SWEN303

Assignment 2 – Ideation and Design Task

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Part 1:
Description:
AR Entertainment is an augmented reality application for mobile devices. Powered by Unreal Engine, the application works by recognizing imagery from the device's camera, mainly posters, and then rendering a 3D diagram on the users screen related to the imagery using image tracking. Created by the faculty of engineering, it's intention is to get high school students interested in a degree in engineering or computer science at the university.

UniteAR is another mobile application that works in the same way AR Entertainment does. It associates a 3D diorama with a 2D images, and renders the diorama when it recognizes the image on the users camera. Its given example is recognizing a pizza shop menu and then rendering the food over the poster in 3D.

The faculty of engineering needs to create more engaging methods of marketing to engage potential future students, as other university's will also be bidding for these students attention. The application will need to both educate the students on what is involved with the degrees, but also keep them entertained so that the information provided sticks with them. The application need to be simple to use and have a level of interaction that makes it entertaining, striking a balance between being a game and not just being an information overload. The application could also be used as a way to measure the amount of potential students courses may receive. The income of the solution is high school students in their final year enrolling for a degree in the faculty of engineering.

This system is an a more engaging method of providing high school student with what's available with the faculty of engineering. They'd be able to easily use the system to learn more about what's available at the university with a level of interactivity that would be available from just a poster on its own. The system is useful in communicating information and marketing courses in a way that is more efficient and more interactive then other mediums.

Model Overview:
The persona generation techniques I used were the ones described by CxD Principles and Practices. It involves breaking the persona down into five sections. Profile, Goals and Tasks, Anxieties and motivations, frustrations and concerns, needs and expectations. I used the profile to create two kinds of similar personas, because the user base for the app is going to be very similar. I used the goals and tasks section to present what it is these users wanted to do, and what tasks the app would need to fulfill to be useful for these users. Anxieties were to help show what the system could alleviate from the user, and motivations to be something to draw the users in, an example being what was shown on the poster. Frustrations and concerns were used to show problems that users could have with the system that was already in place, that being the faculty of engineering's existing marketing. Needs and expectations were used to show what these users would expect in terms of the overall experience with the app.

Since the systems primary user group was high school students interested in engineering and computer science degrees, and I and my friends were once in that demographic, identifying personas wasn't too hard. I simply reflected on what my thoughts and feelings were back at the time, as well as asking friends what they went through as well. With that information, I could make out two groups, those who knew exactly the kinds of programmes they wanted to get into, and those who were much more on the fence about what programme they wanted to do. I then created personas from these two as I thought they would work well with the system, since the app is supposed to be half entertainment and half education, and each persona could focus more on one part of this than the other, to check that they both work well.

This method of making personas also played well into coming up with the tasks they would each have. Since Bill was going to focus more on the education side, it made sense for his tasks to reflect this, so he would generally be wanting to get more information from what the poster originally had available. As well as that, I also added what I last from asking friends that could have been end-users for the system. This was the fact that knowing and having a list of all the programmes with vivid descriptions of them was quite hard to find, so making this into a task for Bill seemed fitting. Dom's tasks were also easy to create because when I was looking to enroll, the demonstrations shown with the computer graphics degree are what pushed me to major in that. So giving him the task of wanting something that would capture his intrigue made sense, as well as the general task of wanting information, but to a lesser extent to what Bill wanted which is why it at the bottom of his tasks.

Part 2: Personas and Scenarios:

User's name: Bill
Type of user: Dedicated Student
Profile background:

- Male, 18 years old
- High school student
- Comfortable in using new technologies
- Is planning on attending a university
- Has looked into the programmes within the faculty of engineering available to him
- Is unsure of which course is the best fit for him.

Goals and Tasks:
His goal is to find out information about university programmes so he can find one that is best suited for him.
Tasks include:

- Find information related to the programmes available to him, that would aid him in enrolling in the right program.
- Enroll in a programme that he would benefit the most from, one that both challenges and interests him.

