Image
	Severity: 2 How to deselect an object?	Click away in space. This is analogous to how deselecting works in most other programs (design tools, word processors, etc). Alternatively, click on a blank part of the canvas to deselect.	
	Severity: 3 Selecting object from remote is unintuitive and tiresome.	Allow selection via pointing with index finger; when a finger is raised, a virtual ray will automatically appear, and a box will appear around the object that intersects with the ray. The user can confirm the selection by tapping his/her index finger.	

			
	<p>Severity: 3</p> <p>The icon to move back and forth in history is unintuitive. T gets confused when the icon pops up.</p>	<p>Enable the user to change history by rotation instead of a swipe. Clockwise is fast-forward and counter-clockwise is going back. When the button pops up, an animation will show how to view history.</p>	
	<p>Severity: 2</p>	<p>Make undo easier for power users. The undo button on the wheel is a little inconvenient. So we added a gesture: swipe left with two fingers on the canvas to quick undo.</p>	 



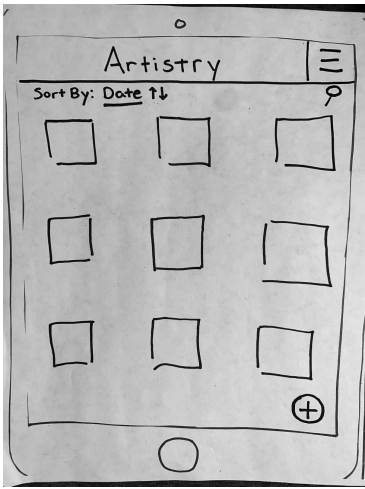
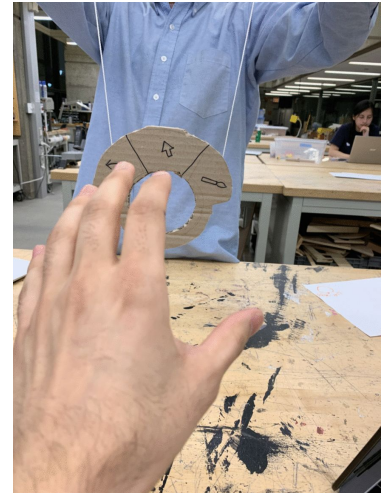
Severity: 3

The hand wheel on the wrist very unintuitive. Prefer to have a wheel in front of the hand.

Change the panel to be in front of the user's palm instead of on the wrist.

To bring up the panel in the first place, a simple hand gesture like snapping of the fingers can be used.

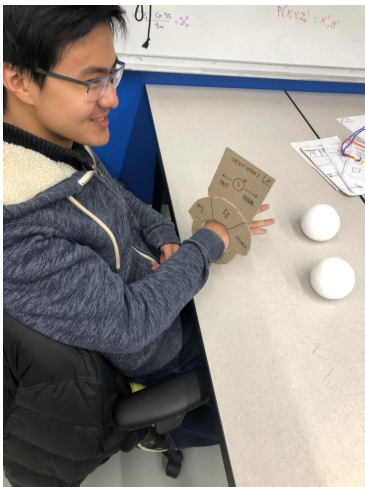
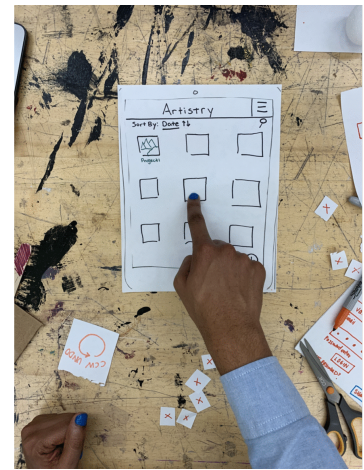
Then the panel can be rotated, used, and dismissed as normal.



Severity: 3

Deleting projects

Although this is not a functionality-breaking issue, we included the ability to delete existing projects using the traditional iOS metaphor of tap and hold.



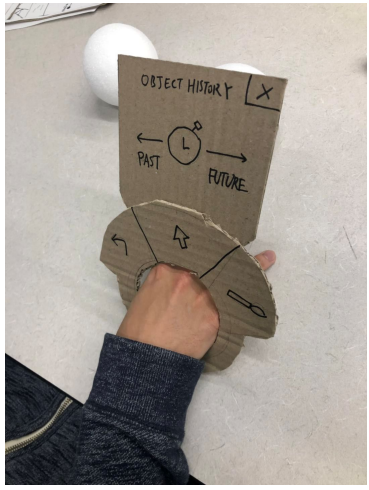
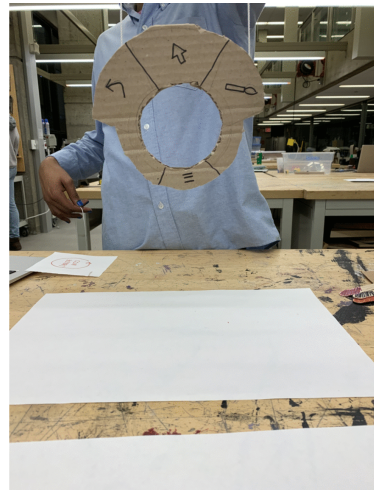
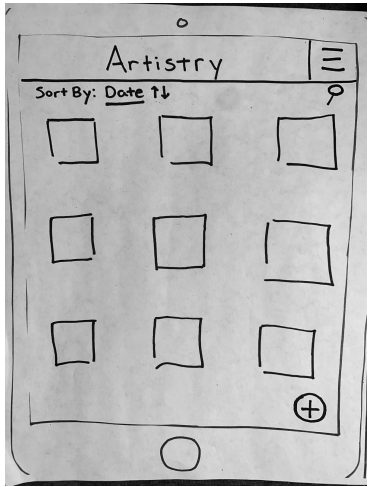
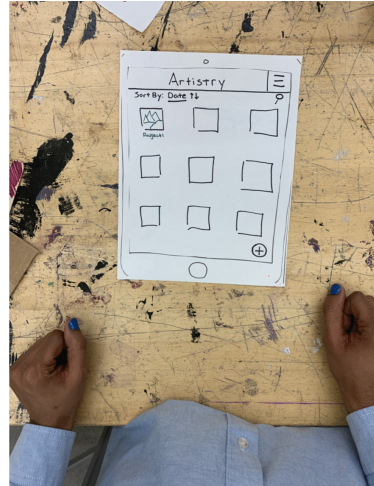
Severity: 4

The "phantom" object trace can be cluttered and confusing. Prefer to select and check object history directly.

When editing a property that is in conflict with a collaborator e.g. color, an alert box notifies you of conflict.

You can then choose to view the phantom trace, and decide how to merge (e.g. keep theirs, keep mine). This is similar to Git-based version control, adapted to VR space.



	<p>Severity: 4</p> <p>How to pull up the “Object History” panel?</p>	<p>Put a hamburger menu on the controller to contain all necessary miscellaneous menus and non essential controls, including seeing the “object history” function.</p>	
<p>This is the current home screen:</p> 	<p>Severity: 4</p> <p>How to collaborate with other users if they do not have accounts? Bluetooth only?</p>	<p>We decided it would be good to have an accounts system for collaborative editing not only when people are together, but also remotely.</p> <p>So we now have a login and sign up screen on first start up of the app.</p>	

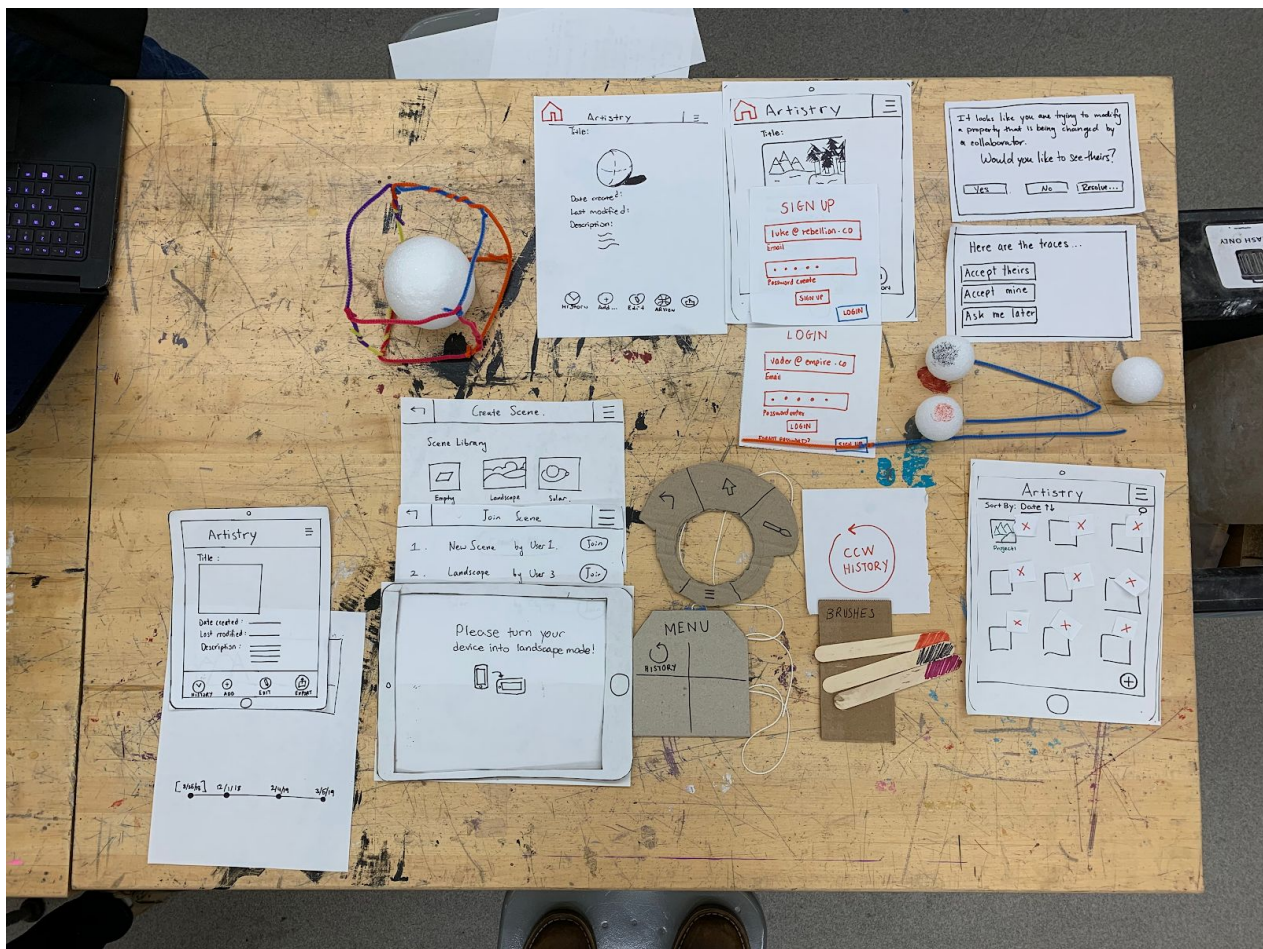
Essential Modifications

We felt that out of all the modifications we made, these were the most important:

- Collaborative conflicts
 - This aspect of our design was most important to refine. One of our core mandates is collaborative 3D design, and with that inevitably comes this challenge.
 - We took inspiration from the Git model, but applied it to a graphic, 3D and real-time environment. We consider each property change as atomic. Where possible, we make the changes commutative. When the same property is changed, however, we walk users through a conflict resolution process, and show them the “phantom trace” of the object. Crucially, we take the complexity out of the process with a simple “Use theirs, Use mine” dialogue.
- History
 - Closely related to our Git-style phantom traces is the ability to scrub through the entire history of the object. We refined our history feature with an intuitive circle-tracing gesture.
 - One of our main tasks is to make logging process easier. Smooth transition between the object’s state can be gratifying for both the artist and outside viewer.

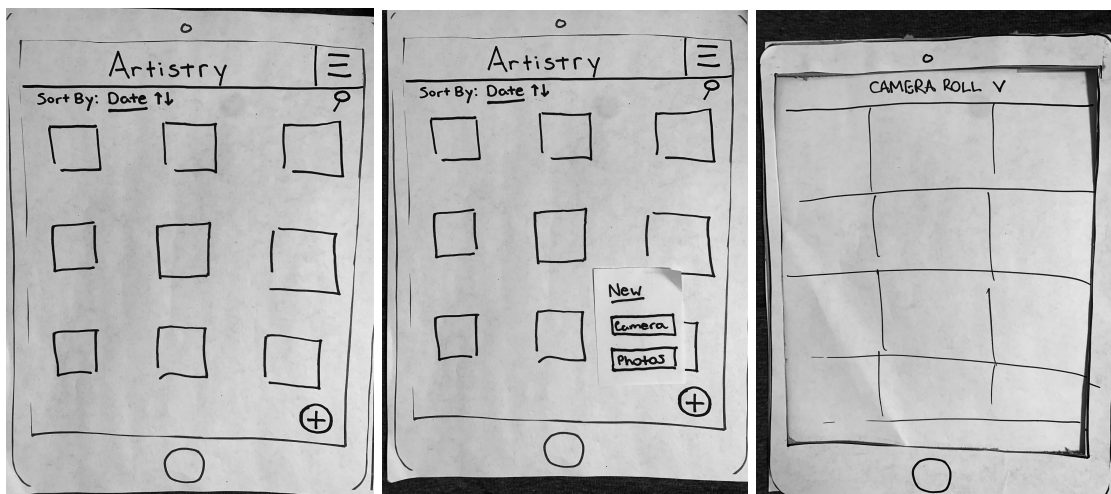
Final Paper Prototype

The overview image of all the components is below:



Task 1: Logging artists' process

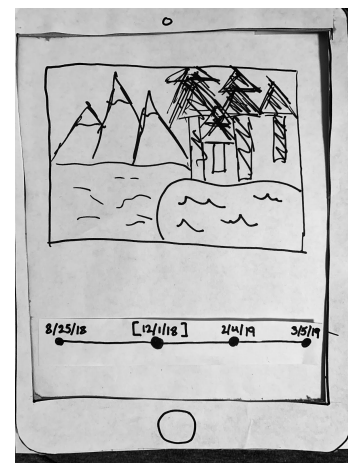
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Later, when Bob's client asks him for a progress update, Bob uses the app to generate a sequence of images with a slide bar that scrolls through the whole creation process.



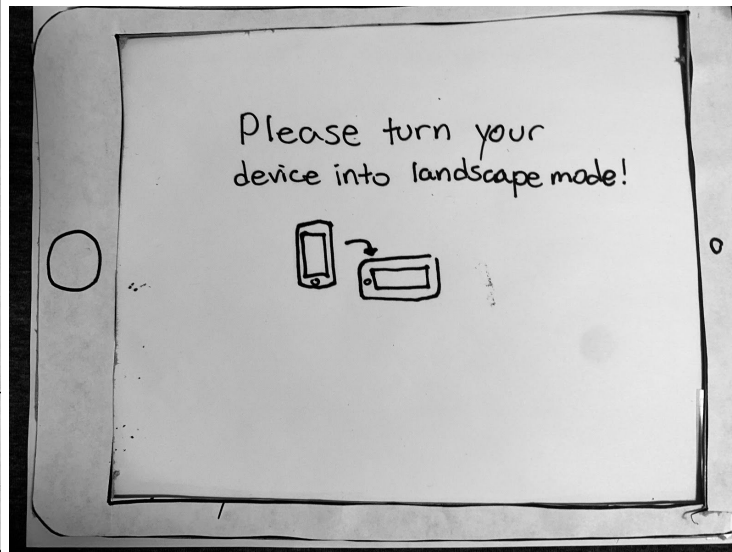
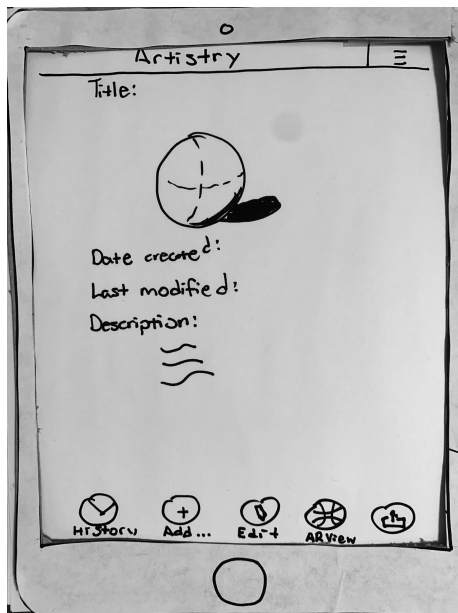
-> User taps "History" ->



Bob can now view each "snapshot" as a date or time in context of the entire processes' timeline. At the end, Bob exports this project from the app to his portfolio. The app automatically generates a sequence of snapshots that display the artistic creation process in a nice, clean layout.

