VR AND UNITY

Corso Realtà Virtuale 2024/2025

susanna.brambilla@unimi.it

WITH UNITY V2022.3.5

META XR SDK

META XR

Individual SDK packages (download from Oculus - Asset Store (unity.com)):

- **<u>Meta XR All-in-One SDK</u>**: bundles several SDKs
- **<u>Meta XR Core SDK:</u>** contains many essential functionalities which Meta XR headsets provide, including the camera rig, controllers, hand tracking, composition layer, …
- **<u>Meta XR Simulator:</u>** is built for developers that enables the simulation of Meta Quest headsets
- **<u>Interaction SDK:</u>** adds interactions like ray, poke, locomotion, grab for controllers, hands, and controllers as hands
- …

Import Meta XR SDKs in Unity Package Manager | Oculus Developers

IMPORT META XR

1. Open the Unity Hub and create a new Unity project
2. Download the Meta XR All-in-One SDK from [Oculus - Asset Store (unity.com)](unity.com)
3. Open it in Unity and click on Install in the Package Manager
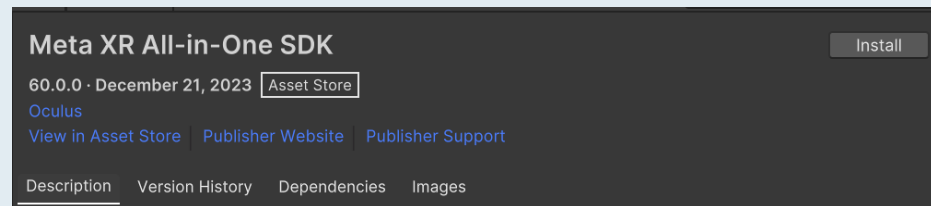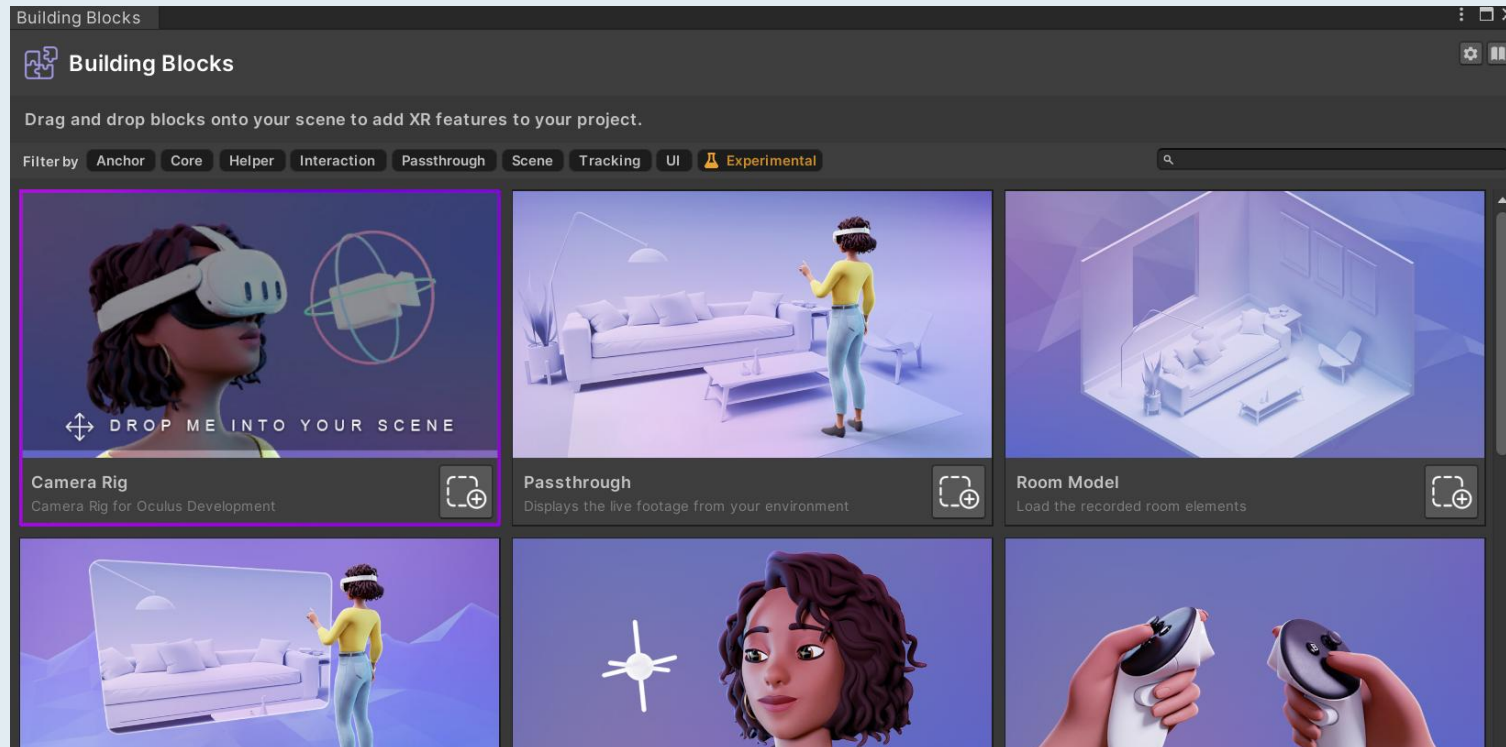

