



# nAtuRe

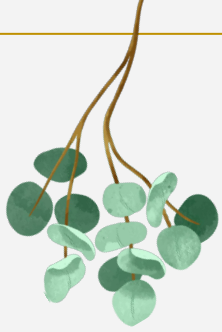
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By Shareen Esmail



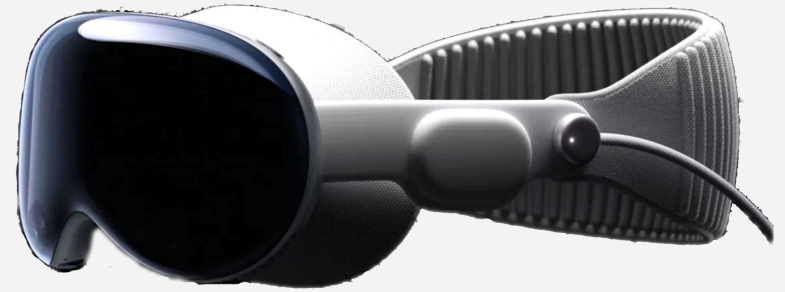
# What are AR Glasses

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## Merriam-Webster Definition for AR

an enhanced version of reality created by the use of technology to overlay digital information on an image of something being viewed through a device (such as a smartphone camera)



Apple Vision Pro AR glasses

## AR Glasses

AR glasses offer a hands-free experience of augmented reality (AR). These glasses serve as a tool for viewing and interacting with AR, maybe eventually replacing phones, as can be seen in media. We can already see many companies investing in them for the future like apple and microsoft.





# Research Framework

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What:

An AR lens that lets you more closely connect to the nature around you more intimately

Why for me:

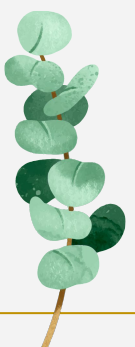

This is what I wanted to research for 4th year. General interest in AR subject and topic

Why for  
Everyone else:

To be able to identify different wildlife and plantlife in nature to deepen our connection with the environment

Who:

Anyone who wants to understand their environment. With a phone and space to download the app and with data or the ability to connect to the internet



# Ethics, Accessibility and Intention

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## Ethics

- Will scanning everything in public infringe on privacy
- How will this affect our connection with nature when there is a screen between

## Accessibility

- How will those with a disability be able to use it (visually impaired, dyslexia, ect.)
- Will every have an internet connection when in nature

## Intention

- To increase the connection between people and the wildlife around them
- To promote environmental awareness about invasive or native plant types

# Pro's and Con's

60%

## Pro's

- Educational
- Conservational
- Tourism
- Recreational



40%

## Con's

- Reliability
- Limitations
- Privacy



# Micro



## MicroInteractions

Educational Sharing  
Community Building  
Environmental Activism

## Example

Sam and Bernice decide to go hiking, to see who can find the most unique species of ivy.

## MicroAggressions

Generational Criticism  
Technological Dependence  
Nature Authenticity Doubt

## Example

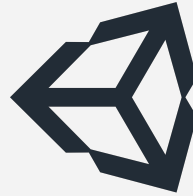
Mary Antoinette laughs at Jeff, as their AR glasses batteries die and they can no longer tell what mushroom is poisonous

# Different Applications



## Spark Studios

Very easy to pick up and learn. Lots of community around it.



## Unity

Easy to use and lots of variability.



## Unreal

To complicated and hard for me to explore



## Aero (Adobe)

To simple and not able to fully adapt to what I need





# Using the GPT

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**You**

how would someone go about making their own ar glasses



**You**

how come as soon as i open unity with the AR preset it gives me errors and asks me to enter safe mode





**You**

oki finally have what i think is a working setup of an AR scene in Unity, but when i export to my phone that is in developer mode with a usb connection. it is just a black screen



**You**

hey. if i wanted unity to recognize a tree in AR. like recognize a species of tree without having a picture of the exact tree... is it even possible?