Anxieties and Motivations:

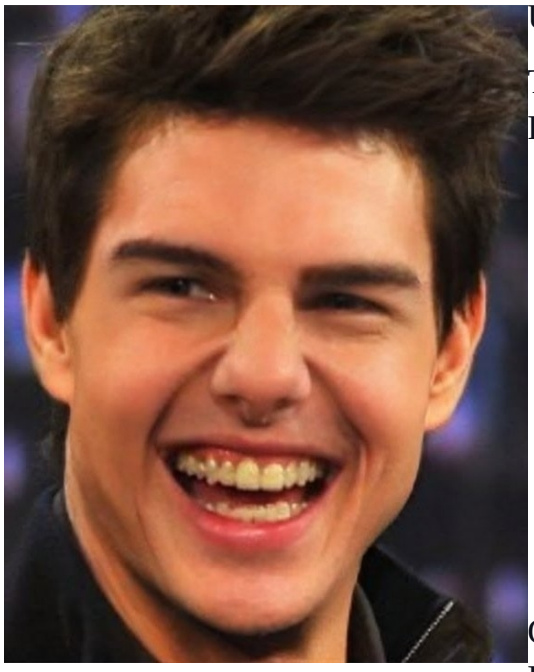
- Anxious about missing one of the options for programmes available to him.
- Motivated to look into every avenue of information that he has access to.

Frustrations and Concerns:

- Has to read through a lot of text to find worthwhile information about programmes, which isn't very enjoyable.
- Concerned he might miss out on a programme or course he might enjoy by not knowing about it.
- Might learn about a more interesting programme after he's already started a new one.

Needs and Expectations:

- Wants a system that will provide him with information about all the programs available with the faculty of engineering.
- Expects the university to have easy-to-use systems.



User’s Name: Dom

Type of user: Unfocused Student

Profile background:

- Male, 17 years old
- High school student
- Comfortable in using new technologies
- Is unsure of whether or not he will attend University
- Has barely looked into the programmes within the faculty of engineering available to him
- Is unsure of which course is the best fit for him.

Goals and Tasks:

His goal is to find out which field of study interests him before he reaches his final year of high school.

Tasks Include:

- Finding a programme at the University that engages with him and takes his interest.
- Finding an engaging method of learning about these programmes, that demonstrates the kind of activities they involve.

Anxieties and Motivations:

- Anxious about not finding a programme that can hold his interest, and enrolling in the wrong one.
- Motivated to find a programme that does interest him.

Frustration and Concerns:

- Finds reading through webpages/brochures boring and uninteresting, and feels they don’t have a good representation of what the courses involve.
- Hasn’t been able to view in-person University demonstrations and has missed out on things that might intrigue him.
- Is unable to find more interesting course-related material via University websites.

Needs and Expectations:

- Wants a system that can hold his interest and show interesting and complex course-related material interestingly.
- Wants a wide range of representation of what’s available from the courses offered by the university.

Scenarios, Usecases, and Journey:
Scenario Name: Cybersecurity information poster.
Personas Involved: Bill
Scenario Description: Bill uses the AR Entertainment app on a poster advertising a cybersecurity degree.
Scenario:
While Bill is heading to one of his classes at high school, he walks past a poster that catches his attention. The poster is an advertisement for the fields of cybersecurity from the faculty of engineering at Victoria. The poster is eye-catching with a large picture of the earth and has information about the numerous fields of cybersecurity below it. After Bill is done reading the information, he notices that the poster promotes the use of the AR Entertainment app, and has a link to download it.

Bill enters the link into his browser and gets redirected to the Apple app store, where he can download and install the app. Bill then stands back from the poster and lines his phone's camera with it while the app scans it, and once it’s recognized the app renders the contents of the poster in 3D on Bill’s phone.

From the poster comes a large-scale 3D model of the earth, which Bill can either move around physically or spin around with the touch screen of his phone. On the earth are tappable points that show the different areas of cybersecurity, and how they are effectively used around the world. After tapping on one, the screen of Bill’s phone is filled with interesting information about the areas, as well as links to courses within the faculty of engineering that teach the skills used in these areas, such as the cybersecurity course on cryptography. Bill eagerly cycles through all these points on the globe and reads all the information provided by the app.

The initial information provided on the poster, as well as the extra information provided by the app that wouldn’t have been able to fit on the poster, has provided Bill with plenty of information related to the one programme. Bill feels like he has a strong idea of what that program specifically offers, and the opportunities it would open for him in the future. After interacting with this poster, Bill scours the school looking for all the other AR Entertainment interactive posters, so that he can further educate himself on all of the programmes available by the faculty of science, interestingly and concisely.

Scenario Name: Robotics information poster
Personas Involved: Dom
Scenario Description: Dom uses the AR Entertainment app on a poster with a space rover on it.
Scenario:
While walking through a corridor at his high school, Dom sees a poster from the faculty of engineering at Victoria. Dom is drawn to the poster by a large picture of a space rover, and the promise is written under it of an interactive experience provided by the AR Entertainment app, rather than the text about the programme written below the image.