4. If requested, restart Unity
5. Click on the Oculus logo on the bottom right > Project Setup Tool > Fix All and Apply All

BUILDING BLOCKS

By clicking on the Oculus logo > Building Blocks, you can see the building blocks window

You can add a block with drag and drop in the Hierarchy
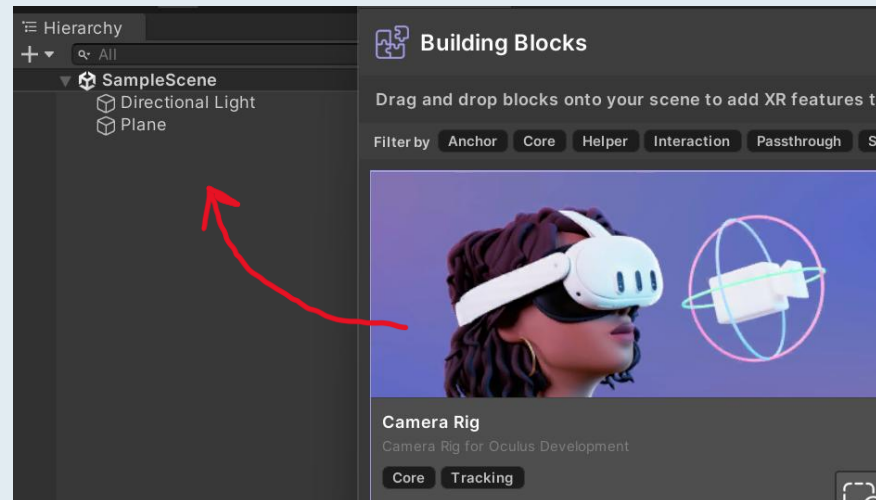
XR CAMERA

Right click on the Hierarchy panel to create a 3D Object > Plane, which will be our floor

Delete the Camera GO

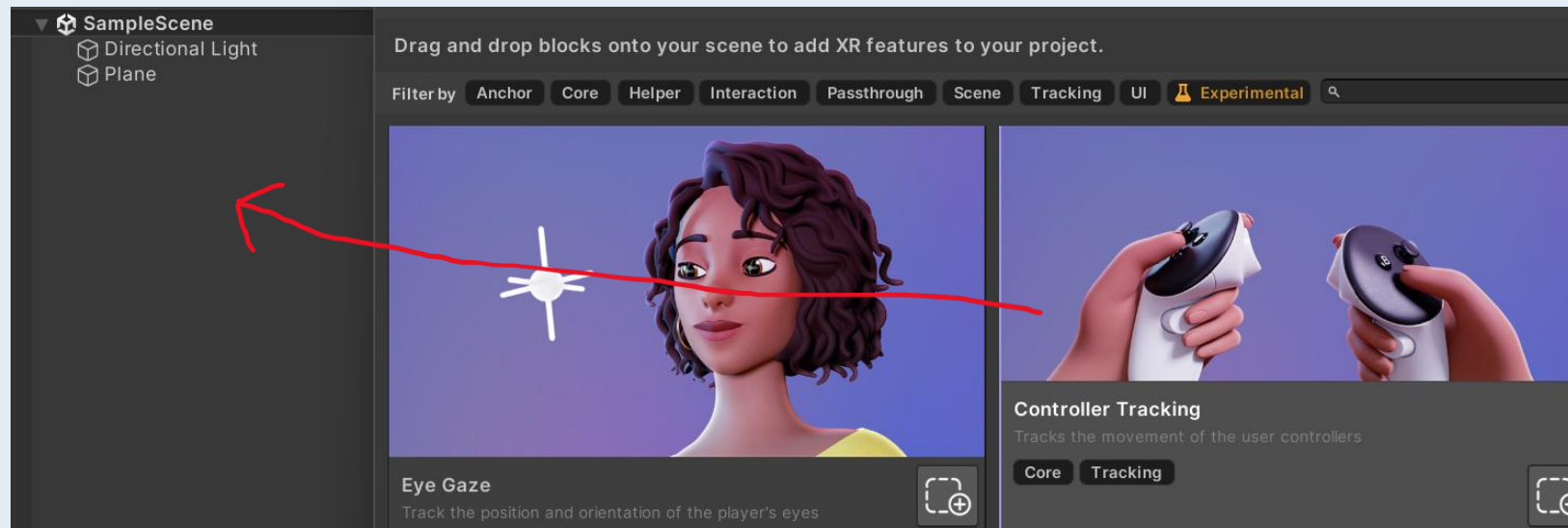1. Open the Building Blocks window and drag and drop the Camera Rig block in the Hierarchy

