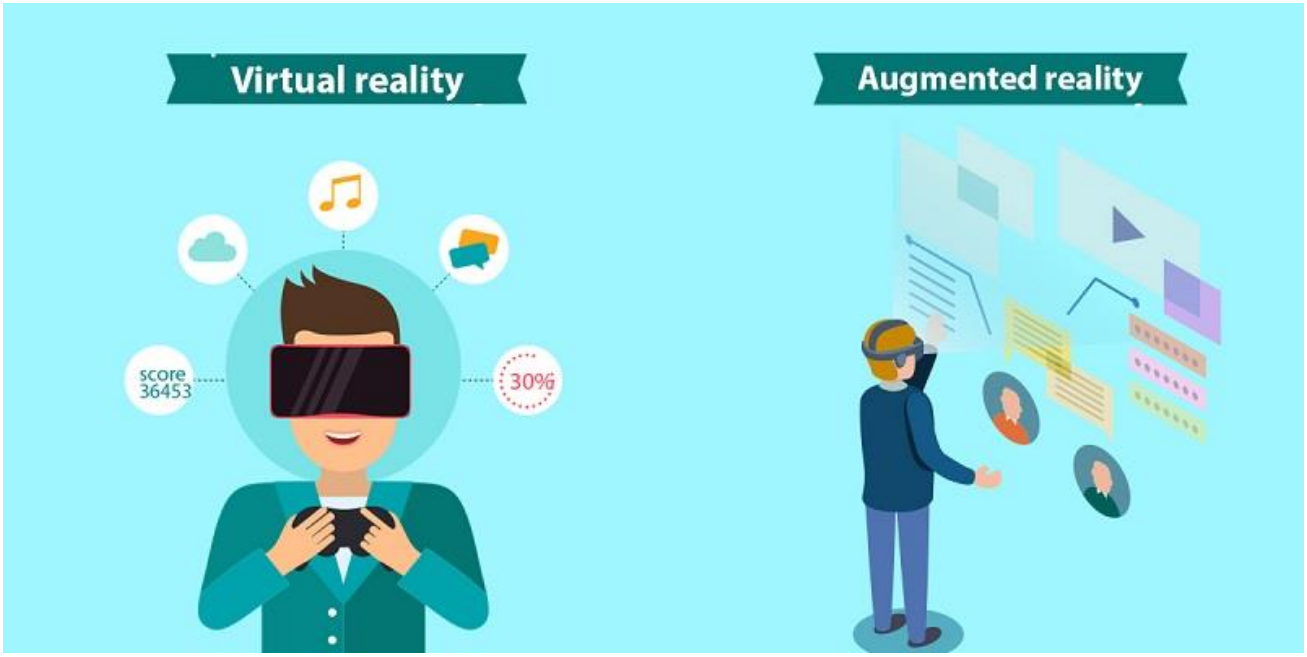
Augmented reality (AR) and Virtual Reality (VR) Projects and Applications

Augmented Reality (AR) vs. Virtual Reality (VR): What's the Difference?

AR and VR Are Not the Same

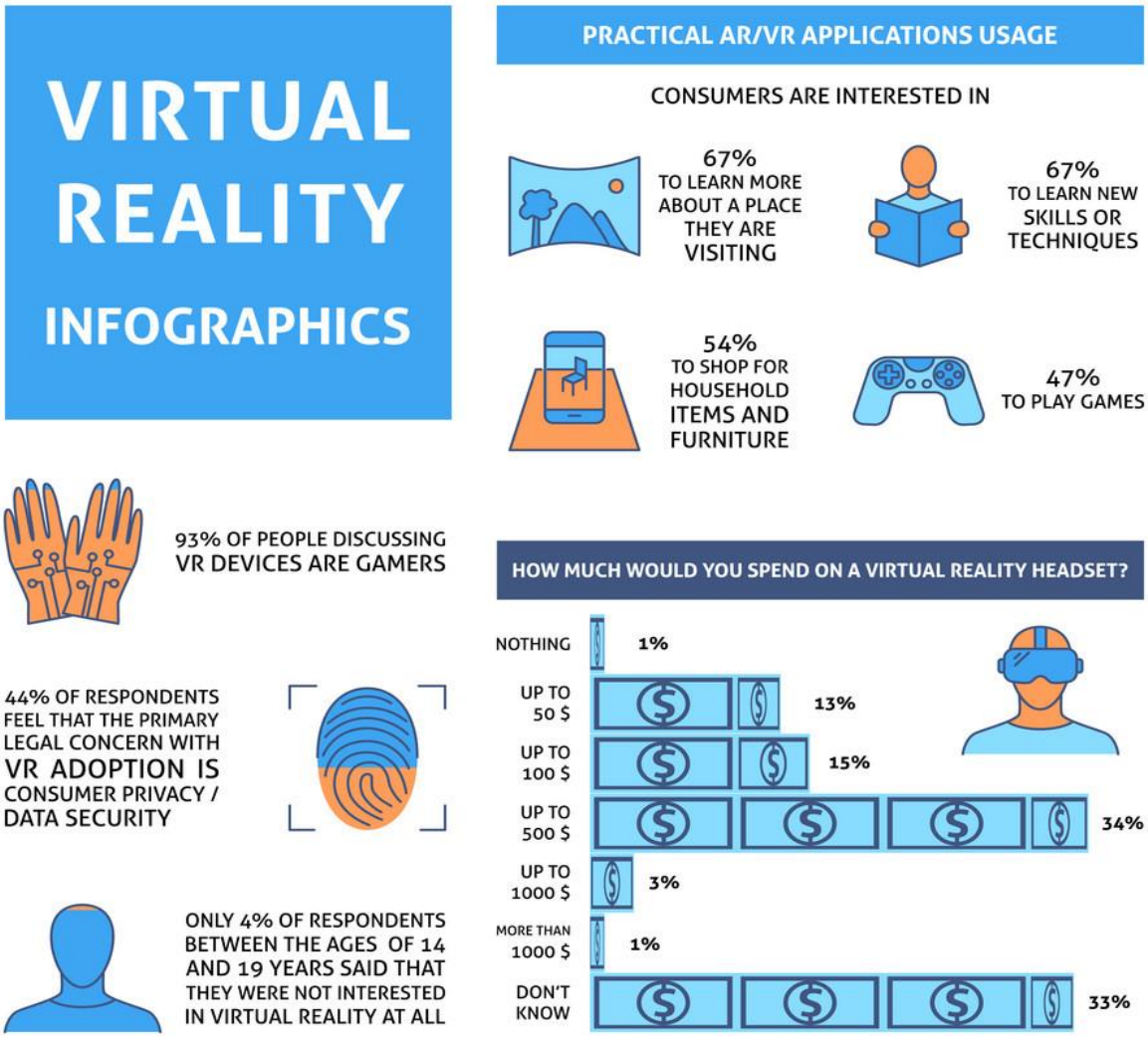
The terms "virtual reality" and "augmented reality" get thrown around a lot these days, thanks to the resurgence of VR headsets heralded by the Oculus Rift and the use of AR apps and games like Pokémon Go. They sound similar, and as the technologies develop, they bleed over into each other a bit. They're two very different concepts, though, with characteristics that readily distinguish them from one another.