Transitioning from 2D to 3D

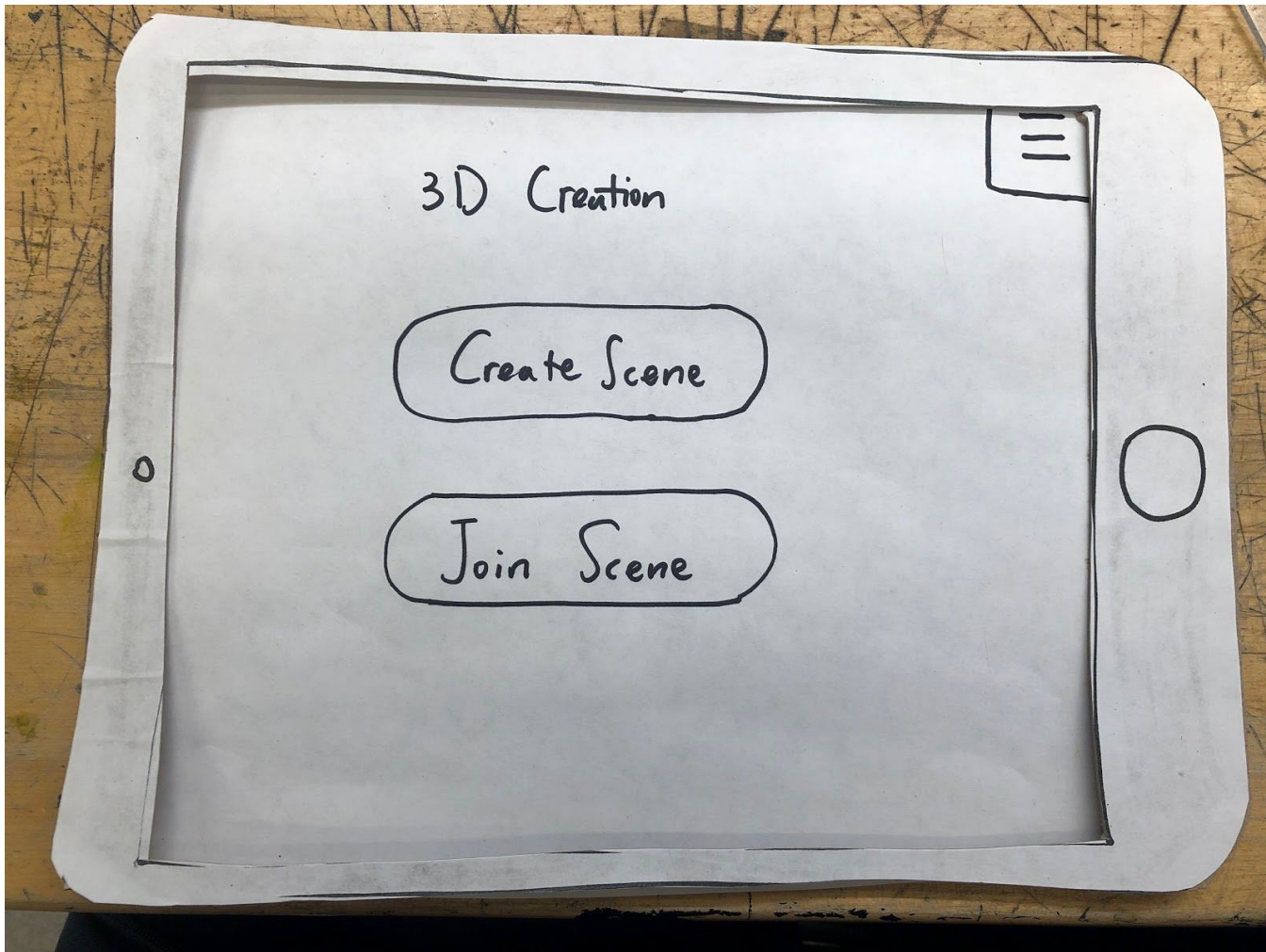
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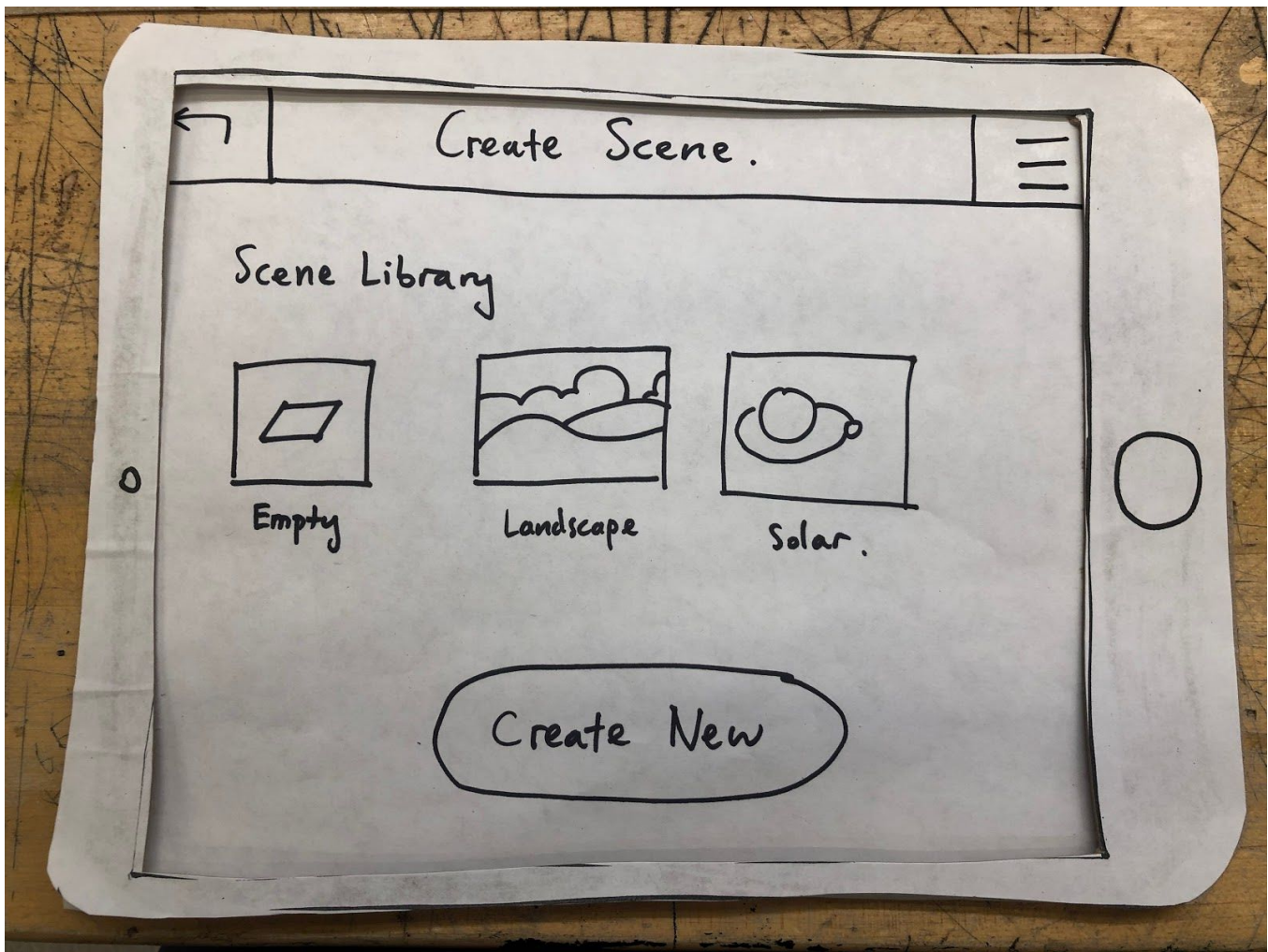
Task 2: Collaborative content creation when mobile

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Creating a Scene



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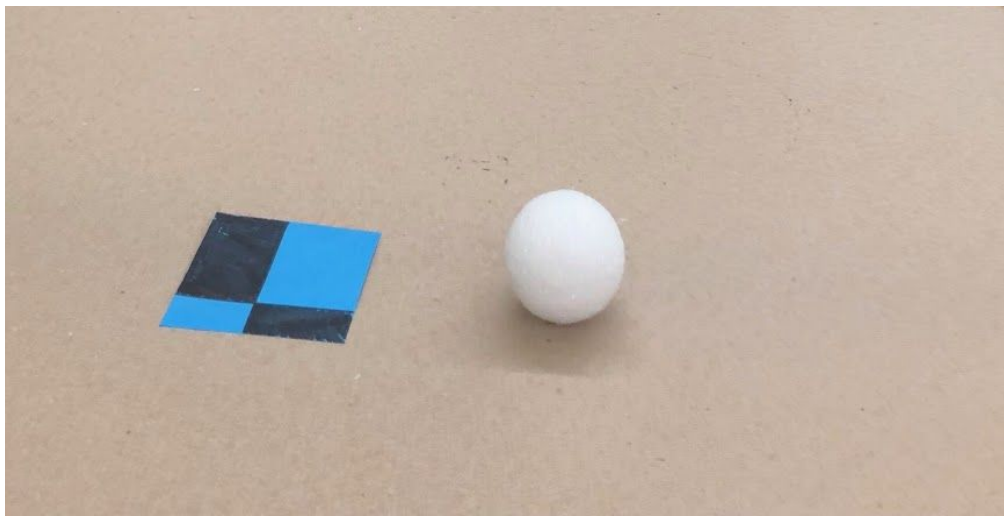
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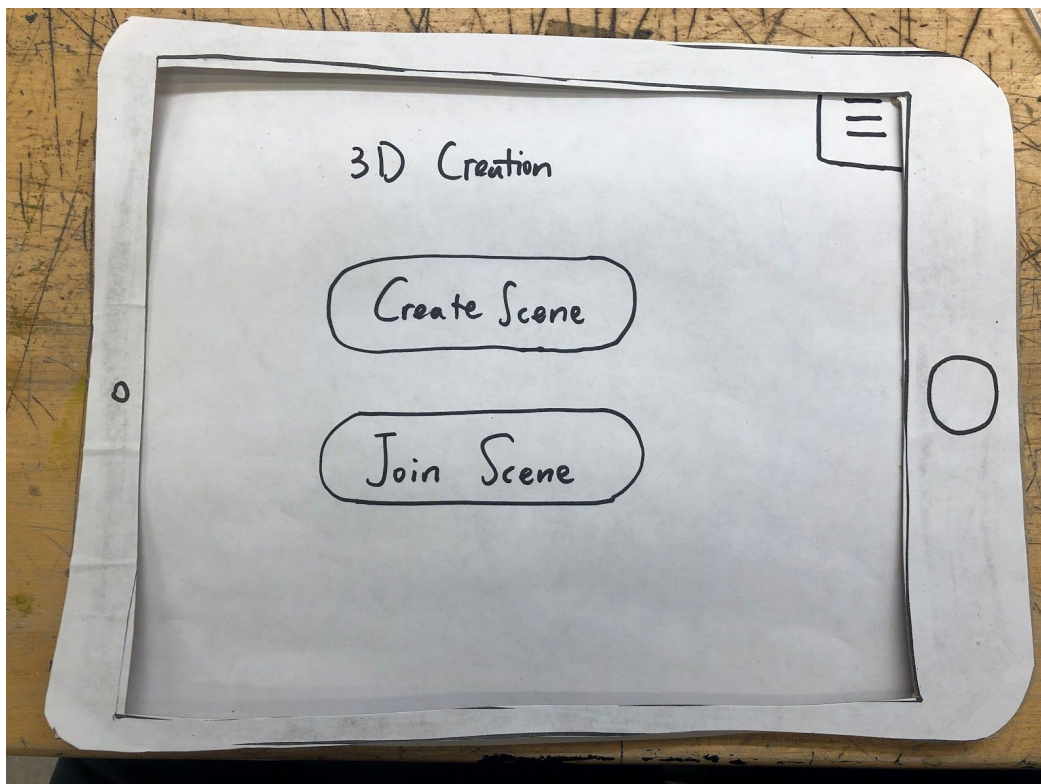


Jack moves his right hand and selects the "Add Asset" tab, clicks on it, and selects a sphere to import into the scene.