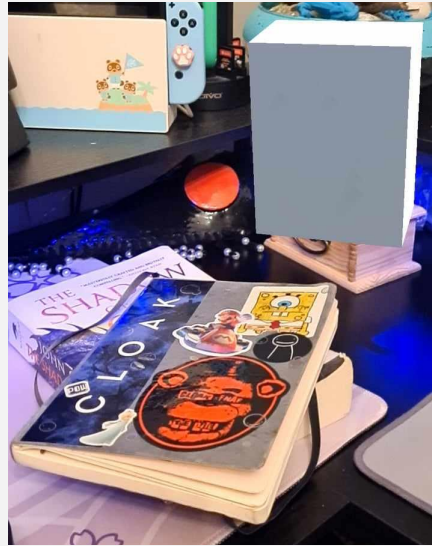


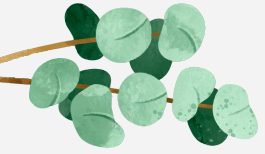


# Making the Prototype

## Image recognition

I found a tutorial that explained image recognition and replacement.





# Process



Please don't judge how messy my desk is



# Wins and Losses



## Wants

- A Google cardboard style AR glasses
- Able to recognize a specific type of plant or tree
- give a description
- Appear after looking at an object for a certain amount of time
  - Potentially with a loading bar showing it is currently scanning

## Wins

- Has 2 displays to mimic an AR display
- Able to recognize an image of a specific plant

## Woes

- Is blurry
- Only recognize a specific image of a plant, and not the species
- Never made/used a google cardboard to hold my phone in place
- Forgot that I wanted it to appear after a certain time
  - No loading bar

# Conclusion

## What I did:

- too much time researching on the wrong topics
  - how to make QR codes
  - make physical AR glasses
  - what program to use
- tutorial about image tracking in Unity much later
- explored several programs

## What I wished I did:

- teaching software to recognize a tree
- finding a way to connect Google Lens to my project





# Appendix Index



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## Initial Inspiration

The main idea and steps to achieve it

02

## Chat GPT & Exploring

My handy assistant and exploring AR



03

## Making the prototype

The final project and all the problems along the way

04

## Resources/ Conclusion

Thank you for listening!





01

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# Initial Inspiration

The main Idea and steps to achieve it






# AR MINECRAFT

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A multiplayer and fully interactive XR world that fully combines a virtual reality in an augmented setting.





# Is it Emerging

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## For Me

This is definitely an emerging tech in my opinion. Since it is rarely seen with the people around, or in the everyday and isn't talked about much



## For Others

Now while this is not common place in my life, that is not to say that it isn't being explored. The concept of AR glasses has been around for a long time, and you can even see similar products like it in movies (like Iron Man's Glasses). We also know that it is still a developing field because of companies like apple trying to produce the apple vision Pro hopefully by early next year.







# What to be worried for


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## Ethics

If AR glasses were to become commonplace, society would live with a screen between themselves and everything they ever interact with

## Accessibility

AR glasses should be accessible for everyone, whether they are visually impaired or physically challenged. Developers should implement thoughtful measures to ensure that individuals facing various disabilities can easily use and benefit from this technology




## Transparency

While wearing AR glasses, it should let you know when it is gathering information, for instance it should let you know if its looking for your hand signals

## Responsibility

AR glasses could be perceived the same way our phones do, taking up our entire existence until we are left unable to function without them. There is also a Privacy concern the same way a Google device might have. Where it is constantly listening for the key words of “hey google” it could be scanning everything in search of your activation movement

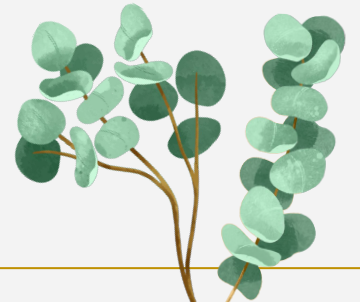




# 02

# ChatGPT & Exploring

My handy assistant and exploring AR





# Which App To Use?

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## Aero

Working with Adobe Aero for my AR app was both flexible and challenging. While it offered a range of options, getting the hang of it was a bit of a learning curve, as it's quite different from what I'm used to. Despite the initial difficulty, it almost became my top choice thanks to the abundance of helpful information available for the software.