What Is Virtual Reality (VR)?

VR headsets completely take over your vision to give you the impression that you're somewhere else. The HTC Vive, the Oculus Rift, and other headsets are completely opaque, blocking out your surroundings when you wear them. If you put them on when they're turned off, you might think you're blindfolded.

When the headsets turn on, however, the LCD or OLED panels inside are refracted by the lenses to completely fill your field of vision with whatever is being displayed. It can be a game, a 360-degree video, or just the virtual space of the platforms' interfaces. Visually, you're taken to wherever the headset wants you to go—the outside world is replaced with a virtual one.



What Is Augmented Reality (AR)?

Whereas virtual reality replaces your vision, augmented reality adds to it. AR devices like the Microsoft HoloLens and various enterprise-level "smart glasses" are transparent, letting you see everything in front of you as if you are wearing a weak pair of sunglasses. The technology is designed for completely free movement while projecting images over whatever you look at. The concept extends to smartphones with AR apps and games like Pokémon Go, which use your phone's camera to track your surroundings and overlay additional information on top of it, on the screen.

1. BARBARIAN MODEL

Projecting Barbarian 3D Model on Image Target

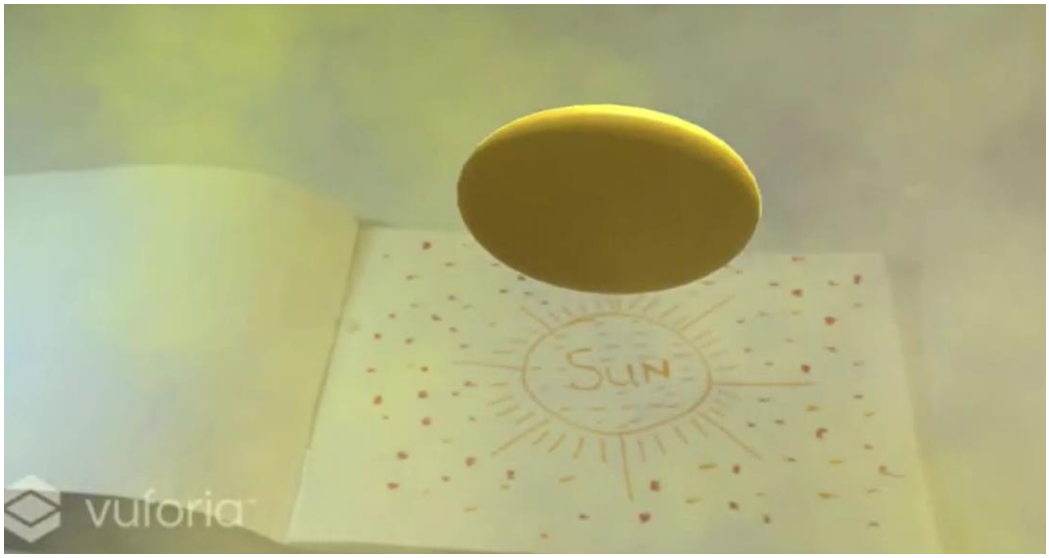
- How to position, rotate and scale game objects in unity
- Adding rigid body and saving the scene
- Adding Material Colour's to Game Objects
- Adding Background Images (Textures) to Game Objects
- Rotating the Sphere
- Adding shadow to Barbarian Model

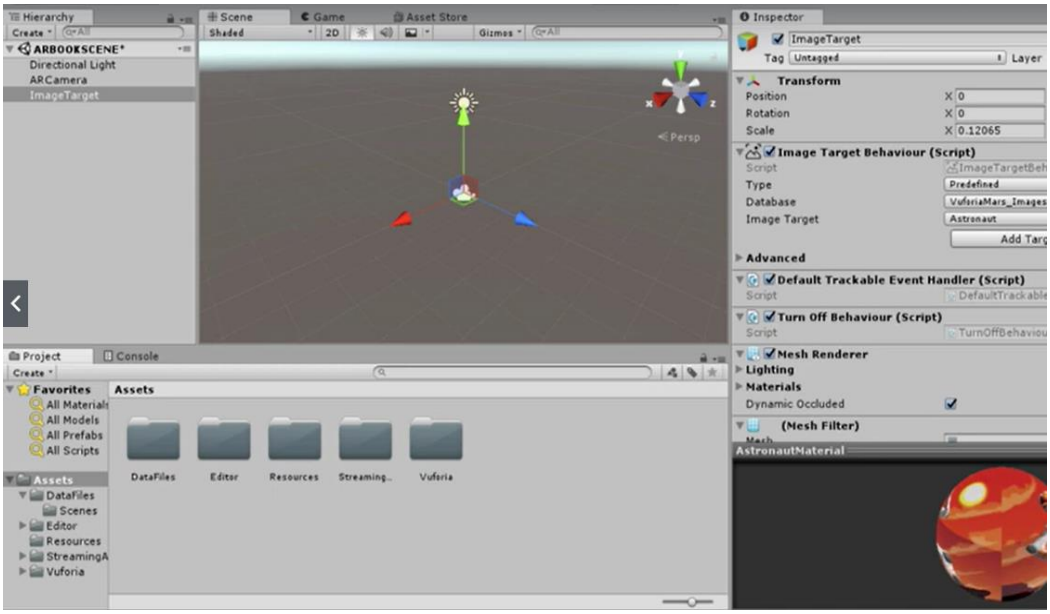
Superimposition-based augmented reality uses object recognition. The augmented image replaces the original image either partially or fully. This type of AR is commonly used in the medical field to superimpose an X-ray onto a patient's body. It can also be used to enhance a historical tour.