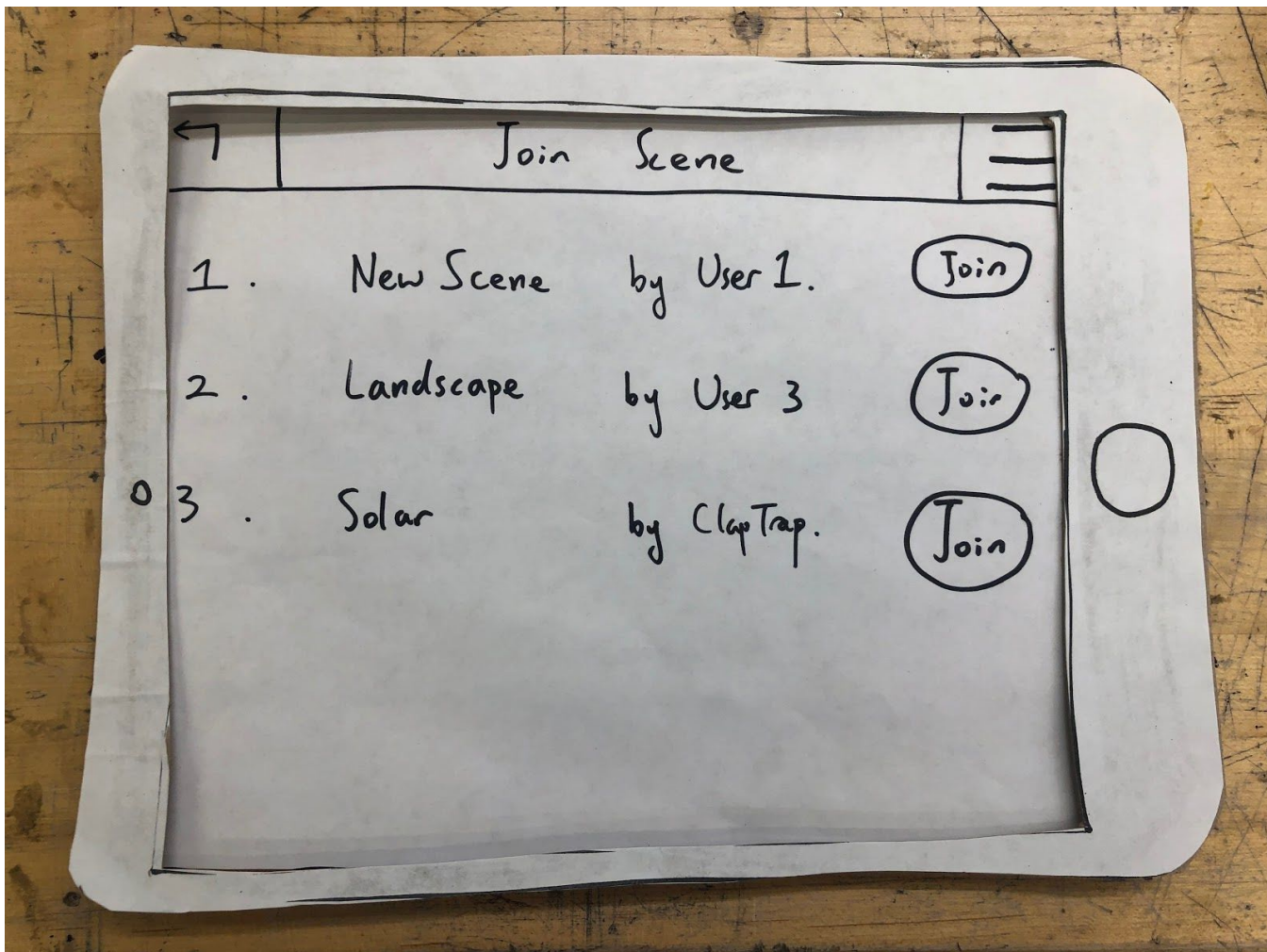


The app imports the 3D sphere to a location near the origin of the 3D scene. The sphere is initialized to a default size; Jack would like Tina to change the size of the ball to fit her design.

User 2:

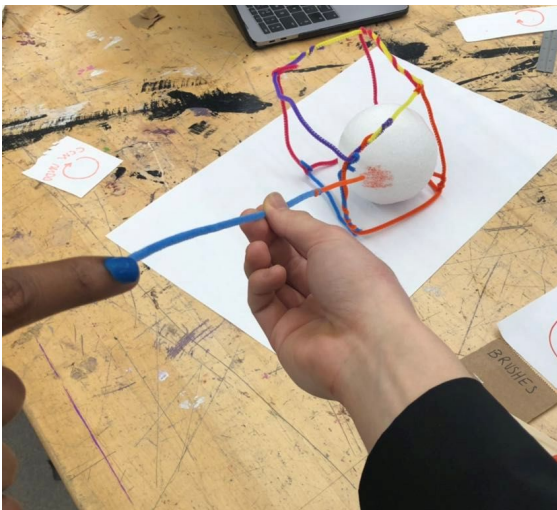


Tina (User 2) also opens our app on her phone. She selects the “Join Scene” button to join the scene that jack (User 1) has just created.



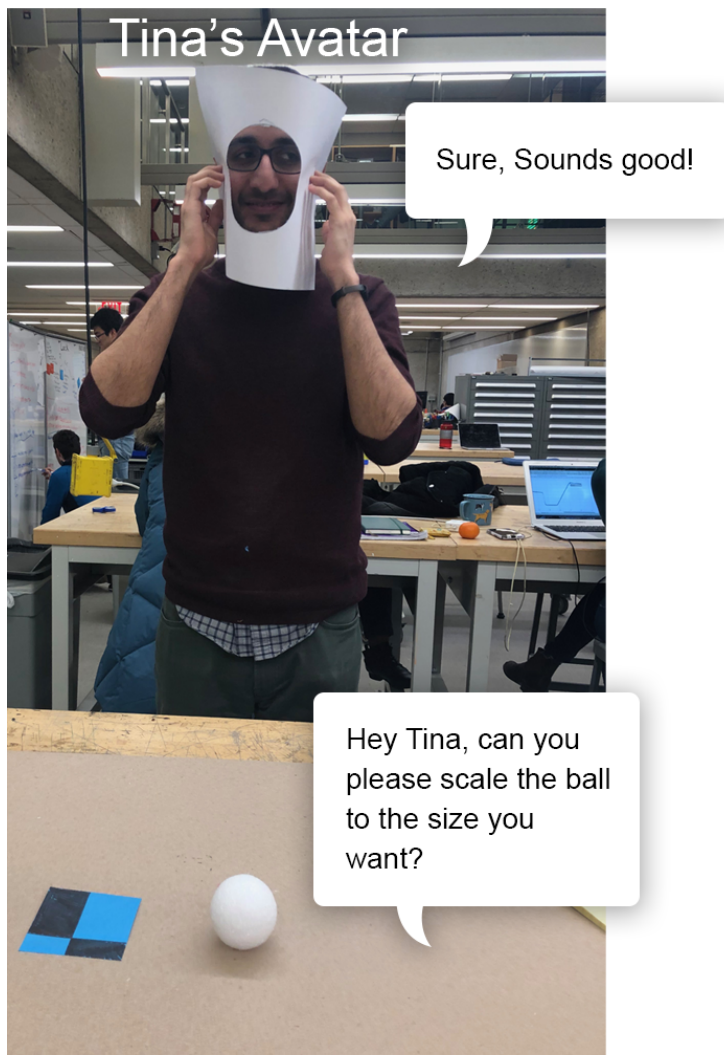
The app searches the nearby bluetooth signals for connection, and displays a list of 3D scenes created by people nearby. Tina clicks on the “Join” button next to the “New Scene” created by Jack (User 1) to join his 3D scene.

After Tina joins the workspace, she can select the ball using by pointing her finger towards it.



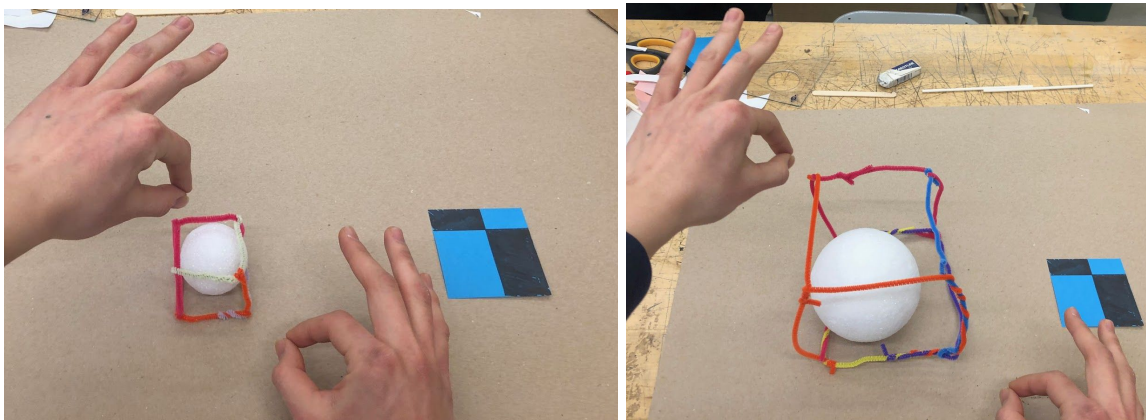
Collaboration

From Jack's perspective:



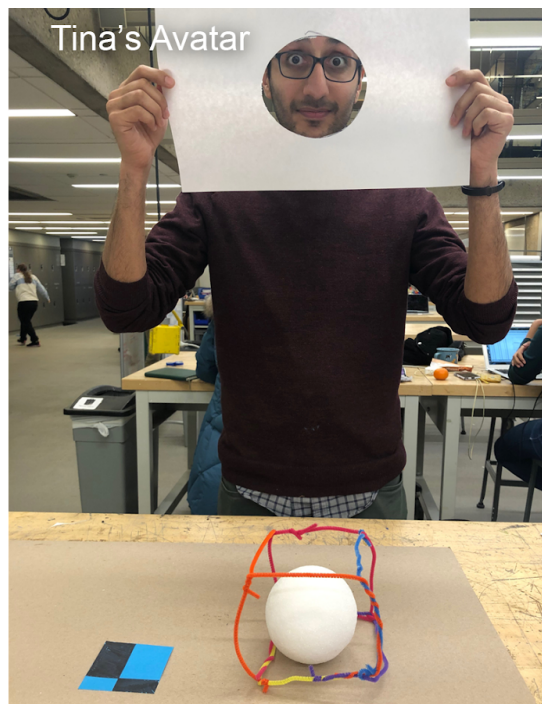
Jack sees Tina (a virtual avatar) joins the 3D scene on the other side of the workspace. He greets her and asks her to scale the ball to the size that she likes.

From Tina's perspective:



Tina selects the ball and a 3D box appears around it to show that it is selected. Then Tina picks two diagonal corners of the ball to scale it up using her gestures.

From Jack's perspective:



The ball is also scaled up in Jack's perspective. Through this process, Jack and Tina can collaborate on the same 3D creation project together.



1. User1 selects a ball.



2. User2 selects the same ball.



3. Git branch. The ball copies itself.



4. Two users can modify the ball.

While Tina is operating the ball, if Jack also wants to modify the ball, then he can select the ball and do "git branch" to create a copy of it.