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## Unreal

Exploring Unreal for my AR app presented its challenges. I had trouble finding tutorials around the subject and it left me navigating during my first encounter with the platform. Despite its evident flexibility and myriad options, the struggle stemmed from not having a clear starting point to seamlessly transition the project into an AR application."

# Why Chat GPT



 **ChatGPT**  
Certainly! To manually install the required packages for Google Cardboard development in Unity, follow these steps:

- Native Camera 1.3.7:**
  - Open the Unity Editor.
  - Go to the menu bar and select `Window > Package Manager`.
  - In the Package Manager window, make sure you have the `Packages: In Project` tab selected.
  - Click on the `+` button at the top left corner and choose `Add package from git URL...`.
  - Enter the following Git URL for the Native Camera package: `https://github.com/Unity-Technologies/NativeCamera.git`.
  - Click on the `Add` button.
- Google Cardboard XR Plugin for Unity 1.19.0:**
  - Similarly, in the Package Manager window, click on the `+` button.
  - Enter the following Git URL for the Google Cardboard XR Plugin:  
`https://github.com/googlevr/cardboard-xr-plugin.git#release/1.19.0`.
  - Click on the `Add` button.
- Set up XR Plug-in Management:**
  - Go to `Edit > Project Settings > XR Plug-in Management`.
  - Under the `Plug-in Providers` section, find `Cardboard XR Plugin` and make sure it's selected for both iOS and Android.

After completing these steps, you should have the required packages installed for Google Cardboard development in Unity, and the XR Plug-in Management should be set up correctly.

↓

Remember to save your scene and project after making these changes. If you encounter any

I'm really bad at asking questions, or I find that when I can actually ask the question that I need to ask, google gives me the answers that I am not looking for. So with Chat GPT I can ask my questions without fear of google not understanding me, because I can just clarify what I meant in the same google search so to speak. I also find that Chat GPT tends to walk me through the answers. Especial for this kind of project where I really wanted to build my product, but had no idea where to even start.