2. Now you have the reference of your head in the scene!

XR CONTROLLERS

.

1. Open the Building Blocks window and drag and drop the Controller Tracking block in the Hierarchy
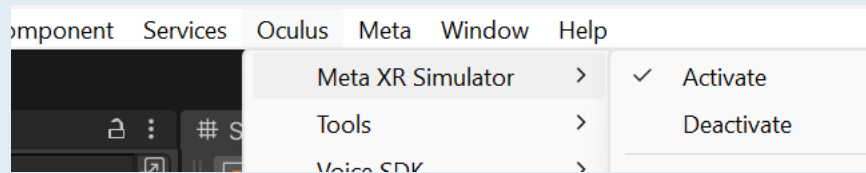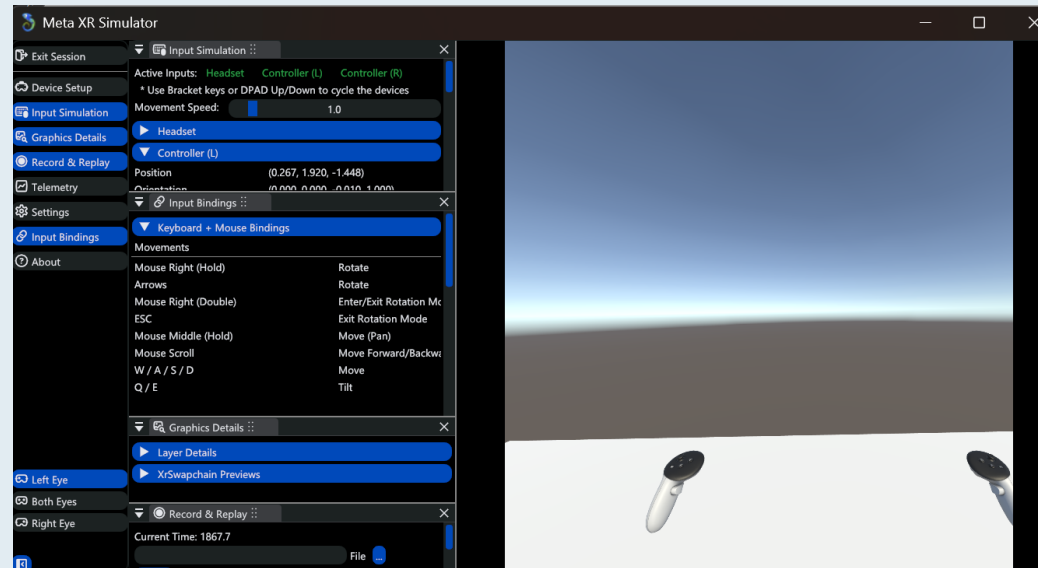