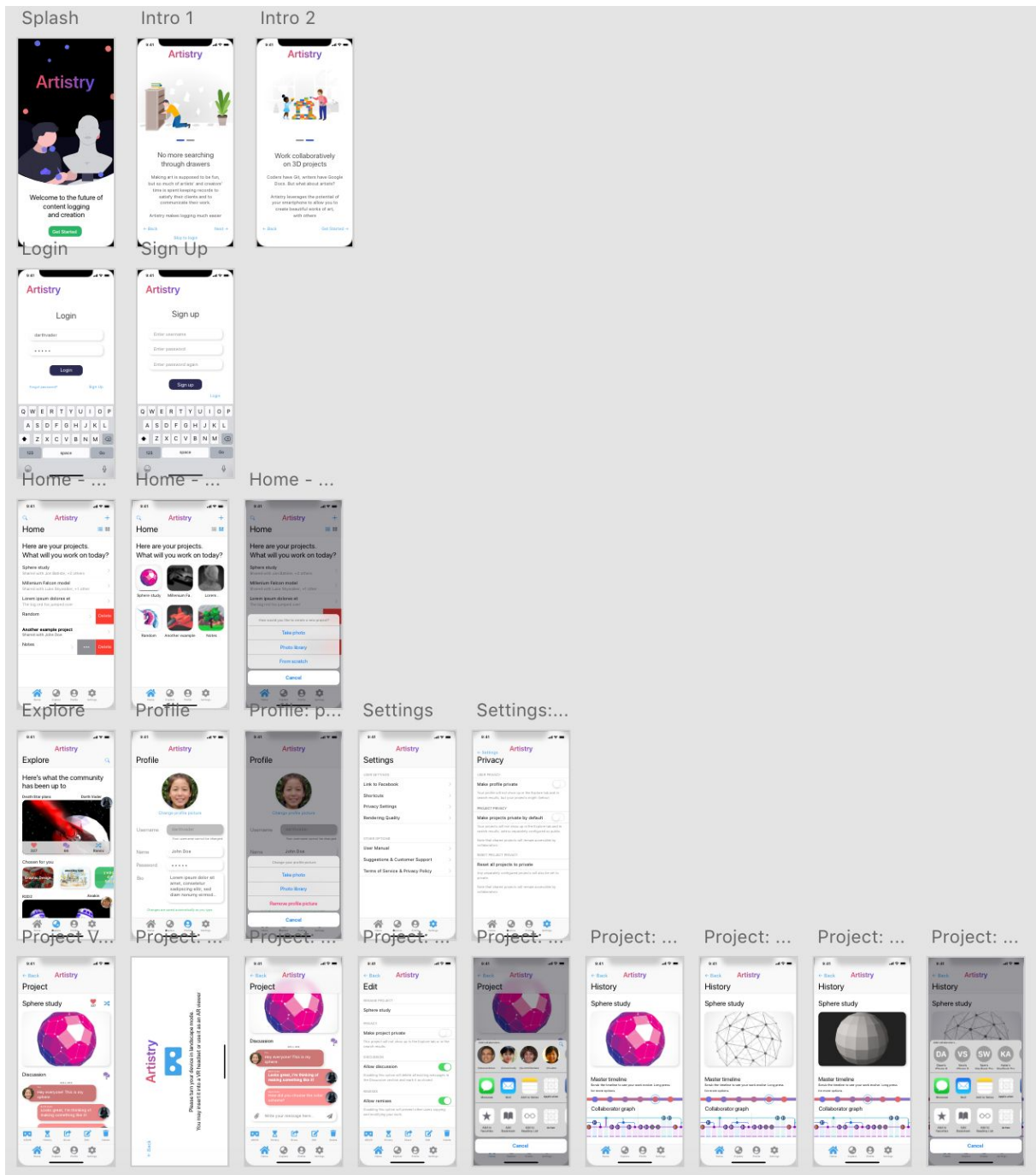
Design Mockup

The design mockup is based on Assignment 3e, and revisions were made to address the feedback received. The revisions modify the mockup and improve the documentation.

Mobile app

Overview Image

The overview image shows all the screens that comprise the mobile app. The app provides essential components of the experience: it lets users log their work, interact with other artists and provides basic editing features for their artwork. It also serves as the starting point for the VR experience.



Task 1: Logging artists' process

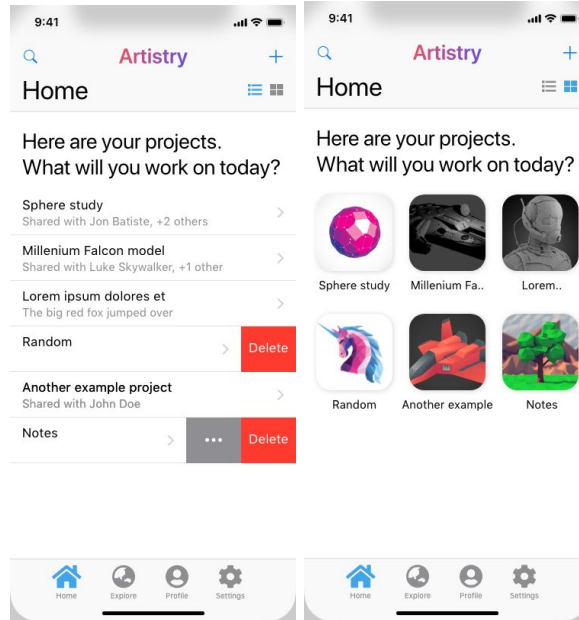
There are two ways an artist can log their process:

1. Creating many projects, each for a separate purpose
2. Using the history timeline for a project

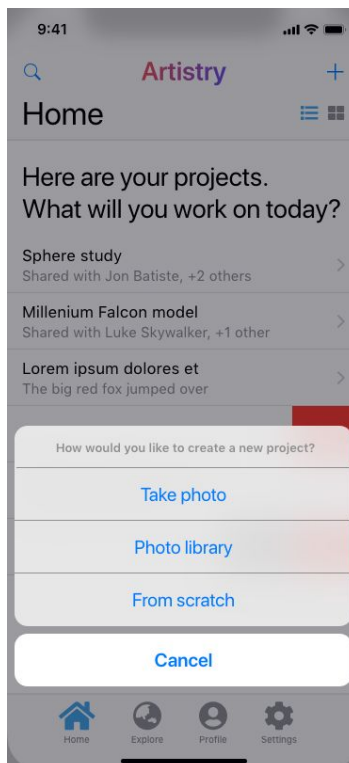
Both are documented below.

Step 1: View existing projects or create new project

After a user logs in (onboarding discussed separately below), they see a list of their projects. They can toggle between list and grid views. They can also search through their projects.

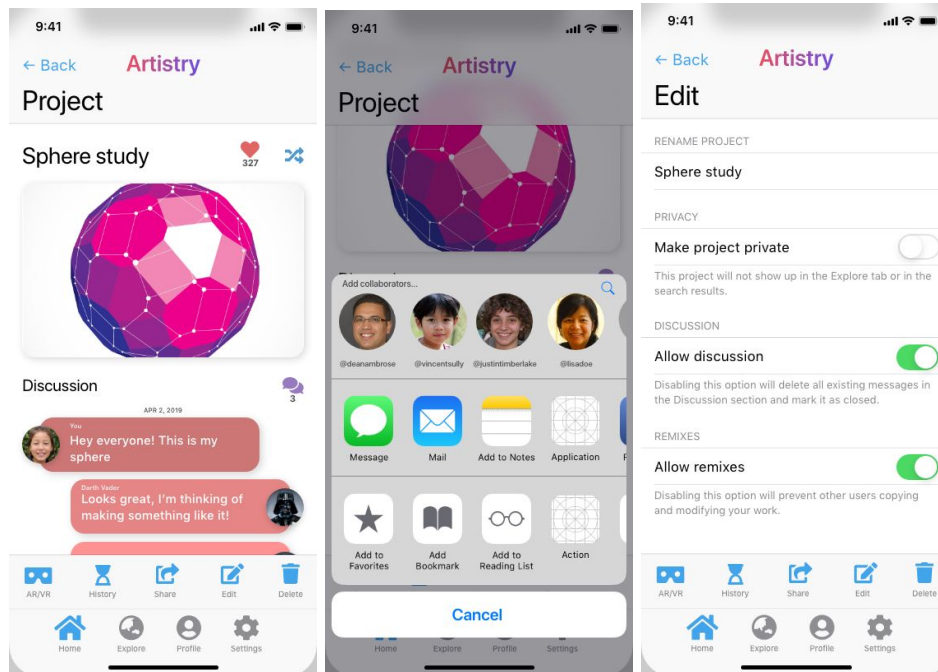


One feedback was that the rows without text (for “Random” and “Notes”) were confusing. This is because short and long swiping to the left (to show Delete and other options) usually pushes the text to the left. But we added the text back for clarity. A user can also create a new project from existing assets or from scratch by clicking the plus button:



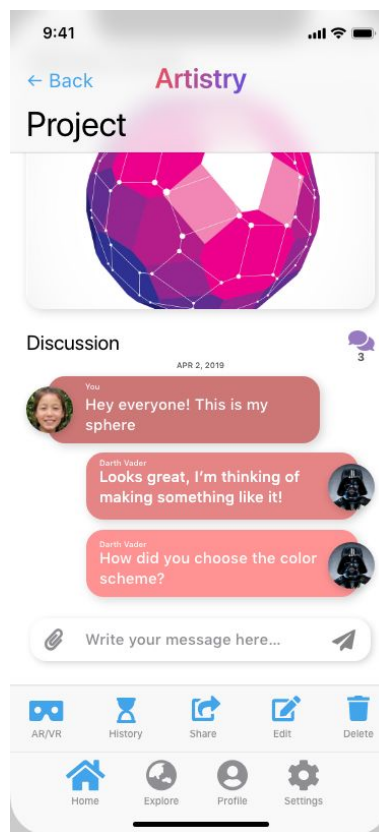
Step 2: Navigate to a project

The Project view allows deeper engagement with the project. For instance, the project can be deleted, shared (with collaborators or other services), hearted, remixed (copied to your own account) and edited. The Edit screen, modified according to feedback, now allows privacy modification on a per-project basis so that the project does not appear in the Explore tab (discussed later). Basic 2D drawing features may be accessed by simply clicking on the project image, although our real competitive advantage is the VR feature (discussed later).