03

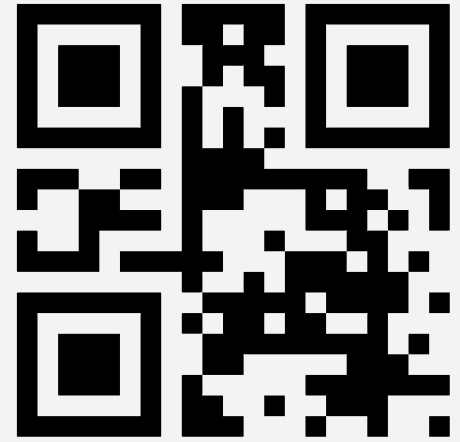
# Making the Prototype

The final project and all the  
problems along the way



# QR codes

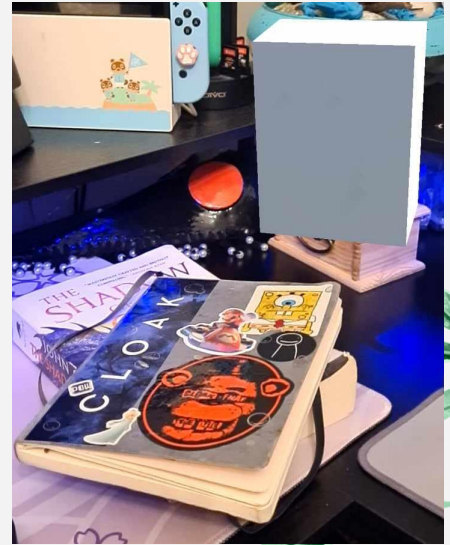
My original idea was actual to have a photo or 3d print a mushroom or mini tree that had a QR code on it. It was supposed to be that once I had the lens set up, you could just scan the QR code to display the image of information. This is obviously not how it went because after a bit of research I found out that Unity has an image tracking system. I then scrapped my idea completely because this new image tracking system was earlier to accomplish and it blended in with the environment so much better and smoother than a QR code would. I did find a way to make QR codes and barcodes however through Excel, and the few tutorials I found on that should be in my resources list.



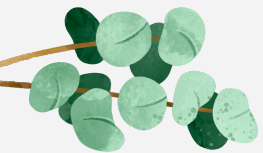
Do not scan, dead website

# Making the Prototype

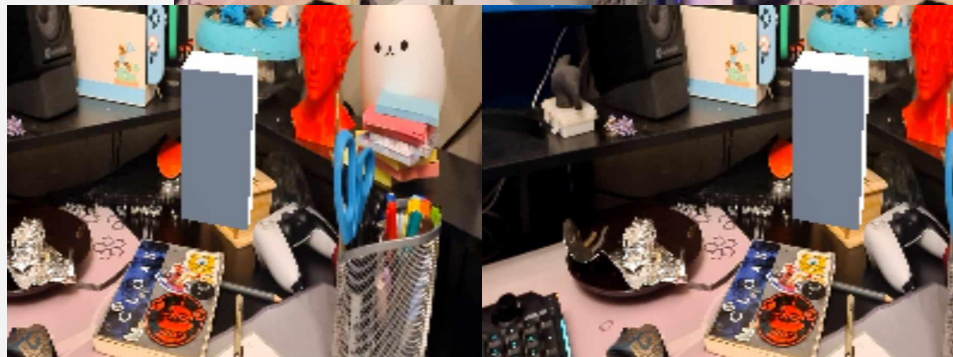
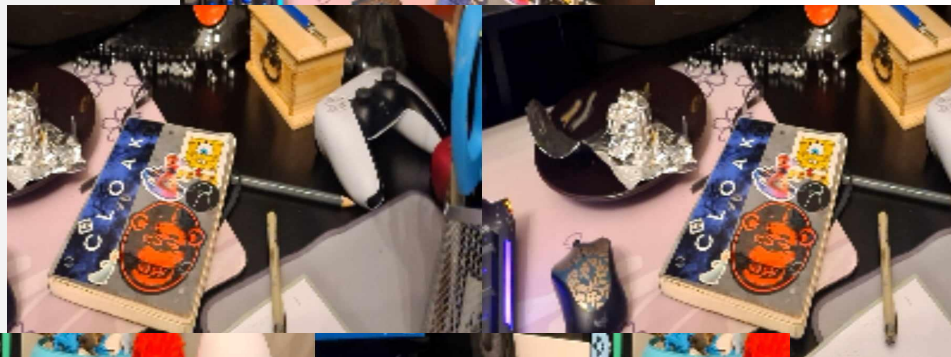
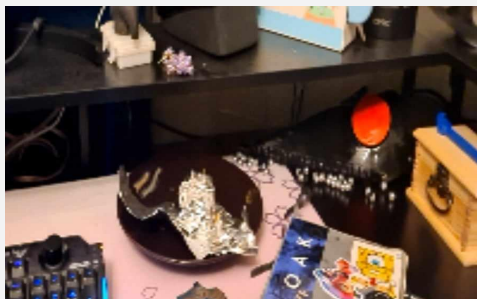
I found a tutorial that explained image recognition and replacement. They used a king of hearts and replaced it with a 2 spades, so I tried to mimic with dominos, it did not work. I thought it was not detailed enough so I used my unique book cover. While that didn't work at first I found the solution that had nothing to do with the detail of the photo I choose, but rather the scene it was exporting. I did not replace the book cover, but placed a 3d object that was off center but attached to the tracked image.