2. Now you have a reference of your hands in the scene!

XR SIMULATOR

1. Select Oculus in the top panel > Meta XR Simulator > Activate

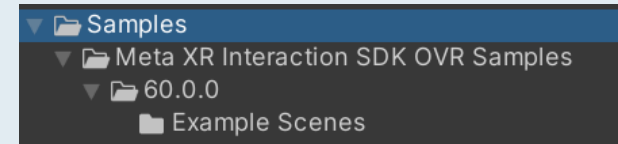2. Press Play

LOCOMOTION AND TELEPORTING

SET UP 1/2

But with the headset on... you can't move. You need:

1. Download the Interaction OVR Samples from the Asset Store:

[Meta XR Interaction SDK OVR Samples | Integration | Unity Asset Store](#)

2. In Assets, open the LocomotionExamples scene in:

3. You will find the Locomotion-related GOs under InteractionRigOVR-Synthetic > OVRInteraction > Controllers > Left/RightController > ControllerInteractors > **LocomotionControllerInteractorGroup** (left/right hands):
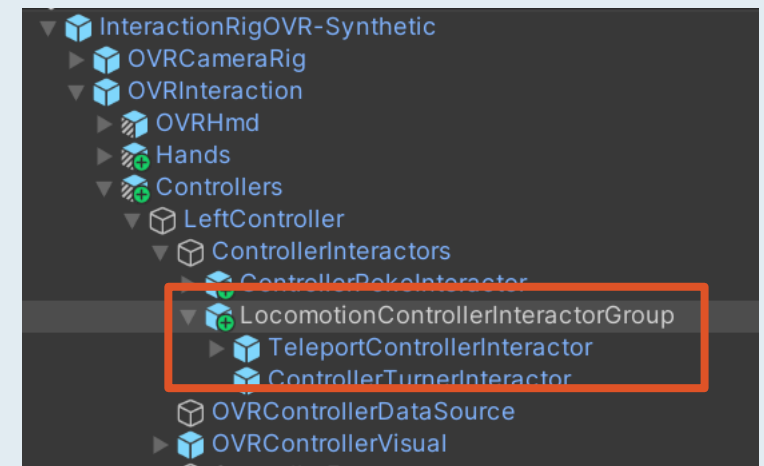
SNAP/SMOOTH TURN

In order to control the type of turn interactor:

1. Select ControllerTurnerInteractor under the ControllerInteractors GO
2. Change Turn Method in:
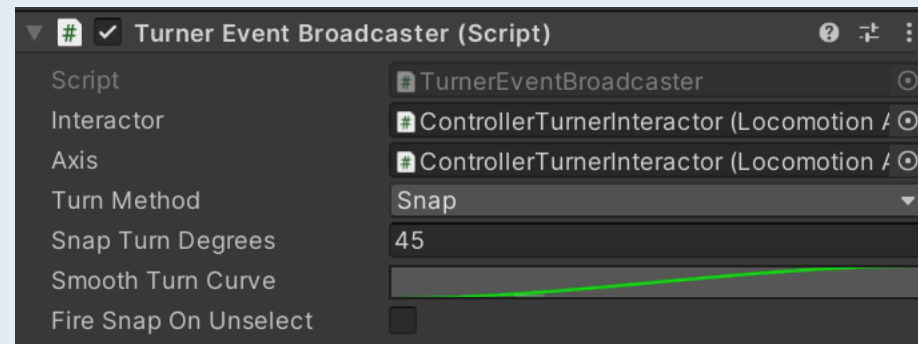
- Snap for discrete turn
- Smooth for continuous turn

TELEPORT/CONTINUOUS MOVEMENT

You can have a teleport or continuous movement:

- Use the TeleportControllerInteractor prefab for teleport

- Remove the Teleport ControllerInteractor prefab in LocomotionControllerInteractionGroup and the references in ControllerInteractors for Continuous Movement
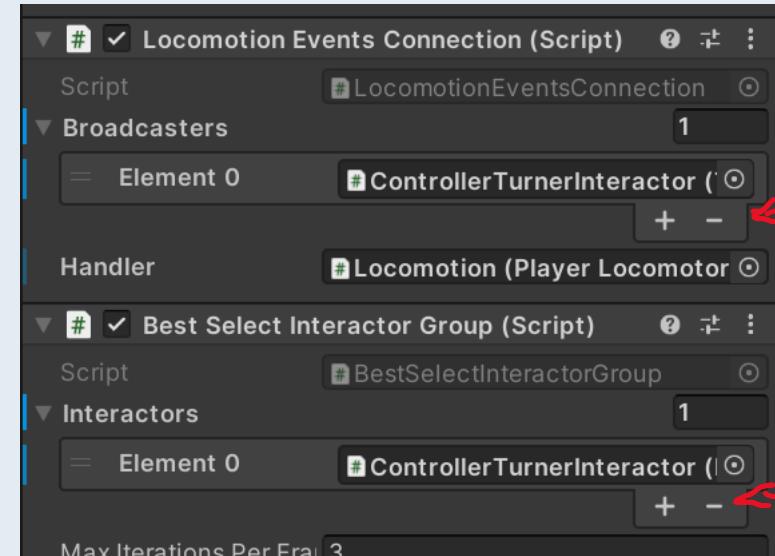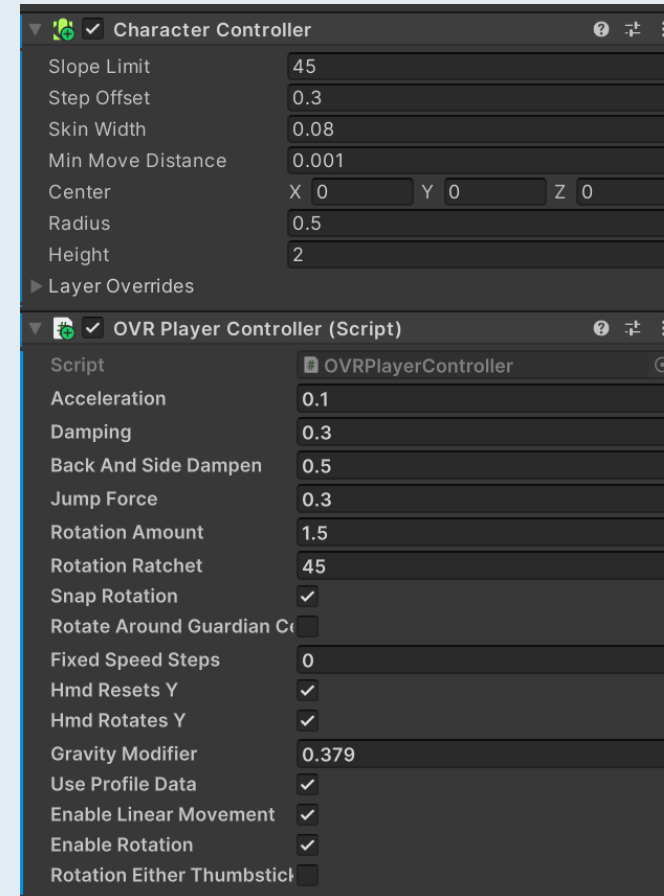
PHYSICS VR PLAYER

In order to have a physics VR player controller, we need to add to our player object:

- A Character Controller component, which will define the player's collider

- An OVR Player Controller script

Add a Collider to the floor

INTERACTIONS WITH OBJECTS

INTERACTOR

You can interact with objects in different ways:

- With a ray, to interact with an object by casting a ray, use the RayInteractorPrefab

- Poke, to interact with an object by touching it use the PokeInteractorPrefab

- Grab, to interact with an object by grabbing it use the GrabInteractorPrefab

- …

An interactor is a component attached to the hands in order to begin the interaction

We need to add an Interactor prefab in our ControllerInteractor object

Interactors | Oculus Developers

INTERACTABLE

An Interactable is the object that is acted upon by the Interactors

Interactables | Oculus Developers

We need to add an Interactable object:

Each interactable need a collider, a rigidbody, Grabbable script and a Pointable Unity Event Wrapper

We needs also an Interactable prefab of the type of the interaction we want

ITERACTABLE EVENTS

You can attach Events Wrappers on interactables to trigger specific events

[Event Wrappers | Oculus Developers](#)

Different events:

- When Hover(): Raised when an Interactor hovers over the Interactable
- When Unhover(): Raised when the Interactable was being hovered but now it isn't
- When Select(): Raised when an Interactor selects the Interactable
- When Unselect(): Raised when the Interactable was being selected but now it isn't
- …

CREATE AN INTERACTION

Interactor:

1. Make a prefab of InteractionRigOVR-Synthetic Variant by dragging it in the project folder and add the prefab to our SampleScene