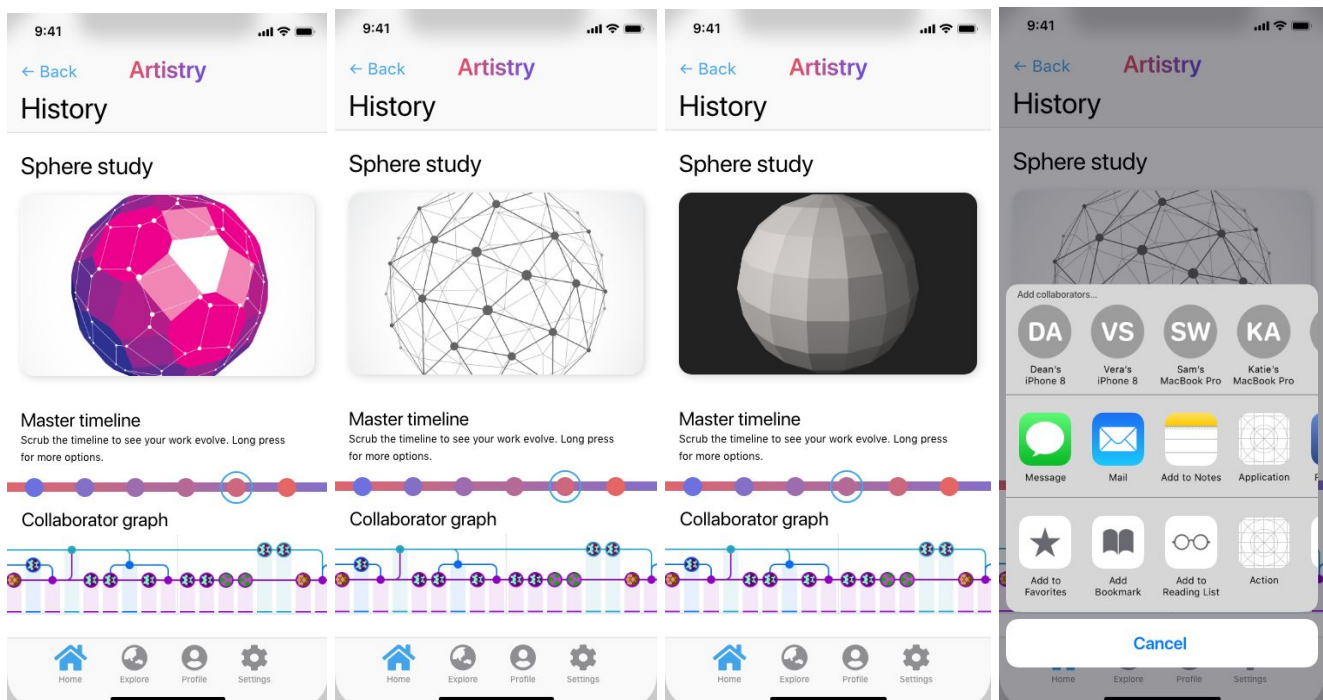
Step 3 (optional): Engage with community

There is a discussion section to engage with viewers and friends about your process when creating the project. Indentation and color were used to improve the experience. Left-aligned text represents the author of the project, whereas right-aligned is for viewers. The color grades from dark to light to represent newer messages (like iMessage). One feedback was how to add to the discussion. By scrolling down the section, the input is revealed. We decided to make this a hovering input so it is easier to spot.



Step 4: View project history

We consider the history feature essential for the logging process. The user can view a timeline of all edits made to the project, and also all the traces left behind by collaborators, visualized as a graph. The user can share each edit individually by a long press, or simply share the entire project (above) so viewers can inspect the timeline. The linear gradient color is used to make the timeline intuitive, and connects to the logo color scheme.

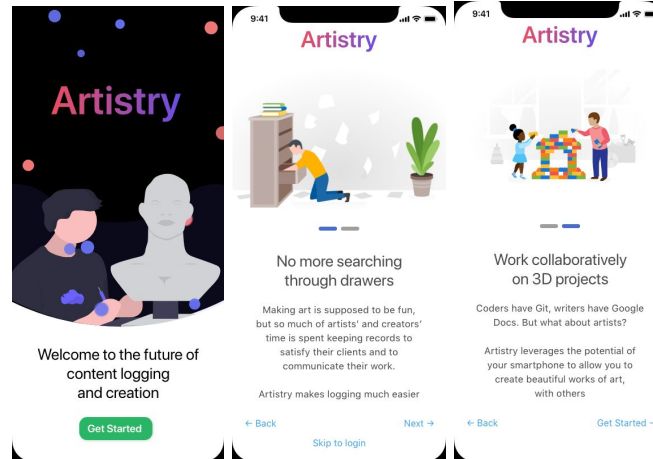


Other interactions and features

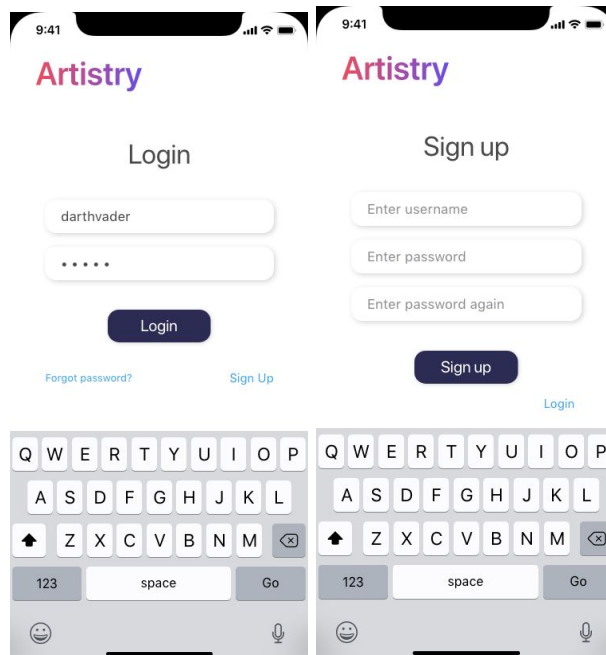
These interactions' purpose is to give a more holistic experience.

Onboarding

Welcome screens provide a gentle introduction to the user about its capabilities. We adopted this practice after looking at a variety of App Store apps that use the onboarding process instead of a more complicated manual. It is also based on Nielsen's heuristic #10 (help and documentation).



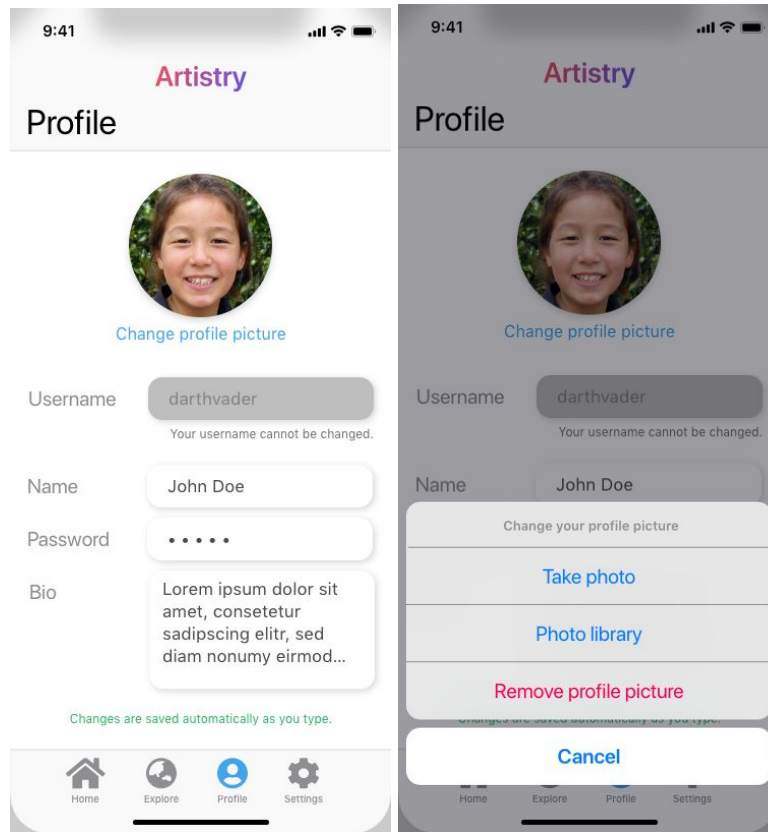
For experienced users re-downloading the app, we have provided a “Skip to login” link so they can login immediately. New users can toggle the screen to sign up. The reason we implemented a user credential system in the first place is because we want users to interact (give each other feedback, collaborate in VR etc.)



We kept the sign up process simple, only asking for a username and password, so that onboarding is easy. For adding more details such as a profile picture, we have provided the Profile and Settings tabs (below). Lastly, we have included “Back” and “Next” links throughout the screen, so that the design conforms to Nielsen's heuristic #3 (control and freedom) and provides the necessary exits.

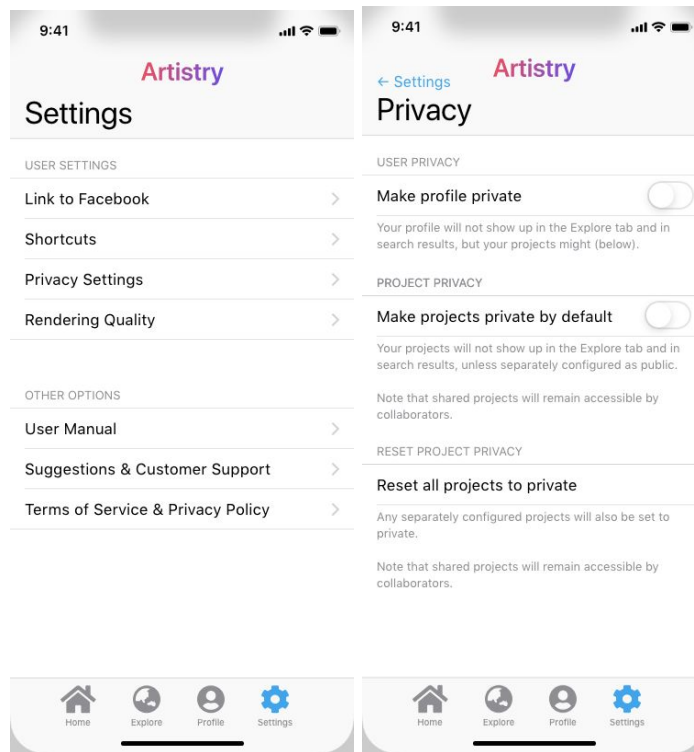
Profile and Settings

The Profile tab lets the user add supplementary details such as a profile picture, full name and a bio. To address the feedback about the confusing profile picture buttons, the buttons were replaced with a single, clearer link. Clicking the link shows the relevant options. This interaction is common to many other apps such as Instagram, so we decided to copy them. This also conforms to Nielsen's heuristic #4 (consistency and standards).