Please don't judge how messy my desk is



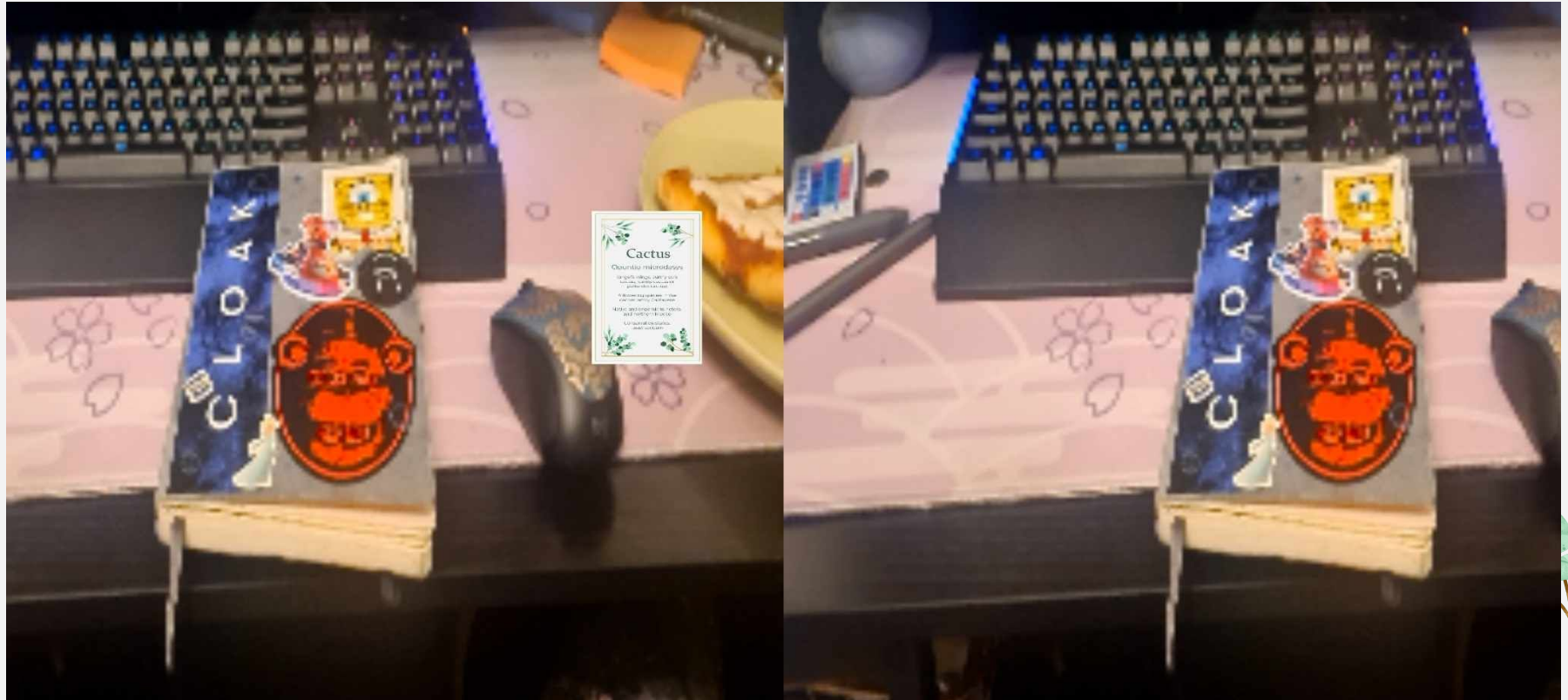
# Process

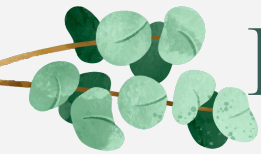
These are process images of how only 1 screen worked at first, or how when both worked it wouldn't scan the image. And the final image being fully scanned with 2 views. This is what I struggled with the most, but after talking with my co-worker he described a way to get the camera to export as a raw image, and with that we can create a canvas with each of those images covering the full display, therefor mimicking the AR view that I wanted. I still however have no idea why it is so blurry. I believe it has something to do with how the images might be stretched over the canvas, or because of the processing power it takes to display and run 2 cameras at the same time.