2. Search in project the ControllerGrabInteractor and drag it under the ControllerInteractors of the LeftController
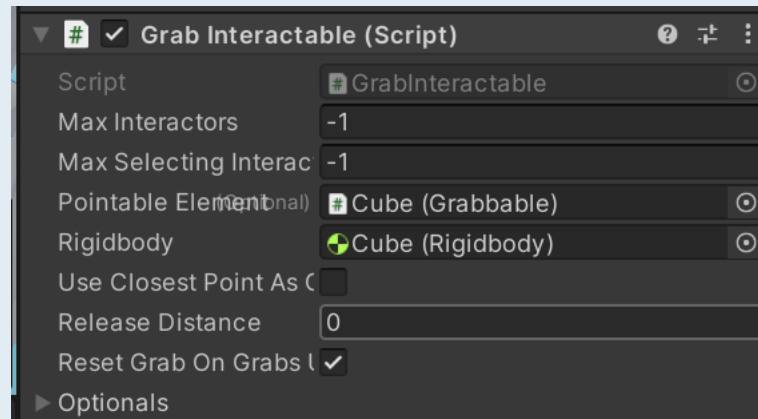
Interactable:

1. Create a Cube by right mouse button clicking in the Hierarchy > 3D Object > Cube

2. Add a RigidBody to the Cube

3. Add a Grabbable script to the Cube

4. Add a Pointable Unity Event Wrapper script to the Cube

CREATE AN INTERACTION

5. Create an Empty GO in the Cube and call it GrabbableInteractable

6. Add a Grab Interactable script to the GrabInteractable GO

7. Drag the Cube GO into the Pointable Element and RigidBody fields

8. Drag the GrabbableInteractable GO in the Interactable View of the Pointable Unity Event Wrapper of the Cube

SELECT 1/3

Let's try to add an event, we will use the Select event

We want to spawn an object when the Grab Interactable GO is grabbed:

1. In Hierarchy, create a GO with right mouse button > 3D Object > Sphere and add a Rigidbody and a Collider

2. Add the object into the Project's Asset folder to transform it into a Prefab and delete it from the scene

3. Create a script called 'ObjectInteraction' and open it (N.B. Add the script in the Example Scenes folder)

4. Create a new public field for the prefab: `public GameObject objectToSpawn;`

SELECT 2/3

5. Create a new public function to be called when the Select starts:

```
o memembrr
public void SelectStart()
{
    GameObject newObject;
    newObject = Instantiate(objectToSpawn, new Vector3(0, 0, 0), new Quaternion(0, 0, 0, 0));
    ...
}
```

6. In Unity window, select the Cube Interactable object and attach it the 'ObjectInteraction' script

7. Select the Cube Interactable object and in the Inspector, in the Object Interaction script, assign the prefab to the Object To Spawn field:

| ▼ # ✓ Object Interaction (Scrip ❓ 🎛 ⋮		
Script	# ObjectInteractior	⊙
Object To Spawn	🔷 Sphere	⊙
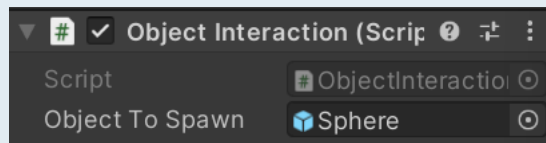
SELECT 3/3