The username cannot be changed since it is unique in the database. However, we do provide it as a disabled field for reference. The other fields are mutable, and we inform the user that changes are saved automatically as they type so that they do not have to worry about data loss if they forget to save.

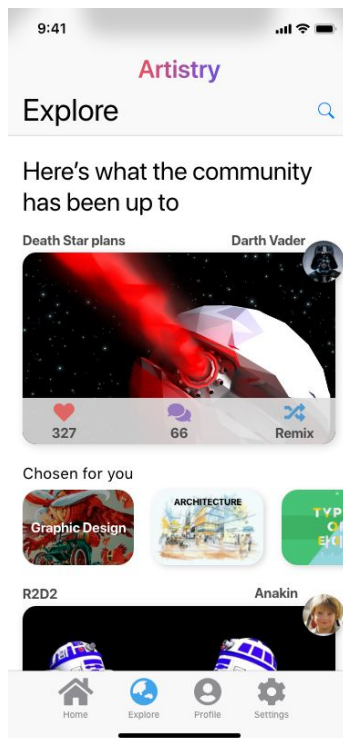
The Settings tab provides other options to fine-tune the user's experience. For instance, Rendering Quality can be set for VR mode. There is also a manual to provide an in-depth tutorial about the app's features. We have not made screens for these sections because they are implementation-dependent.



There are also some Privacy Settings. We thought it might be tempting to keep things simple and have blanket-controls e.g. all projects private or public, but not both. But to address the feedback about project privacy, we added a screen to 1) let the user configure some privacy defaults, 2) retroactively modify project privacy. Project privacy can also be set on a per-project basis (discussed above).

Explore

The app already encourages collaboration and discussion. But we also have an Explore tab where users can search and discover usernames and projects which pique their interest. There was some feedback about project privacy, which we have addressed (above).

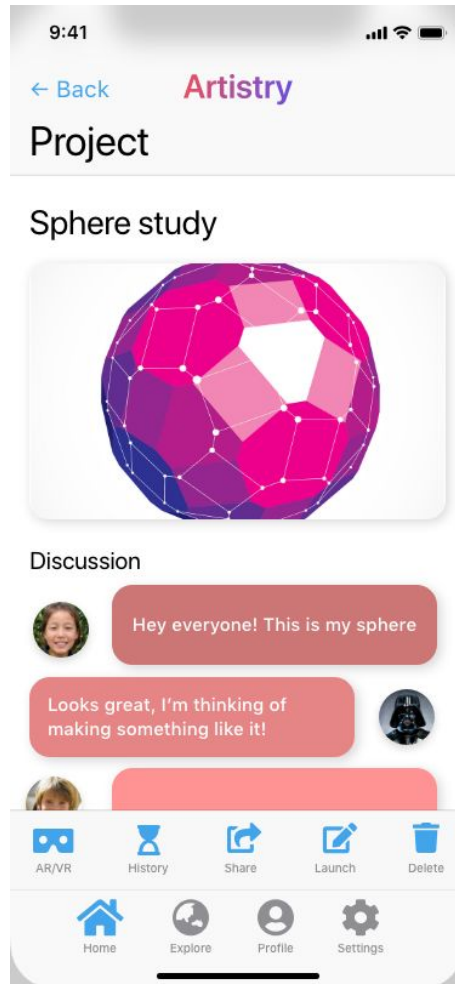


AR/VR

Task 2: Content creation when mobile

- The app lets you edit artwork in 2D using the Edit button
- The app also allows you to create 3D artworks with your collaborators. The following screenshots show the 3D content creation process.

Step 1: User 1 launches a new project



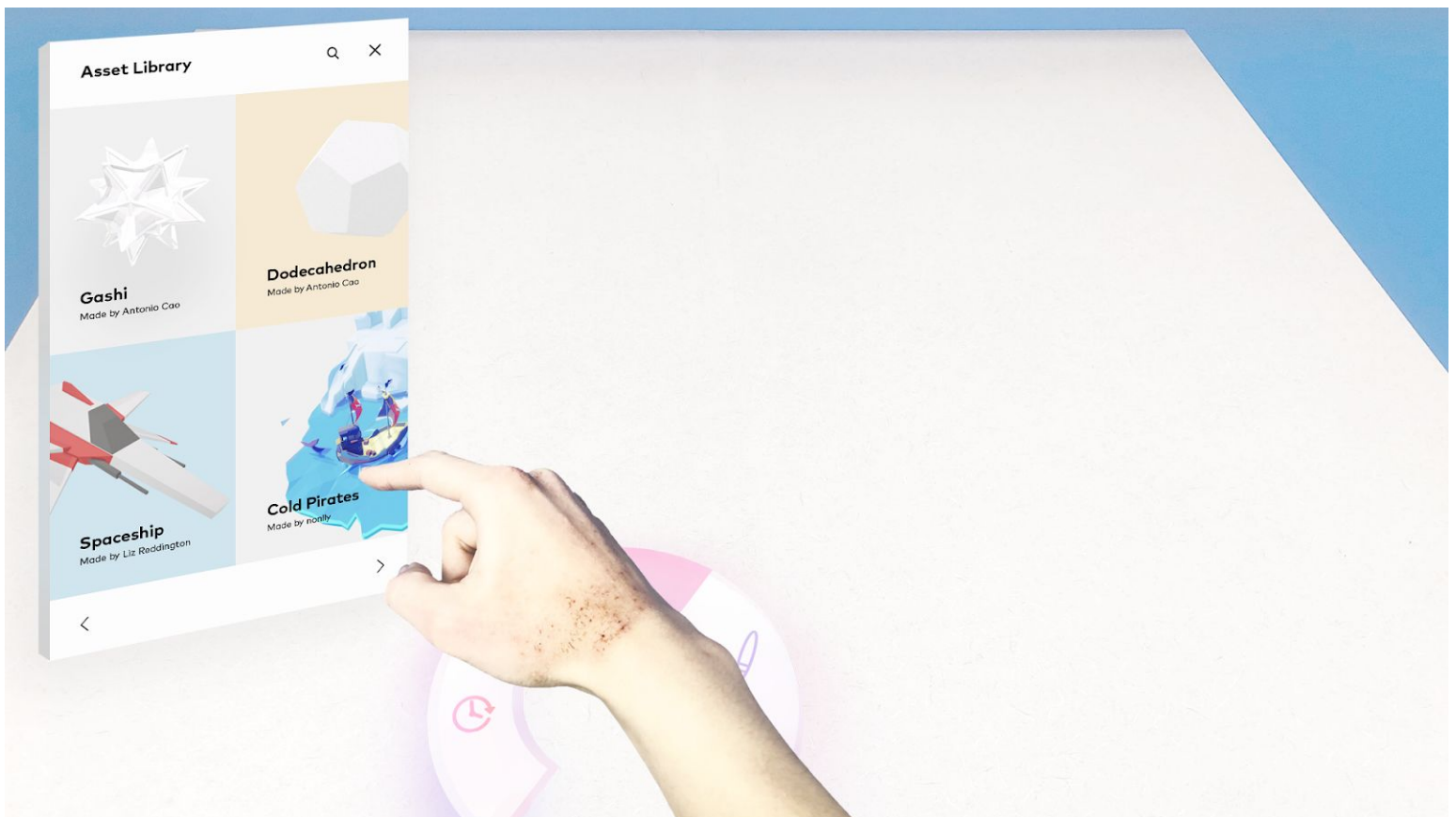
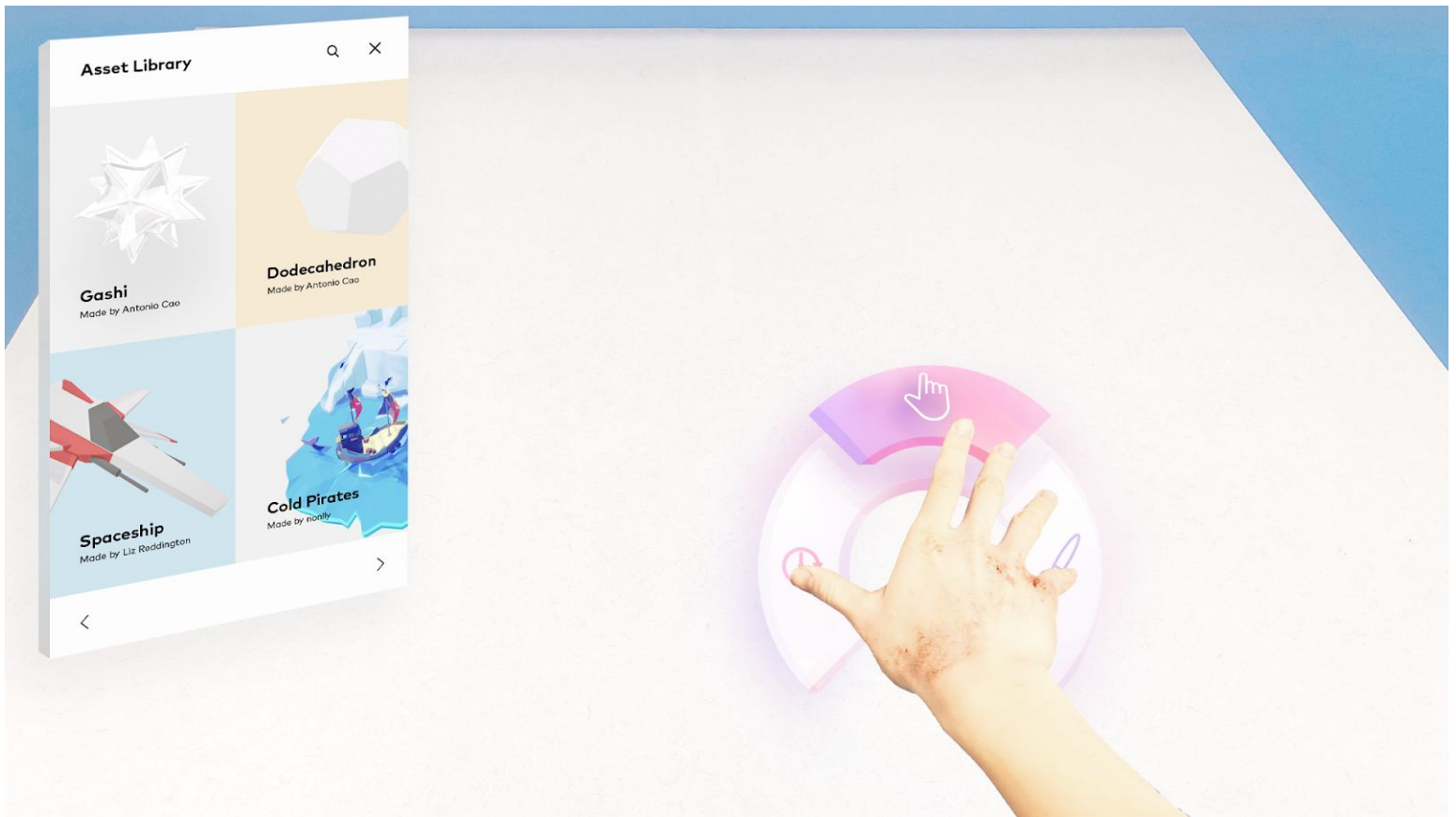
Artistry