# Getting the screen size right





# Everything that I had to download

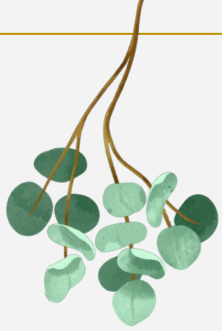
1. There was no lingerie “Cardboard XR Plugin” but there was a “Google ARCore XR plugin” which I added instead. Spoiler, it was not the right package I need.
  - What it was is that I was trying to use a VR camera in an AR setting
  - I still needed the cardboard pluggin I think and I was able to add it in package manager with this “<https://github.com/googlevr/cardboard-xr-plugin.git#release/1.19.0>” but it still didnt work
  - Still didn't work because while I had GitHub Desktop installed Git is a completely different application that I still needed (look to step 3)
2. I also added this Native Camera 1.3.7.
  - By going to package manager and adding this “<https://github.com/Unity-Technologies/NativeCamera.git>”
3. I had to Download Git and change its PATH (one of the scariest things I've done on my PC also the below step by step is from Chat GPT which is kinda why I love it)
  - Add Git to the System PATH (Windows):
  - Go to "System Properties > Advanced > Environment Variables" on your computer.
  - Under the "System variables" section, find the "Path" variable and click "Edit."
  - Click "New" and add the path to the directory where Git is installed (e.g., C:\Program Files\Git\bin and C:\Program Files\Git\cmd).
  - Click "OK" to close the dialogue.
4. Gradle Is something else I had to download
  - Under "System Variables," find and select the Path variable, then click "Edit."
  - Add a new entry that points to the bin directory of your Gradle installation. In your case, it should be something like C:\Gradle\gradle-8.4\bin.
  - Click "OK" to save the changes.