8. In the Interactable Unity Event Wrapper component, search for the When Select() event

9. Click on + on the right, and add the Cube object in the Object field

10. Select ObjectInteraction > SelectStart() in function
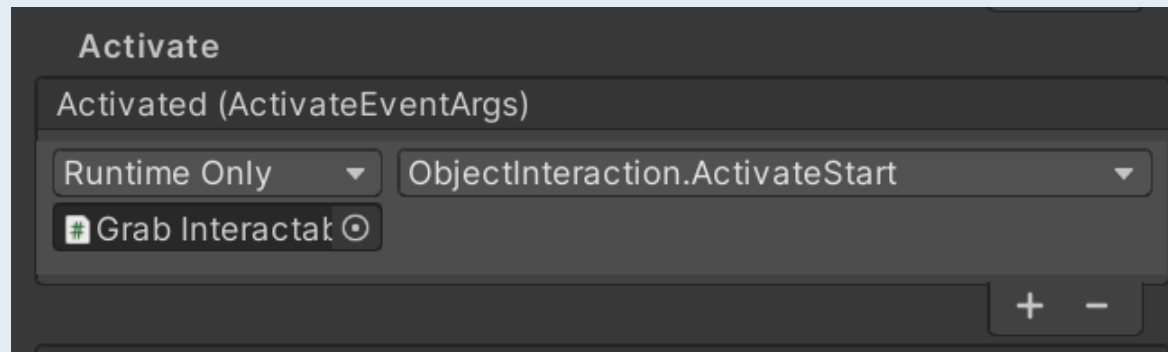
SELECT EVENT RESULT

Press play and grab the grabbable object

...see the result
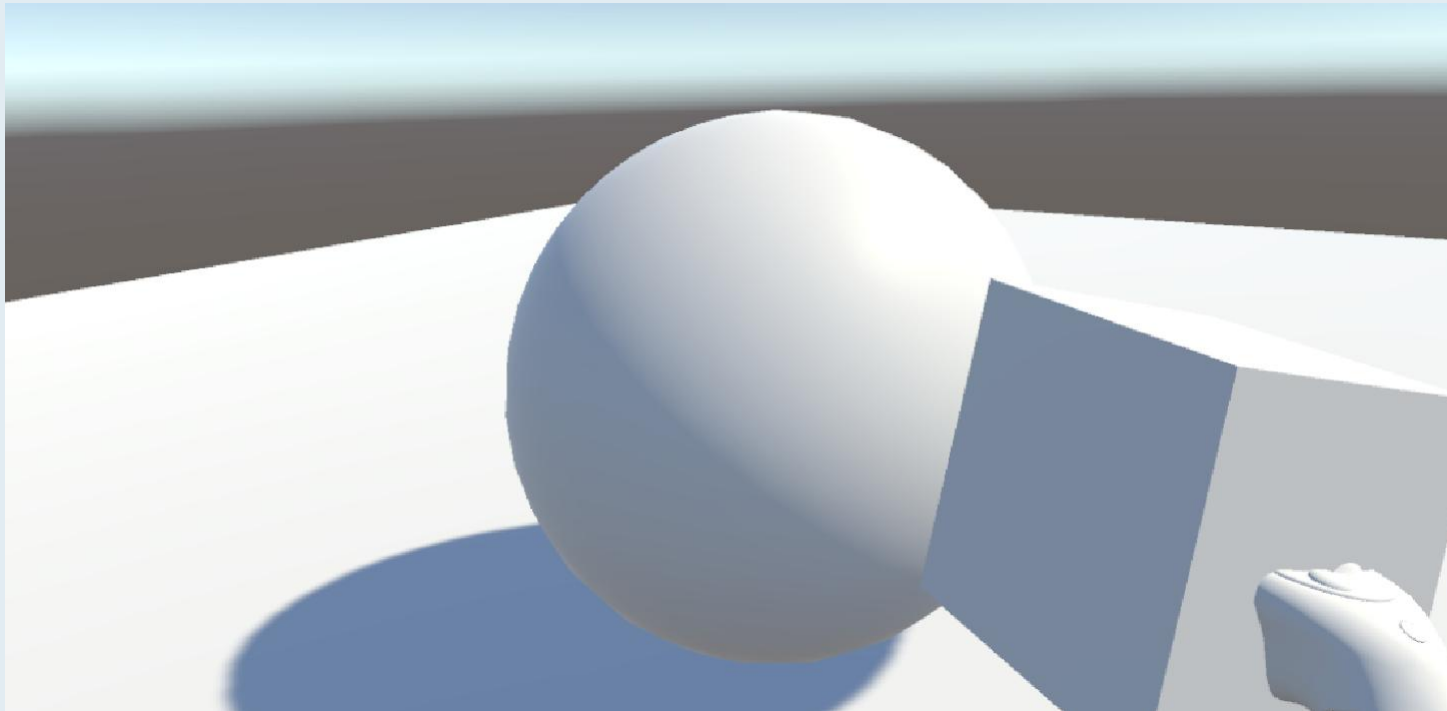
BUILD FOR ANDROID

BUILD FOR ANDROID

1. Make sure that the Android Build Support module is installed, otherwise:
   1. In Unity Hub, select Installs
   2. Select the gear near the Unity version you are using
   3. Select Add Module and install the Android Build Support

2. Open Edit > Project Settings
3. Open XR Plug-in Management
4. Select Android Settings [android icon] and check 'Oculus'
5. Select File > Build Settings > Android > Switch Platform
6. Drag your scene into Scenes In Build and click on Build button

N.B. remember to always deactivate the Simulator if you want to use the headset!