2. AUGMENTED REALITY BOOK APPLICATION

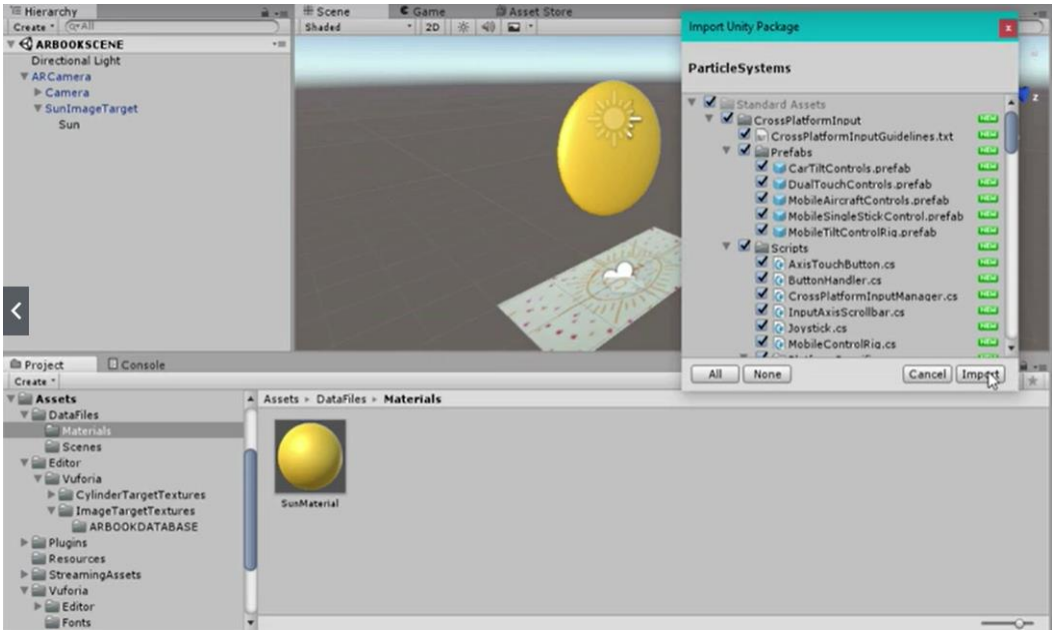
- Customizing Sun Image Target
- Customizing the HOUSE Image Target
- Customizing the SHIP Image Target
- Customizing the CAR Image Target
- Customizing the FOREST Image Target
- Customizing the AEROPLANE Image Target
- Adding Cloud models
- Customizing the ARBOOK Cover Image Target
- Adding 3D Text on top of Image Target
- Building the APK file of ARBOOK App
- Output of AR Book Application
- Problem related to Ship & Aeroplane
- Default Trackable Event Handler Script Update
- Solution for Ship & Aeroplane Image
- ARBOOK FINAL OUTPUT
- Reset the SHIP to its original position
- Reset the Aeroplane and Cloud Game object

Customizing Sun Image Target





Projector-based augmented reality uses advanced projection technology to simplify the complex manual tasks that are part of a company's manufacturing, assembly, sequencing and training operations.



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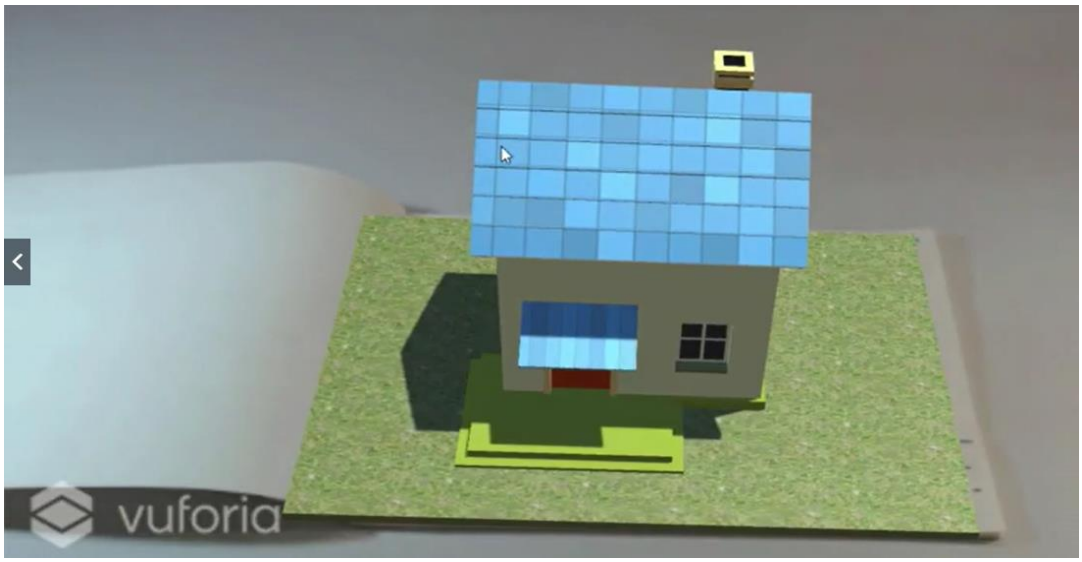
Customizing the HOUSE Image Target



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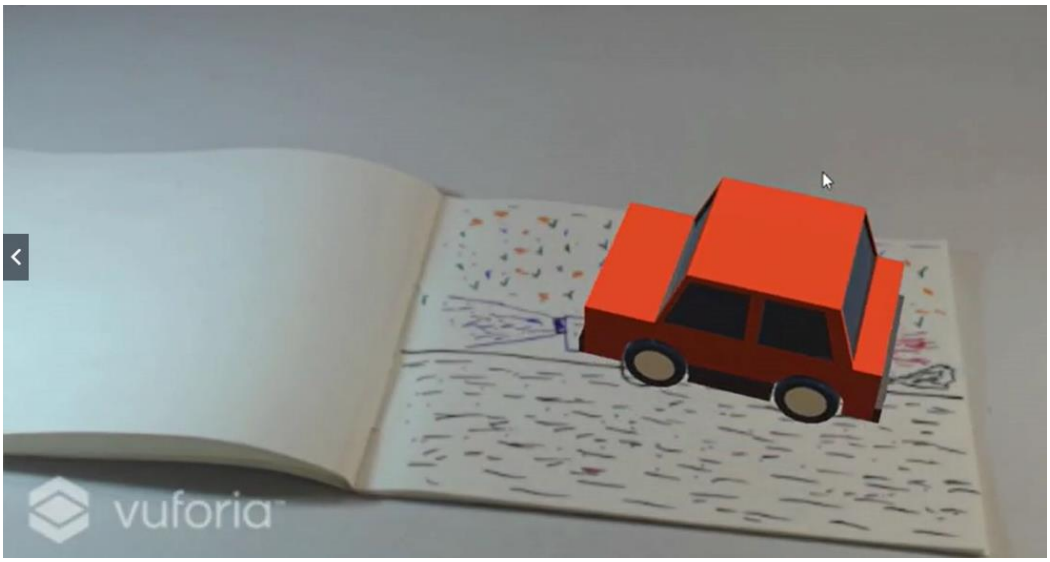
Customizing the SHIP Image Target