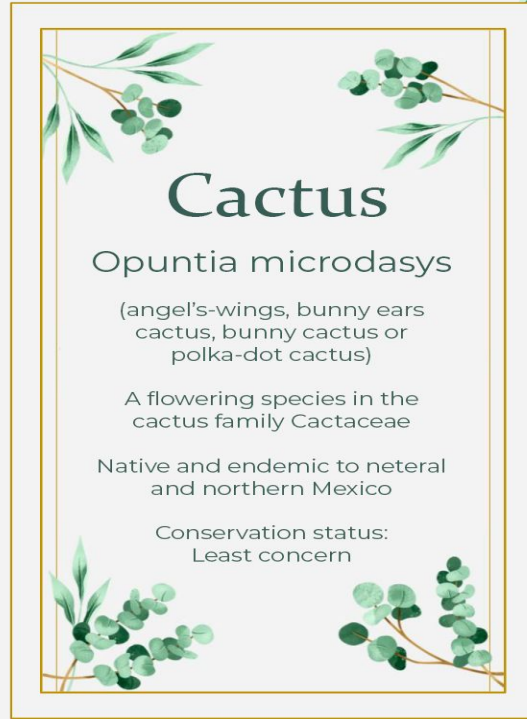
# Errors that came up

1. All the AR defaults, I had to change to XR since AR is no longer a standalone option
  - Android SDK Build-tools component is not found. Make sure all tools are installed in the SDK manager.  
UnityEditor.Modules.ModuleManager:InitializePlatformSupportModules ()
  - Saving has no effect. Your class 'UnityEditor.XR.Simulation.XREnvironmentViewManager' is missing the FilePathAttribute. Use this attribute to specify where to save your ScriptableSingleton. Only call Save() and use this attribute if you want your state to survive between sessions of Unity.  
UnityEditor.XR.Simulation.XREnvironmentViewManager:OnDisable ()  
(at./Library/PackageCache/com.unity.xr.foundation@5.1.0/Editor/Simulation/XREnvironmentViewManager.cs:169)
2. I was using the AR preset but I then had to download XV and VR packages and then redownload the AR package because I kept getting compiler errors before I even added anything to the scene
3. And of course all the previous things I had to download.

To be honest I am not sure if I am using all of the programmes that I have downloaded but now when I try to export it to my laptop, I have tons of compiler errors. I can no longer work on it on my laptop, only from my PC.

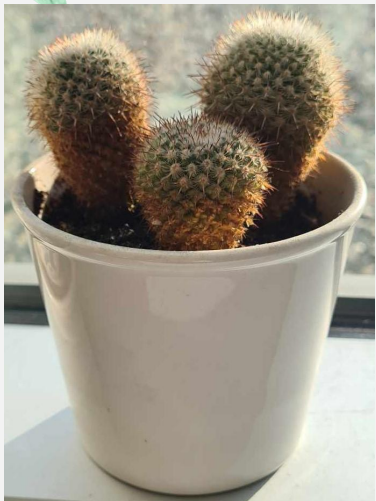


# The Info

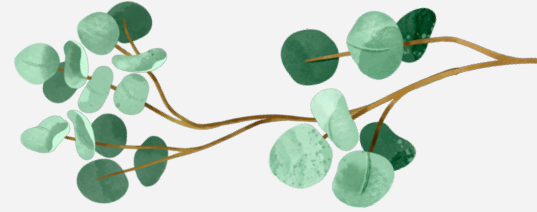


I just used one of the slides available from this presentation and exported it to Photoshop to add the texts. It is based on one of the cactus in the IXD lab. And the rest of the information I had gotten from Wikipedia using google lens.

# What it is SUPPOSED to scan



I think some of these photos did not work because while my notebook is a 2D flat image, these cactuses are fully 3D and Unity might be having a hard time scanning them.



# Resources/Conclusion

Thank you for listening

04

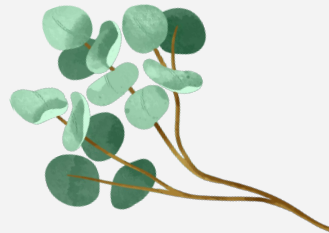




# The Final Product



This is what the final AR prototype looks like.





# Conclusion

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I think I spent too much time researching on the wrong topics. I certainly don't have the luxury of hindsight. However, I spent a considerable amount of time researching how to make QR codes, physical AR glasses, or even just what program to use, only to realize later that most of it wouldn't contribute to the project. I only found the tutorial about image tracking in Unity much later in the project. I had also explored several programs over multiple days, but I had gone back to using Unity which was my first choice.

I am still very happy with the overall product, and I am grateful that I looked into all of these programs because I learned a lot. However, I recognize that I could have developed my project faster as well as spent more time researching aspects I couldn't accomplish. For instance, not relying on image tracking/recognition but instead teaching software to recognize a tree, or finding a way to connect Google to my project and utilize Google Lens.