Dom enters the short URL that is written on the poster into the browser app on his phone, which then redirects him to the google play store page for the AR Entertainment app. After a quick download and install, he opens the app and steps back from the poster, lining it up with the camera on his phone, so the app can properly scan it.

Once the poster has been scanned, the space rover rolls off of it and onto the screen of Dom's phone. Dom can walk around the poster, and the view of the space rover on his phone will correspond with this, showing a different view of the rover depending on where he stands. Dom can also tap the screen of his phone to interact with the rover, tapping certain parts popping them off, and giving detailed views of the internal systems, as well as a small blurb describing what the part does and how it works, as well as links to courses related to the system, such as linking to a computer graphics course for a camera related to image recognition for pathfinding.

Following up these interactions with the info blurbs helps Dom to learn about the courses available at the university with the faculty of engineering, and what programmes they're associated with. The system does this all while keeping Dom engaged by providing the element of interactivity needed to hold his interest, which helps him better process and understand the information he is reading about. From here, Dom might be able to make an informed decision about what he wants his area of focus to be, or he could continue to find other posters around the school and continue to engage with the app and what it has available.

Scenario Name: Half and half poster
Personas Involved: Bill, Dom
Scenario Description: Bill and Dom use the AR Entertainment app on a tablet together
Scenario:
Encouraged by a teacher to read the posters around the school, to get them more educated on what's available in tertiary education, both Bill and Dom approach one of the posters provided by the faculty of engineering. This one is a summarization of all the programmes available of the faculty of engineering, each divided into a little square. While it doesn't interest Dom as much as it does Bill, the poster says each square has an interactive diorama, which does interest Dom.

While Bill reads the small blurbs of text about each of the programmes, Dom enters the link into the class tablets browser, which redirects to the google play store where he downloads the AR Entertainment app. Once Bill is done reading and moves out of the way, Dom lines up the tablet's camera with the poster, which scans it and brings it to life.

The information squares pop off the poster and onto the screen as 3D cubes, and float around in a 3D space that could be navigated by walking around with the tablet or dragging them across the tablet square. Touching on one of these cubes brings it into focus, and fills one half of the tablet with further information about the selected program, while the other half is an engaging diorama related to the subject, such as an interactive lighting setup to show off what the computer graphics degree has to offer. So while Bill can engage with the material of the programme and what it has to offer through reading, Dom can do the same except through interacting with the dioramas.

The concentrated info cubes help Bill to learn of all the programmes he has available to him from the faculty of science in one compact way, without having to navigate a sea of webpages. With the cubes being draggable he can arrange them in his order of preference and can prioritize what interests him the most. The dioramas also help him to find the programmes that are the most challenging for him.

With having all the mini dioramas in one easy to access way, Dom can engage with all of the programmes the faculty of engineering has to offer, in a way that stimulates his mind and helps him to find the field that is the most interesting to him, and give him a better understanding of the content they involve.

Personas: Bill, Dom – Scenario: Information Poster – Expectation: Learning new information, Being engaged by the virtual content			
	Phase 1: See Poster	Phase 2: Scan Poster	Phase 3: Interact with Poster
Saying	Bill: There's a ton of information on this. Dom: Man that's really boring	Bill: Ok now I'll scan it with the app. Dom: Hurry up and scan it.	Bill: Now there's more information for me to read. Dom: Finally something interesting.
Thinking	Bill: There's a ton I can learn from this. Dom: There's nothing here that interests me.	Bill: This is very easy to do. Dom: Man I'm bored.	Bill: It's great I can read all this info while he can interact with the diorama. Dom: Whoa look at the cool robot arm.
Doing	Bill: Reading the poster. Dom: Reading the poster.	Bill: Scanning the poster. Dom: Watching.	Bill: Reading the information on screen. Dom: Interacting with the diorama.