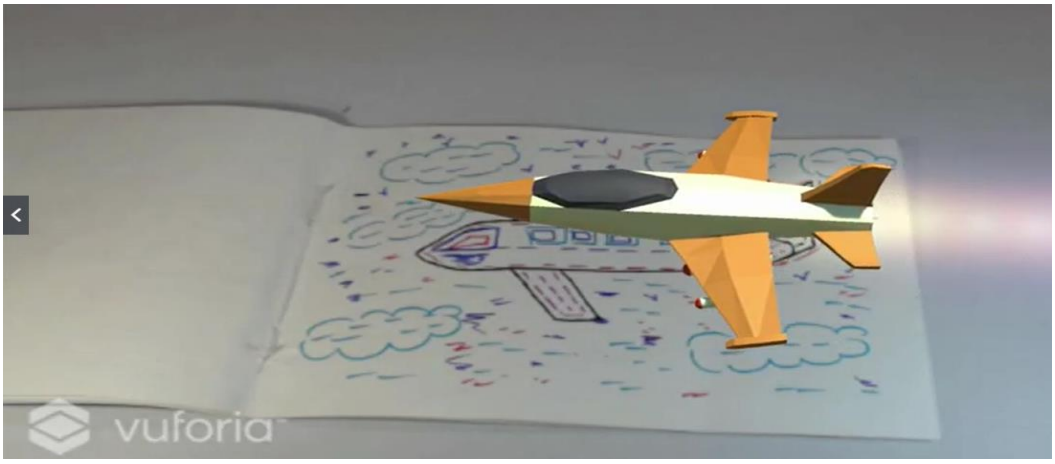
Customizing the CAR Image Target

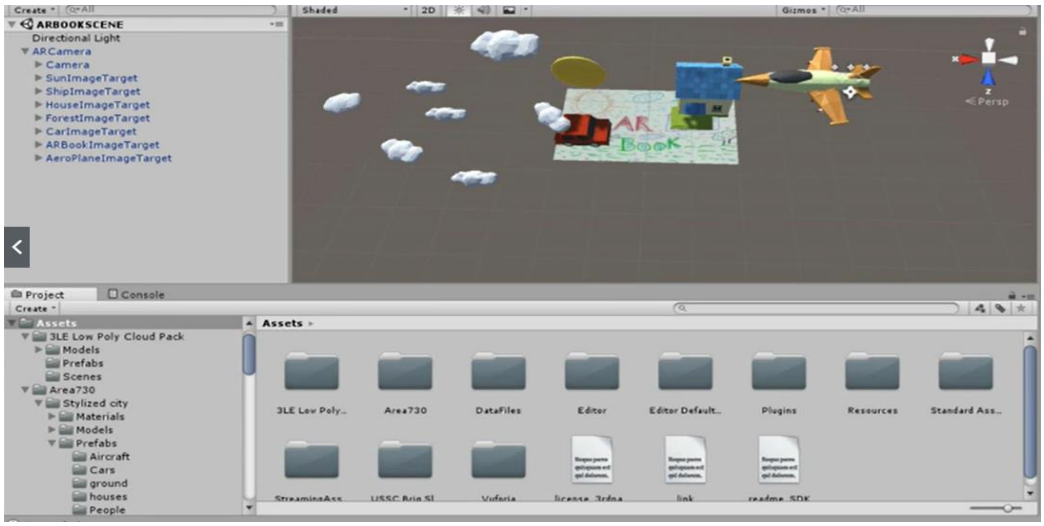
For both games and apps, virtual reality completely supersedes your surroundings, taking you to other places. Where you are physically doesn't matter. In games, you might sit in the cockpit of a star fighter. In apps, you might virtually tour distant locations as if you were there. There are tons of possibilities in virtual reality, and they all involve replacing everything around you with something else.