# Resources

- <https://www.youtube.com/watch?v=CwgOI1JAyeY>
- [https://github.com/tensorflow/models/blob/master/research/object\\_detection/g3doc/tf2\\_detection\\_zoo.md](https://github.com/tensorflow/models/blob/master/research/object_detection/g3doc/tf2_detection_zoo.md)
- <https://youtu.be/BWO-7XgYi0Q?si=MrESUFvD1aQT--uS>
- [https://youtu.be/DKyAAHY\\_oJ4?si=ZQZteOETKPAFKQb9](https://youtu.be/DKyAAHY_oJ4?si=ZQZteOETKPAFKQb9)
- [https://youtu.be/0\\_u-9nykBrq?si=4PrN4bPtfm4q1gKd](https://youtu.be/0_u-9nykBrq?si=4PrN4bPtfm4q1gKd)
- <https://youtu.be/xKvffLRSyPk?si=yfQK0dzPOSkUc8zk>
- <https://youtu.be/N2ioyWYt0AM?si=pKUGgk0YmeGGfFb2>
- <https://youtube.com/shorts/RmprTQ9PT7Y?si=mnLuyWQr3oHCICmP>
- <https://youtu.be/lpJqzwxWg-k?si=9UkekpCQumKJUK6P>
- <https://youtu.be/4ZY760EIUc4?si=IOL83uEZNavB3gSj>
- [https://youtu.be/pkB1Nahi-X0?si=kw\\_BDqcsFgrfxPOq](https://youtu.be/pkB1Nahi-X0?si=kw_BDqcsFgrfxPOq)
- <https://www.merriam-webster.com/dictionary/augmented%20reality>



# Chat GPT initial prompts (heard I have to submit it this way as a source?)

- hey what are some micro interactions and micro agressions that could occur if AR glasses were commonplace and could be used to scan plants and animals to identify their species
- using raw image render and canvas, i was able too display 2 AR cameras at the same time, however when I export to my phone it only shows 1, how do I fix this
- hey new question. if i hand 2 AR cameras in my unity project, and wanted to display both at the same time, how could I?
- hey im trying to make a mr scene in unity. i keep getting this message "CommandInvokationFailure: Gradle build failed.
- C:\Program Files\Unity\Hub\Editor\2022.3.13f1\Editor\Data\PlaybackEngines\AndroidPlayer\OpenJDK\bin\java.exe -classpath "C:\Program Files\Unity\Hub\Editor\2022.3.13f1\Editor\Data\PlaybackEngines\AndroidPlayer\Tools\gradle\lib\gradle-launcher-7.2.jar" org.gradle.launcher.GradleMain "-Dorg.gradle.jvmargs=-Xmx4096m" "assembleRelease".....
- ok i need to Next Packages must be manually installed with Git & Unity Package Manager:
- Native Camera 1.3.7.
- Google Cardboard XR Plugin for Unity 1.19.0.
- Edit > Project Settings > XR Plug-in Management > Select Cardboard XR Plugin under Plug-in Providers for both: iOS & Android.
- Hey! I want to be able to create AR glasses in unity with a google carboard
- ok please. I really need your help. i have followed this tutorial on youtube that allows Unity to recognize an image and place a prefab cube once it recognizes the object. the problem however is that it displays like an normal AR app on my phone, but I want it to I want the screen on my phone to be set up in a VR view (stereoscopic view). so my display split into 2 with one slightly offset. As if it was in VR. BUT I still need it to be able to scan my image.
- what could the pros and cons be of having an ar lens that identifies the species of plants and wildlife you are looking at
- i have a unity AR project. however, is there a way so that when it opens on my phone it opens in the VR format. (so sideways with 2 screens for each eye so i can hold my phone up to my head. it does still need to be able to use the camera
- hey. if i wanted unity to recognize a tree in AR. like recognize a species of tree without having a picture of the exact tree... is it even possible?
- hey im trying to follow this tutorial online... is this code still up to date/accurate? "// See <https://youtu.be/gpaq5bAja8> for accompanying tutorial and usage!
- oki finally have what i think is a working setup of an AR scene in Unity, but when i export to my phone that is in developer mode with a usb connection. it is just a black screen
- how come as soon as i open unity with the AR preset it gives me errors and asks me to enter safe mode
- hey unity keeps giving me this error message "Collab] Collab service is deprecated and has been replaced with PlasticSCM"



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