Persona: Bill – Scenario: Information Poster – Expectation: Learning new information			
	Phase 1: See Poster	Phase 2: Scan Poster	Phase 3: Interact with Poster
Saying	Nothing	Nothing	Nothing
Thinking	This seems interesting, I wonder if there's anywhere I can read more.	If I scan this poster I can learn more about the different cybersecurity fields.	Man, there's more to know about these fields then I initially thought.
Doing	Reading the poster	Using his phone to scan the poster	Tapping the bubbles to read more about the fields

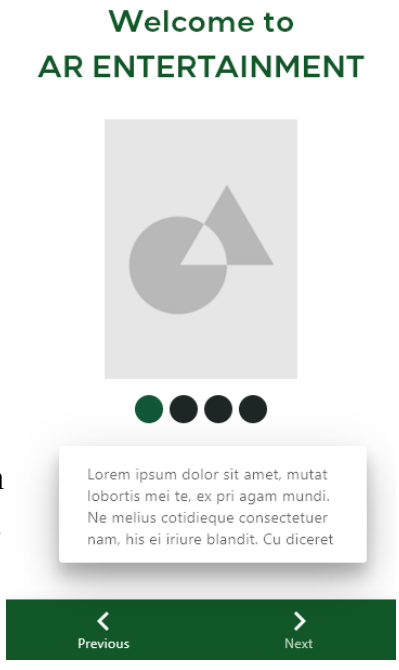
Part 3:
Design Page 1:
The app is intended for mobile devices, so I've based my design around the specifications of an android phone. It would remain the same on apple phones as well, but would have a slightly different UI scale on a tablet, due to the change in screen size.

Colour scheme:

Since it's an application made by the university to promote the university, it makes sense to use the university colors, that being mostly green. On the website, the middle green is used for selectable tabs while the darker green next to it is used for the selected tab, which I used for the bottom bar of the app. I occasionally used the far-right darkest green in place of the selected tab green, where color was much more important to distinguish things. These colors are also the same as the ones used for university branding on the posters.

Splash Screen:
Shown when the user opens the app on their phone, doesn't serve much purpose other than showing the user which app they opened.

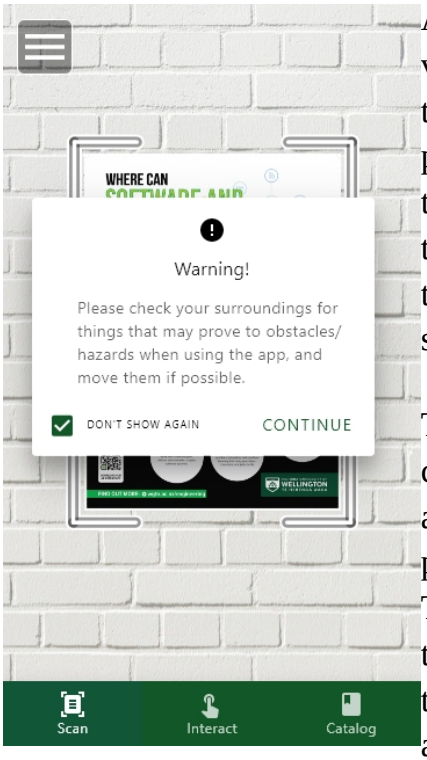
Tutorial Screen:
A tutorial page that would show the basic AR elements of the app, such as scanning the posters, moving around the objects, and viewing previously seen posters in the catalog. The placeholder image could either be just an image or a video demonstration of the app.



The balls indicate which page you're on, and allow easy access to previous and further pages. The bottom bar also allows you to go through pages and is kept consistent with the bottom bar seen throughout the rest of the app in style.

The tutorial screen would only be shown once on startup, but be accessible via the burger menu in case the user needs a refresher on how to use it.

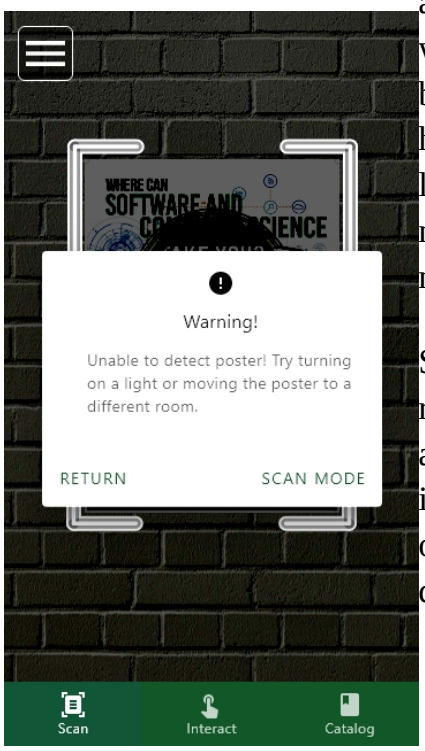
Scan Mode:



After the tutorial (or startup if the user has already viewed the tutorial before), the user would be taken to the scan page, which uses their camera to scan the posters. It starts with a warning for the user to check their surrounding for hazards before using the app since they'll be moving around, but a user whose going to use the app often can choose not to show this everytime.