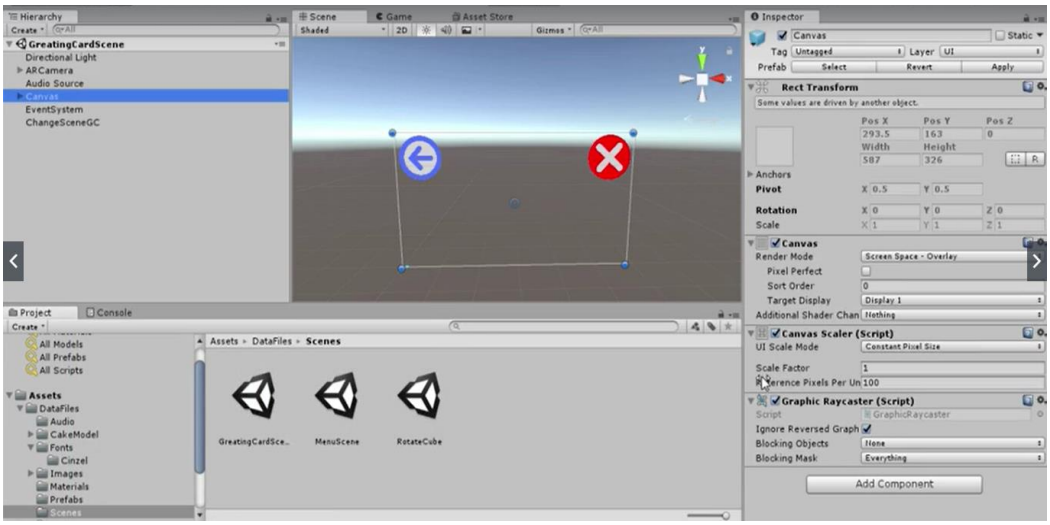


Customizing the FOREST Image Target

Customizing the AEROPLANE Image Target



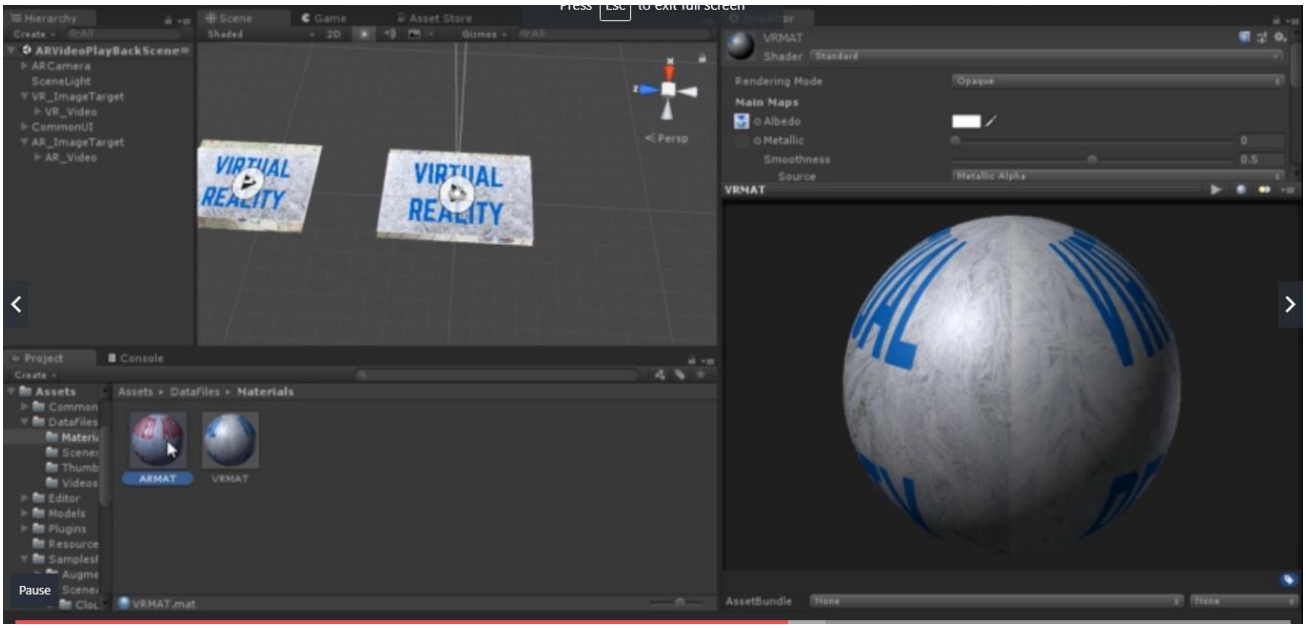




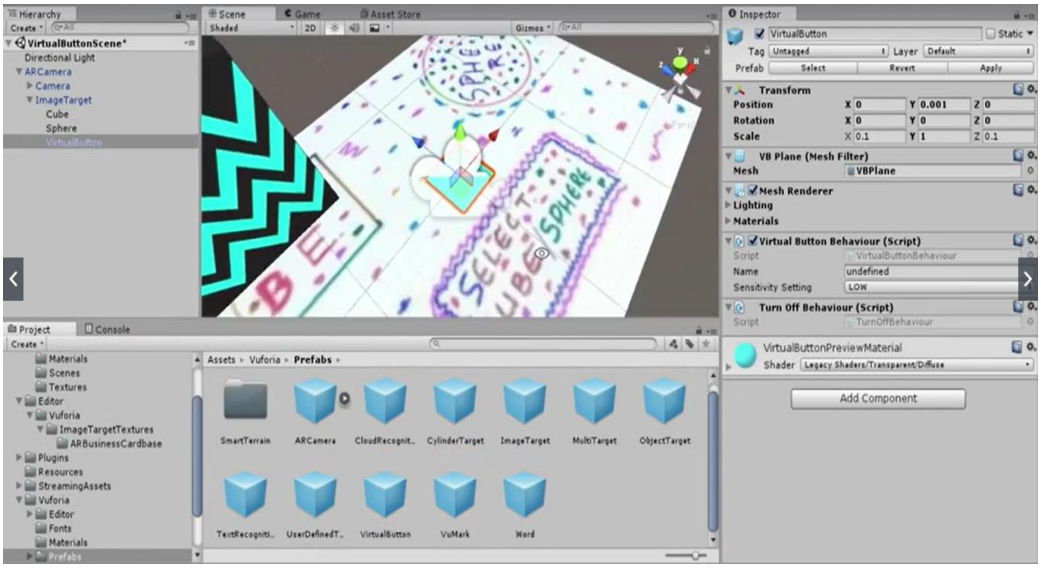
3. AUGMENTED REALITY GREETING CARD

- Rotating the Cube
- Switching between Scenes on Button Click
- Designing the Back and Close Image Button
- Script for Back and Close Image Button
- Building the AR Greeting Card app (with Background Image)
- Building the AR Greeting Card app (with Smartphone Camera Output)
- Virtual Button & AR Business Card
- Adding Virtual Button & Game Object's on top of Image Target
- Script to check whether the Virtual
- Button is Pressed or Released
- Building the apk file for AR Virtual Button app
- Adding multiple Virtual Button's on Image Target
- Playing video files on top of Plane
- Deactivating the Plane Game Object's
- Changes in AR BCard Script

While VR completely covers and replaces your field of vision, AR apps only show up on your smartphone or tablet screen, and even the HoloLens can only project images in a limited area in front of your eyes. It isn't very immersive when a hologram disappears once it moves out of a rectangle in the middle of your vision, or when you need to stare at a small screen while pretending that the object on that screen is actually in front of you.