Please turn your device in landscape mode.
You may insert it into a VR headset or use it as an AR viewer

← Back

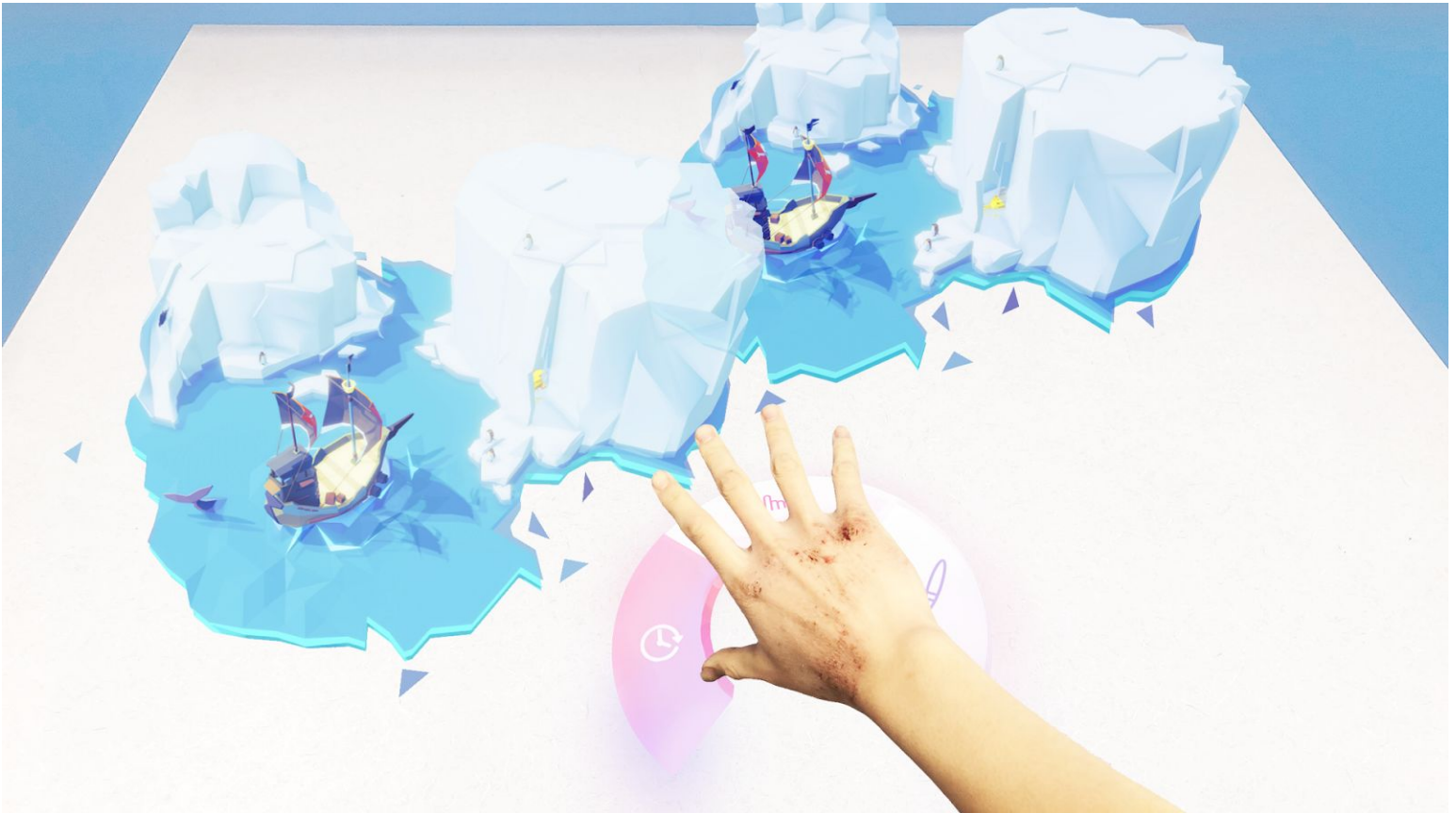
Step 2: User 1 imports an asset from the Asset Library.



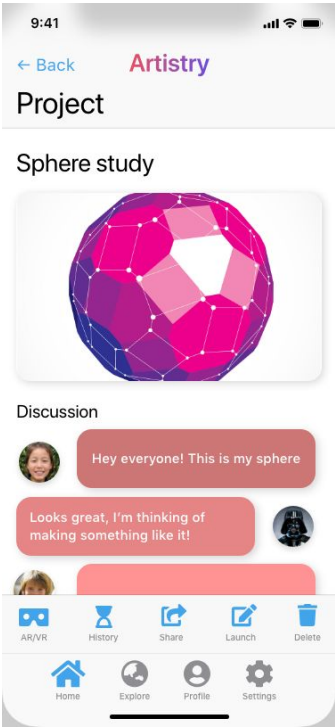
Step 3: User1 places the asset onto the workspace



Step 4: User 1 modifies object's history



Step 5: User 2 also launches the project via the same Project screen, and starts 3D content creation the same way as user 1.



Artistry



Please turn your device in landscape mode.
You may insert it into a VR headset or use it as an AR viewer



← Back

Step 6: When two users are modifying the same content, the app automatically makes a copy of the object, allowing both users to modify the object without conflict.



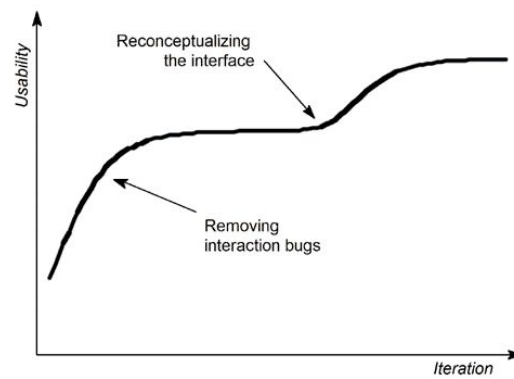
- We changed the “back” on the menu button to “history”, which is more useful and intuitive for our user, based on feedbacks gained in the usability test.
- In addition, we decided to make the selected menu option become much more apparent (by using a combination of highlighting and a 3D illusion to make the option appear higher than the rest).

Discussion

What was learned from the process of iterative design?

We learned that as engineers and designers, we have blind spots which introduces flaws into interfaces. These can only be uncovered by a steady process of research, usability testing and refinement. The “fixes” cannot be superficial, they must actually solve the problem, which makes the next iteration even more crucial.

There is a great graph on the NN Group website, which reminded me of the Design Right vs Right Design concept.



We are not able to get the design right unless numerous iterations and feedback reveal our hidden assumptions, even questioning whether we have the right design.

How did the process shape the final design?

Creating the low-fidelity prototype helped us test our assumptions about a potential interface from our design research. It was very useful in shaping the design quickly without committing us to a particular design. The heuristic evaluation and usability testing revealed critical interface flaws that we were able to rectify in subsequent paper prototypes. At the end of testing, we were in a good position to learn from our mistakes, and use that to create the mockup. Since our interface is naturally divided into an app and VR component, we were also able to separately refine each interface which helped with division of labor and quick prototyping.

The high fidelity mockup forced us to make concrete design decisions. For instance, we had debated how we were going to show contextual information (such as Edit, History, Delete etc.) for each project. We wondered whether this information would exist instead of or together with the tabbed navigation. But after consulting common UI/UX practices, we decided to put them together. Similarly, while our initial mockup of our “menu ring” in AR/VR consisted of more options, while creating the high fidelity mockup, we realized that having such precision in hand tracking and interaction design would not be effective for something virtual and not tactile. Thus, we considerably simplified our menu system, which meant that the options presented would have much larger touch targets, as well as being less confusing for the average user.

How have the tasks changed as a result of the design process?

Task 1 was initially: “Logging artists’ process”. Our first thoughts were to give artists a sort of notepad that they could fill up with ideas and inspiration. But we realized after interviewing, testing and gathering feedback that artists instead want the process to be logged automatically without much effort on their part. So we instead empower them with a history timeline and robust sharing features, so they have access to every stage of their work.

Task 2 was initially: “Content creation while mobile”. However, our design heavily emphasizes collaborative and 3D content creation when mobile. The reason for this is two-fold. First, 3D editing is an underserved market. Secondly, most professional design is collaborative - developers have powerful collaboration tools, so why not artists? Our dual app and VR interface specifically caters to this niche. The app allows inviting collaborators to projects. And the VR interface helps users deal with common collaborative problems such as merge conflicts.

Could more iterations help the design?

Yes, they definitely could. With a high fidelity prototype, we can better communicate our rationale between ourselves, interface experts and usability testing participants. They will also interact with it as if it was a close-to-finished product. Closely observing their behavior will reveal a lot of information about which specific interface elements are confusing.

Therefore, more iterations could help us fine-tune the interface, or reveal new opportunities for innovation. This cannot always be achieved with a low fidelity prototype where so many details are being actively debated.

Appendix

Assets attribution

- Photos of people from ThisPersonDoesNotExist: <https://thispersondoesnotexist.com/>
- Icons from FontAwesome: <https://fontawesome.com/>
- iOS UI from Apple's Human Interface guidelines: <https://developer.apple.com/design/resources/>
- Illustrations from Icons8: <https://icons8.com/ouch>