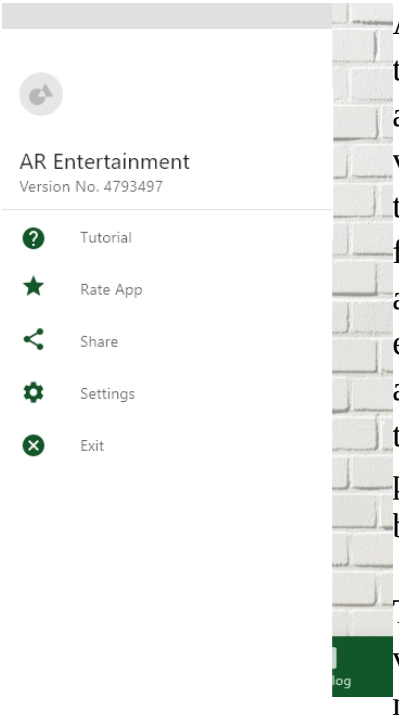
The UI elements that overlay the camera feed are the burger menu and the frame to line up the poster with for scanning. They're made up of white and transparent black lines, so that they can show up on all surfaces and not blend in.

At the bottom of the screen is the bottom bar, which is used to cycle between the three modes of the app. It uses the colors the tabs on the university website do, but since it can be a bit hard to distinguish between these it also greys out the logos and text of the inactive modes, while still having them be legible. The bar is at the bottom of the screen because that's the easiest area for a hand to reach when they're holding the phone, whether left or right-handed. While this means the app does have modes, the UI is consistent throughout them, to try and make it as mode-less as possible.

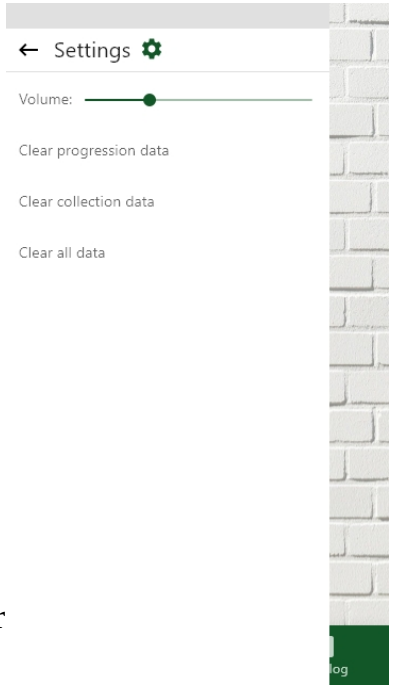


Since the app uses color data from the camera to recognize posters, it wouldn't work in the dark, and has a warning for when the environment is too dark and informs the user to move to a better lit area. The picture on the left also shows the UI on camera footage from a dark location, which works quite well.

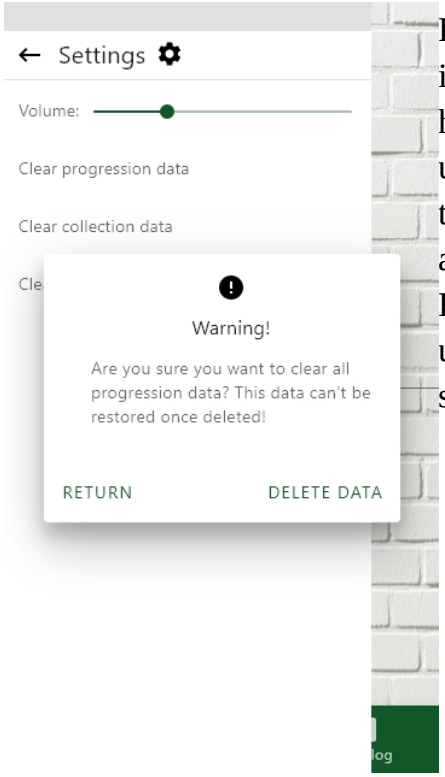
Burger Menu:



A simple menu that has options that aren't as necessary as the mode switching is to the user, so they can be hidden away and not always on display. From here the user can view the tutorial again, rate the app on whatever app store they downloaded it from, share the app store link the friends so they can download it, access the settings menu, and close the app. Share, rate, and exit would take the user either out of the app or bring up a system pop-up within the app, whereas settings and tutorial lead to different screens, tutorial being the same as the one shown on the previous page. It also has access to the version of the app in case a bug needs to be reported or something.