4. BUILDING THE APK FILES FOR BUSINESS CARDS



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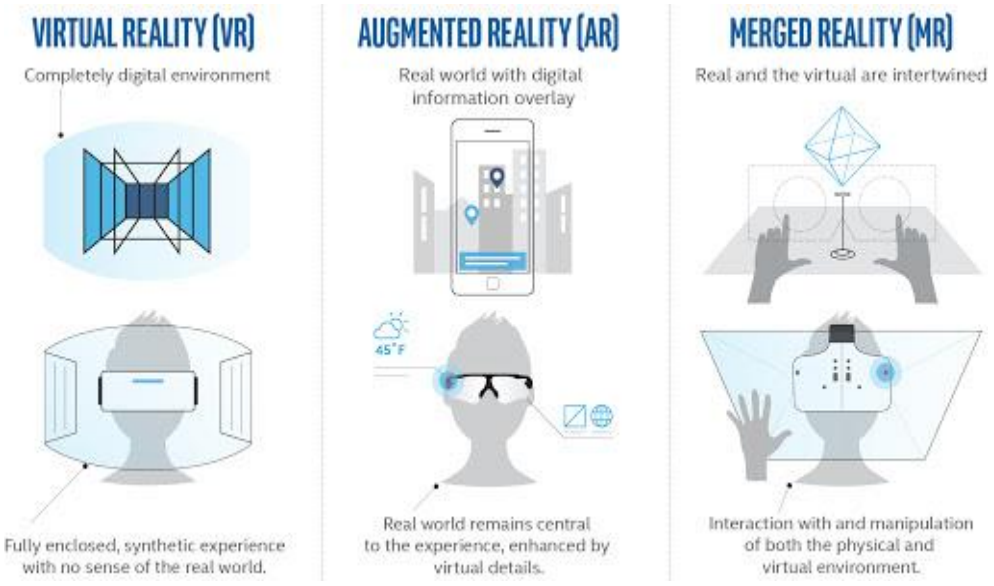
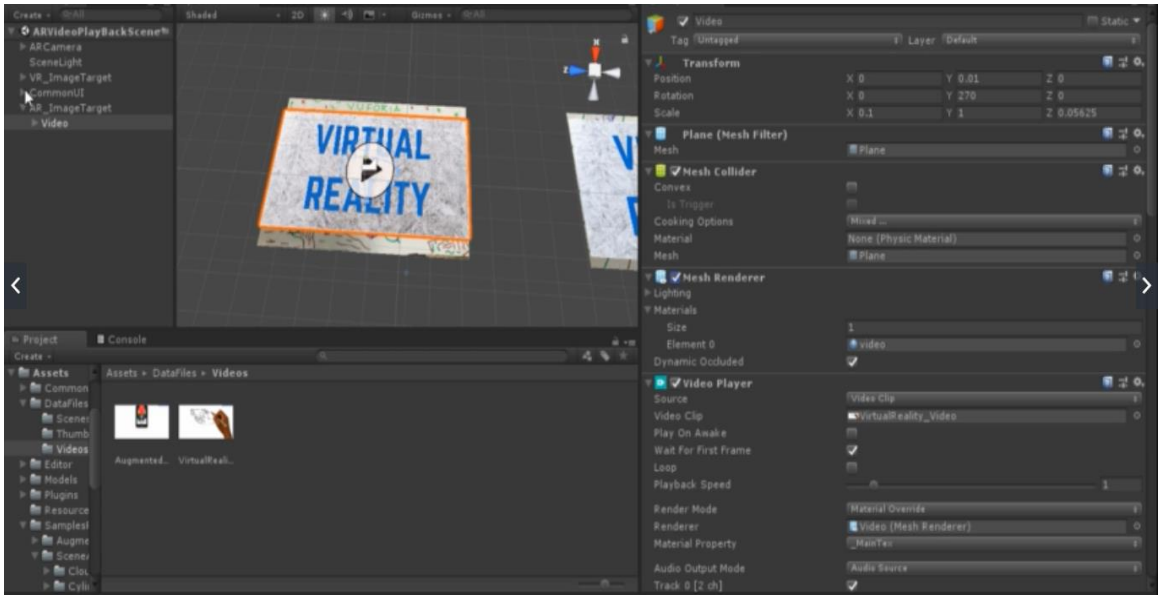
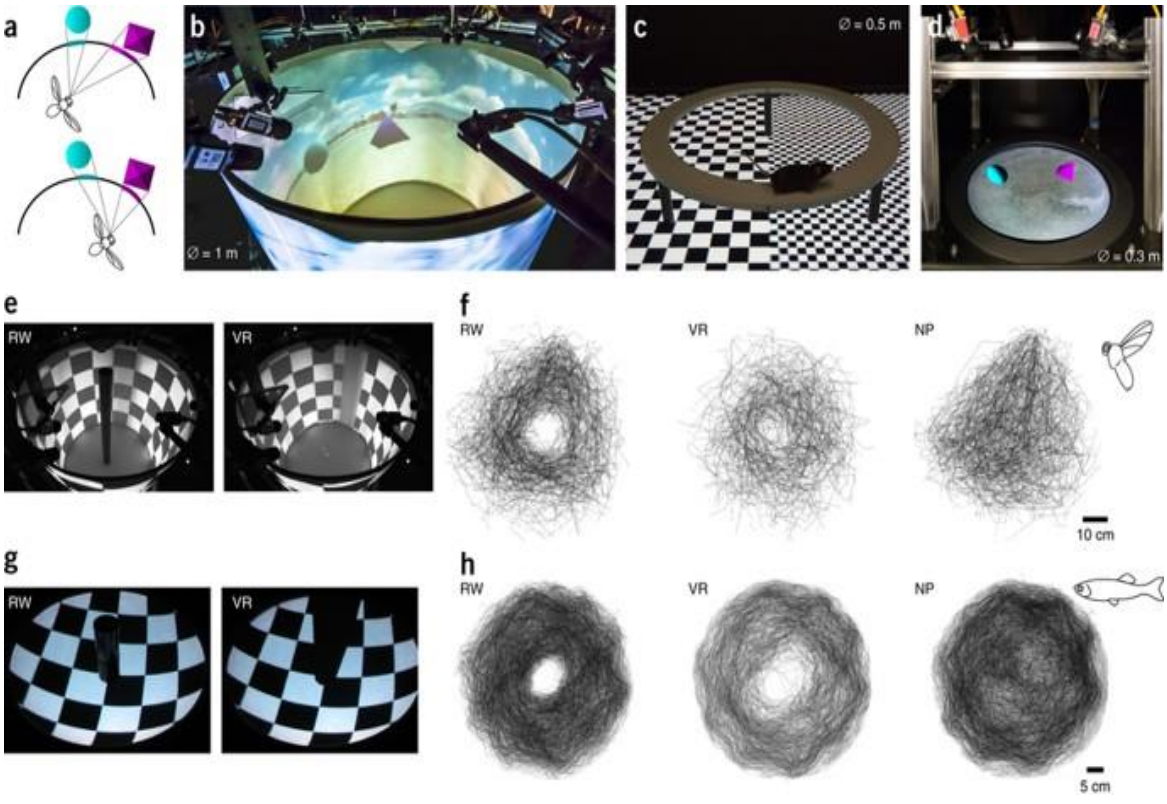