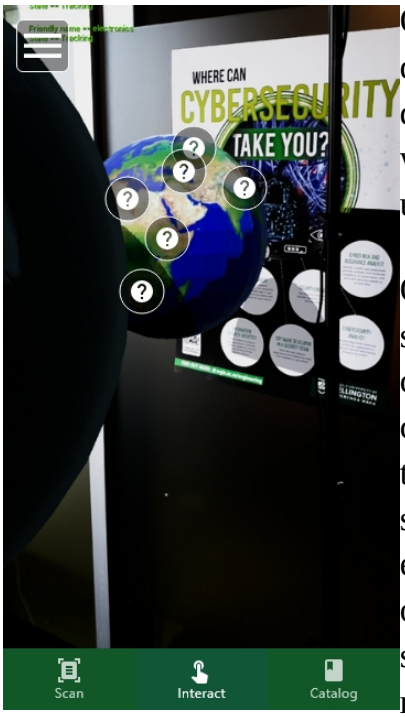


The settings menu can change the volume (in case the dioramas or menu interactions make sound), as well as deleting the data it stores broken down into multiple options, due to the fact the app could be installed on a device provided by a school the posters are put up at, and a student might want to "collect" the posters around the school themself or something.



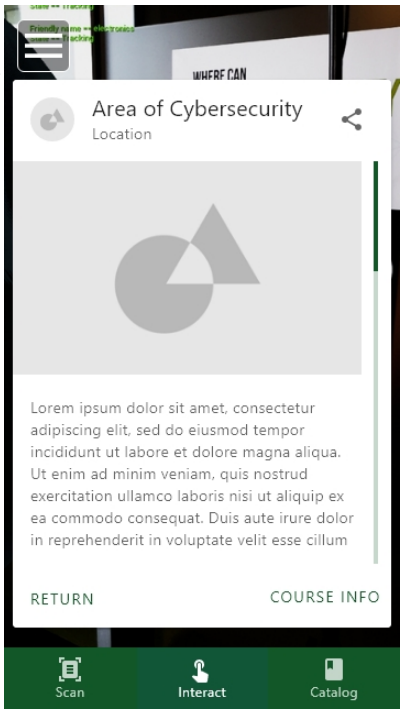
Progression data stores the interactions of the poster that have already been done by the user, while collection stores all the posters they've scanned. Clear all data clears both of these.
Each data clear option would have a pop-up warning the user of the specific data they're deleting, asking if they're sure they mean to do that.

Interact Screen, Scenario 1:

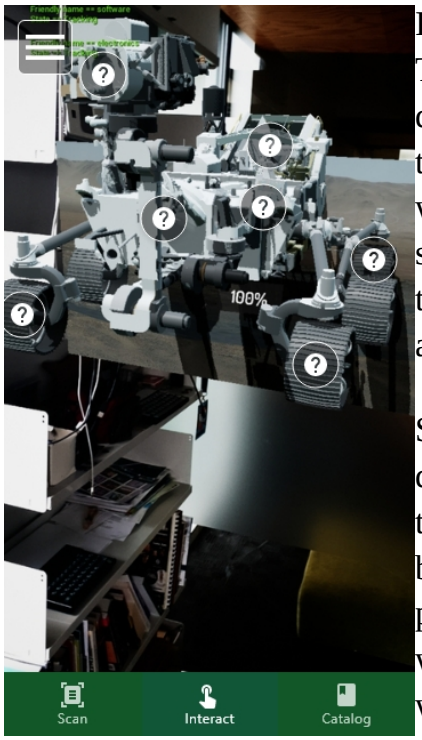


Once a poster is detected, the app starts to load the diorama in 3d space. Loading is shown by a ring, that doesn't show the progress of the load since I think that would be a hard thing to measure, but it's good to tell the user it's loading and hasn't gotten stuck.

Once loading is done, the diorama is displayed in the 3D space on the user's phone. In the scenario depicted, clicking on the circles shows a different area of cybersecurity from around the world. The buttons don't scale with the size of the earth, so no matter the size of the earth they'd be the same size as shown in the mock-up image, so that users can always press them. They use the same color scheme as the other overlay UI elements, which helps them stand out on any content they're overlaying as well as still be visible when they're overlapping.

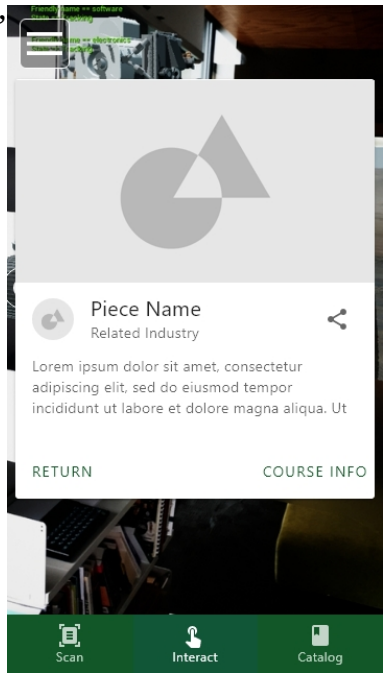


Once a button is tapped, the screen is filled with a card that goes into the detail on the area, that can be scrolled through to read more as indicated by the scroll bar on the right. There's also a share button to take the information out of this app and into another. From here the user can choose to return to the diorama or open a course page for a course at the university related to that area. If the user chooses to return to the diorama, that interaction will be marked as done with a checkmark, so that the user doesn't get confused and hit the same one again.

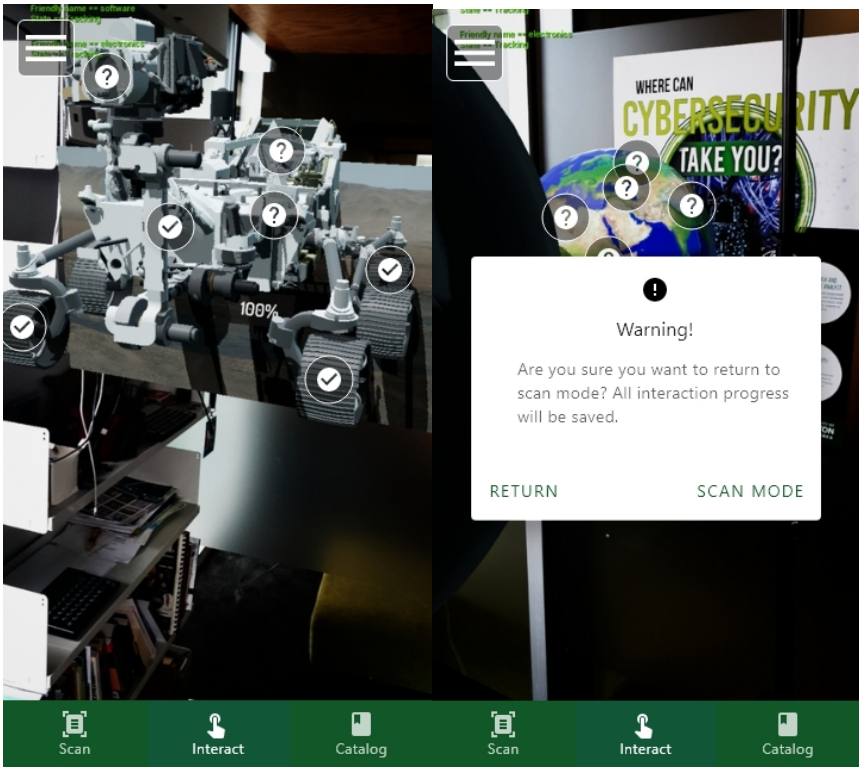


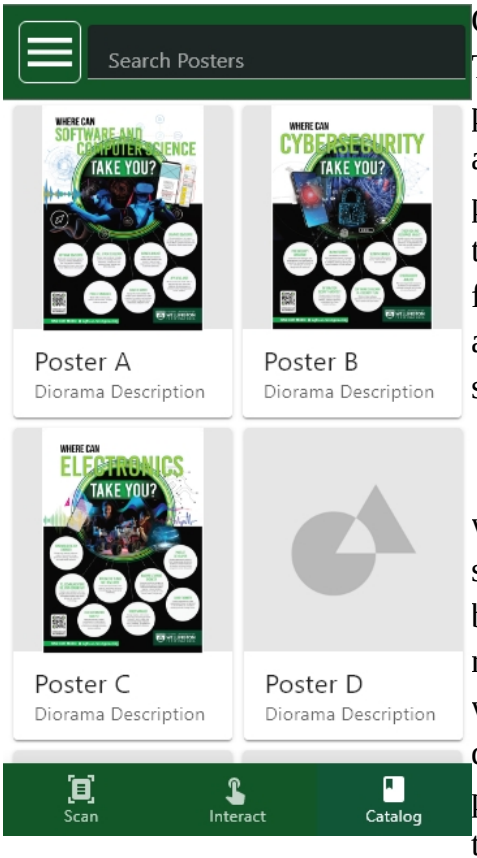
Interact Screen, Scenario 2:
This works in much the same way scenario 2 did, the only difference being the layout of the card is different, where the picture at the top would be an internal view of whatever piece of the rover was tapped. Since the rover some of the same pieces multiple times, like the wheel tread bits, tapping and reading one of those would mark all of them done, to cut down on repetition for the user.