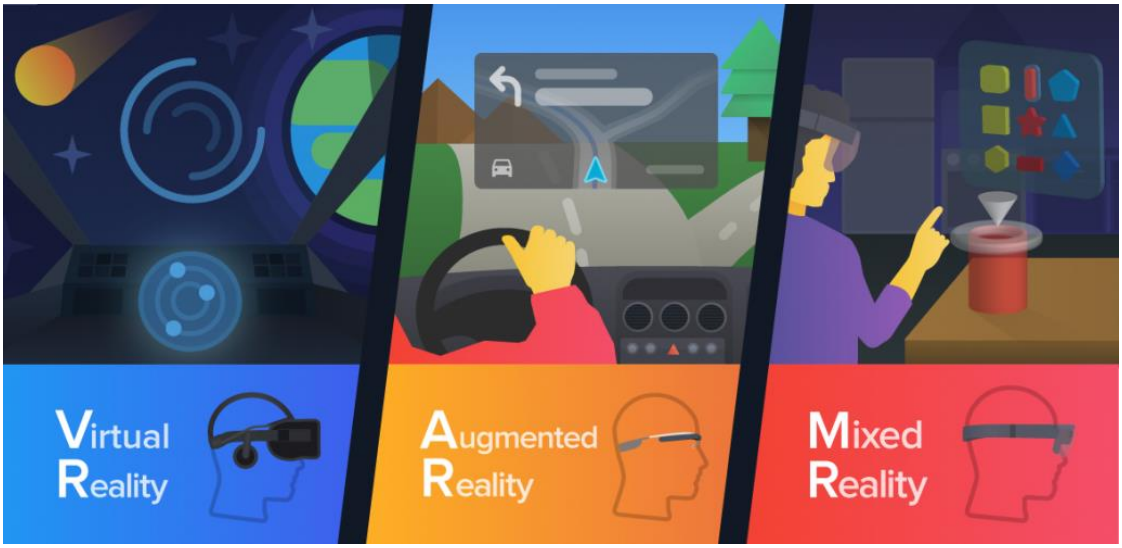
5. Projecting Plane 3D Models surrounding the Cylinder Target



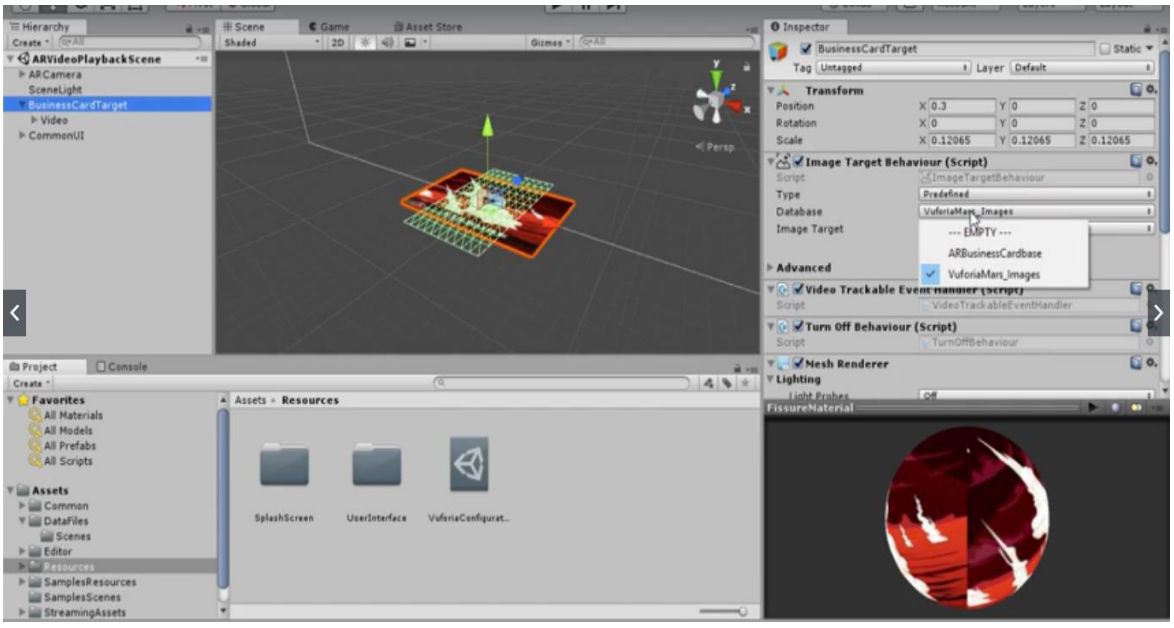
- Projecting Cloud 3D Models
- Adding Earth & Terrain Models
- Animating the Game Objects
- Building the AR Cylindrical Target Project



6. AR VIDEO PLAYBACK APPLICATION

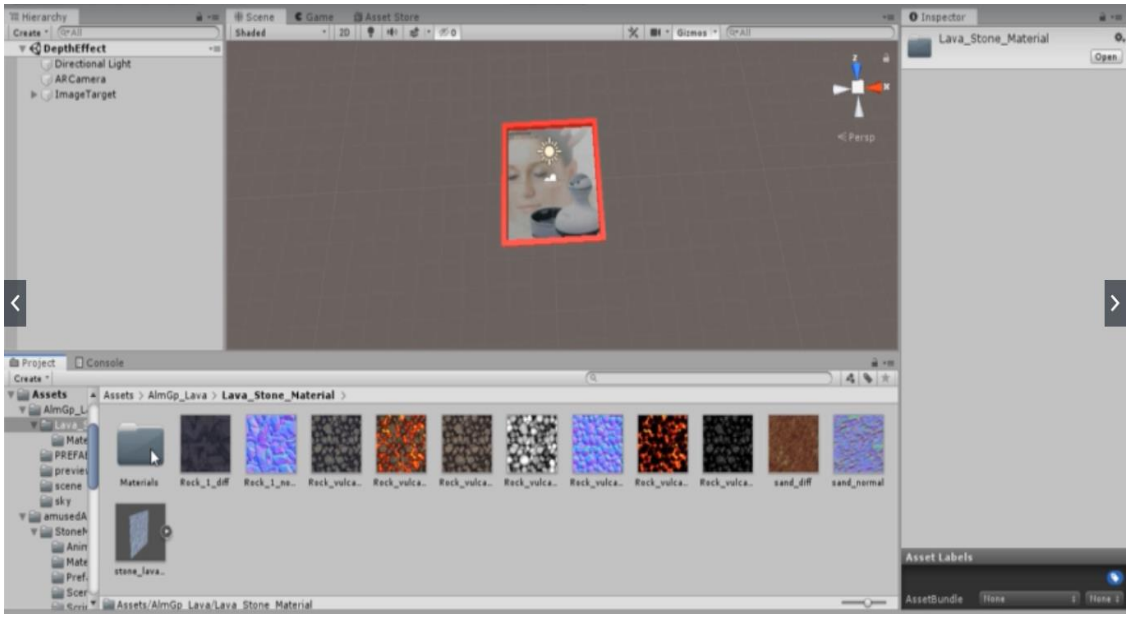


- Vuforia Video Playback App Intro
- Update: Importing Vuforia in Unity
- Importing Vuforia Core Samples
- AR Camera's Far Clip plane Bug
- Customizing Thumbnail and Video
- Playing Two Video's
- Changing the Video's shade
- Deleting the Common UI component & building the app