Since changing back to scan mode would close the diorama, a warning message would be in place to warn the users of what they're doing, but also that their interaction progress would be saved. The warning message has clear writing on where the buttons on it would take the user.



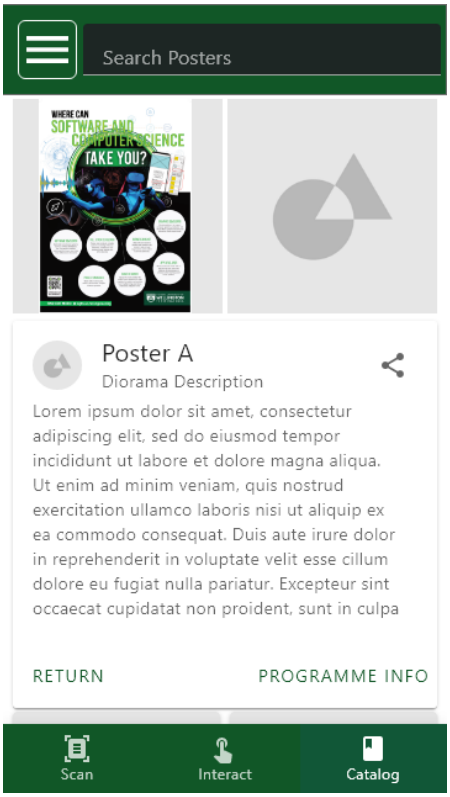
I don't have a mockup of scenario 3, because it's for a different device, but it would just be a mix of the screen with buttons and the text card screen, just one on either side due to the larger screen size of a tablet.





Catalog Screen:
The catalog screen would serve as a way to see what posters the user has and hasn't used the app on yet, and look at the diorama/ information from seen posters again. The user would be able to search through the posters by either the area the poster focused on or what the diorama involved. They could also scroll through the list to find a specific poster, or see which ones they haven't scanned yet.

They would then be able to read up on the poster, as well as share it and the information available with the share button. The blank image on the right would serve as a way to review the diorama on their phone, just without the poster and real-world moving around and inspecting. This would help users to find the information they need all in one space.



Part 4: Reflection:

Reflection:

Pros:

• The camera view takes up most of the screen, giving the user a good view of the diorama and giving them better use of their screen.
• Even though the UI isn't mode-less, it keeps uniformity across the modes, helping the user not to get confused when they switch between them.
• It has good error coverage and helps to inform them what they may be doing wrong in the app, which would be very prevalent with an app that uses image recognition.
• Has good additional features to further help personas with their goals, primarily the catalog feature.

Cons:

• Due to the fact it's a 3D app, having on-screen controls for navigating the diorama is tricky, and the fact it has to be on a touch screen is even trickier. When I tried the app UniteAR, it used two fingers to move and scale objects and didn't work very well because of it. My other choice was to implement a 3D axis controller like what you would see in a 3D modeling program, but using one of those o a touch screen doesn't sound easy, so I skipped on on-screen controls altogether.
• Since there are no on-screen controls for moving your view around, the user has to recall they can move around themself, which shouldn't be much of a problem but still isn't great. This is kind of elevated by the redoable tutorial.
• Dependant on the intractability of the diorama this interact UI may not be appliable to it.

What I learned about the problem by proposing a solution:

• Trying to find ways to navigate a 3D diorama with a touch screen feels impossible, and already existing implementations don't feel very good to use.
• It's difficult to design the UI for a program that is very reliant on the variable content it uses.
• Having unspoken guides on how to use a UI (like the scan brackets in scan mode) feels a lot better than just outright being told what to do.

I made no changes to my personas or tasks, as I was already content with them.