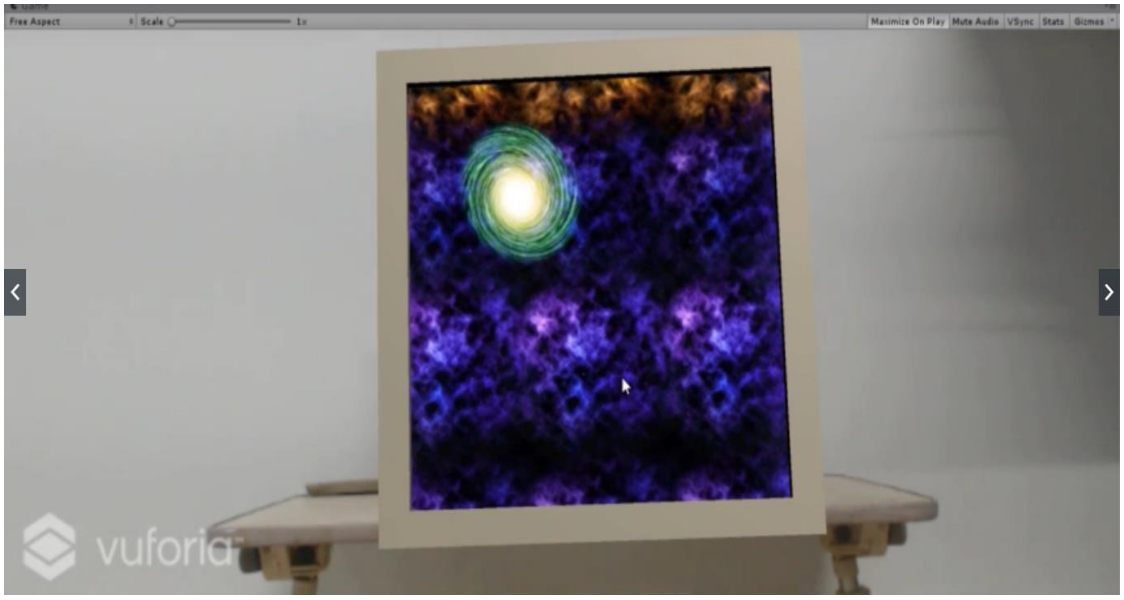


7. WINDOW PORTAL USING DEPTH MASK SHADER

- Update: Importing Vuforia in Unity
- Seeing through the Box using depth mask material
- Creating a square hole on top of the box
- Adding fire monster and flames
- Editing the Depth Mask Shader
- Adding Nebula and Galaxies to the window portal



8. CREATING A MINI SOLAR SYSTEM



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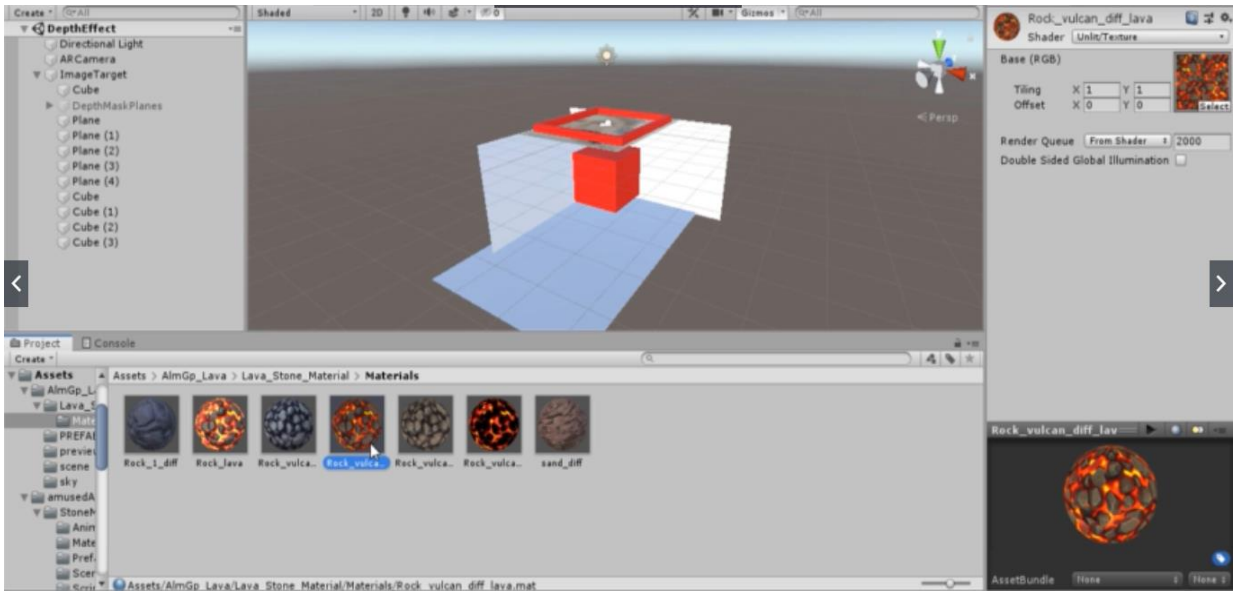

FUTURE OF AR & VR

Virtual reality and augmented reality accomplish two very different things in two very different ways, despite the similar designs of the devices themselves. VR replaces reality, taking you somewhere else. AR adds to reality, projecting information on top of what you're already seeing. They're both powerful technologies that have yet to make their mark, but show a lot of promise. They can completely change how we use computers in the future, but whether one or both will succeed is anyone's guess right now.

THANK YOU

AISHWARYA MISHRA

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