Microsoft

Hello Cube! with the HoloLens 2

ETH 2021

Patrick Misteli

2017

Msc in CS

ETH zürich

2019-2020

Premier Field Engineer
(Zurich)

Microsoft

Microsoft

Program Manager
(Paris)

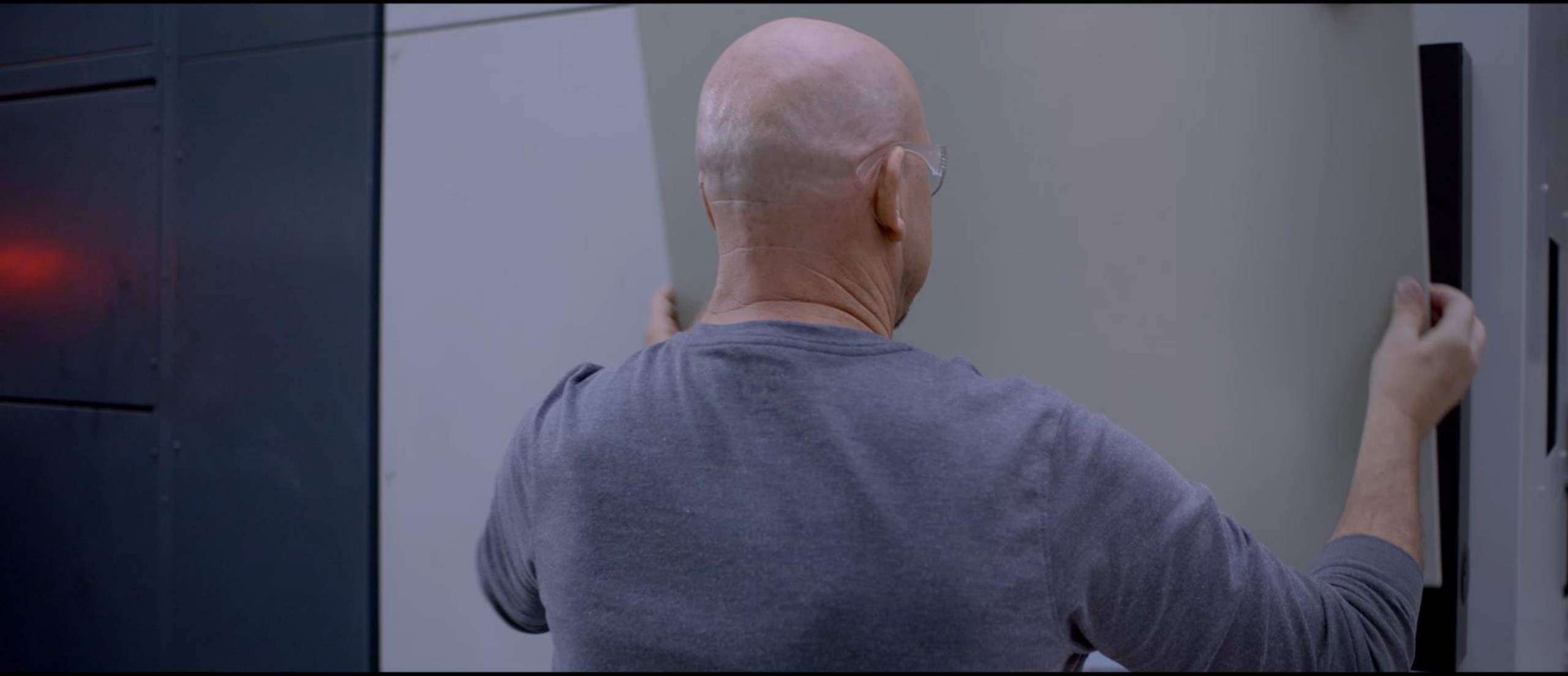
2017–2019

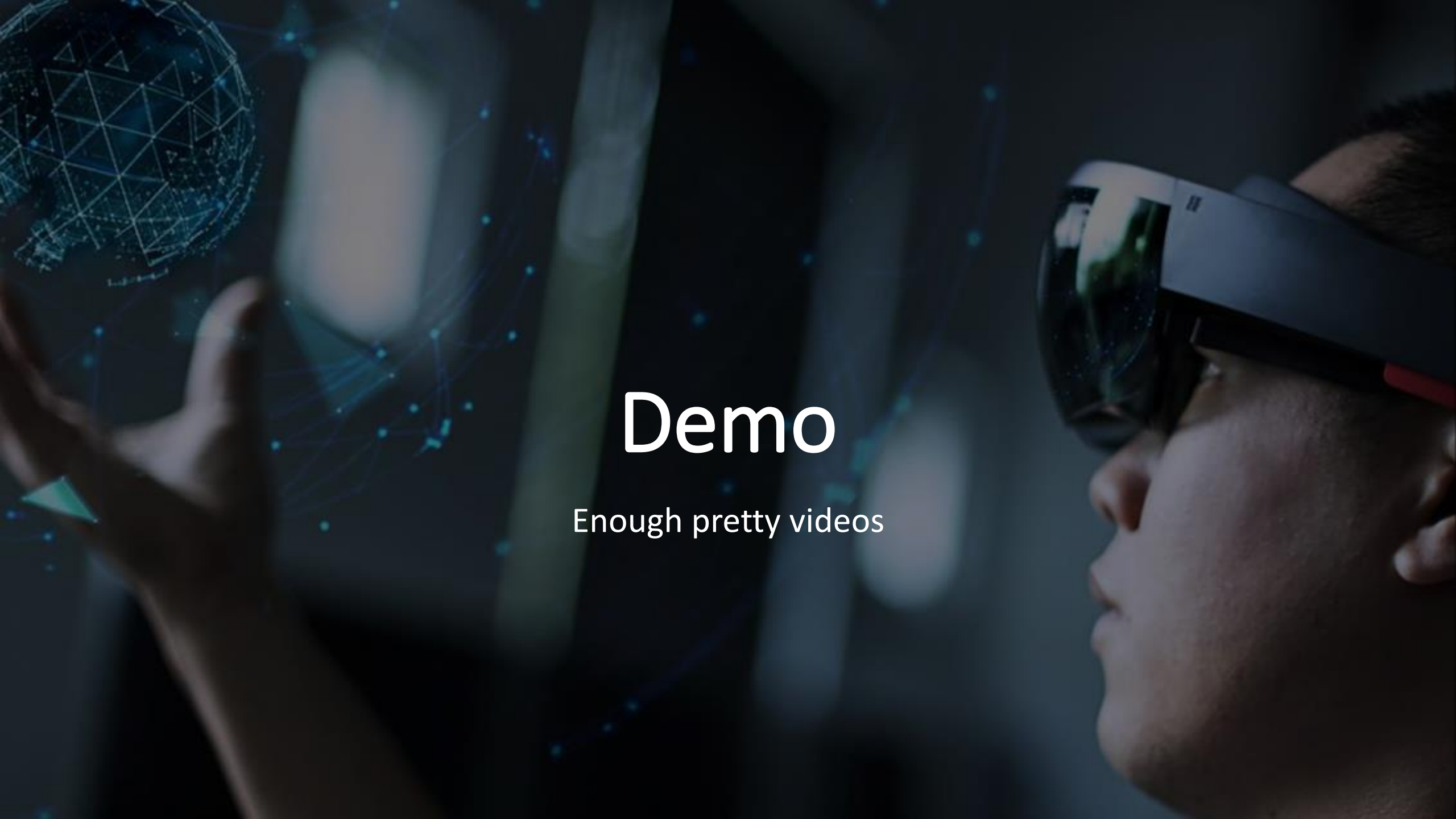
Microsoft

Program Manager
(MR & AI Lab Zurich)

2020-Now

Use Cases



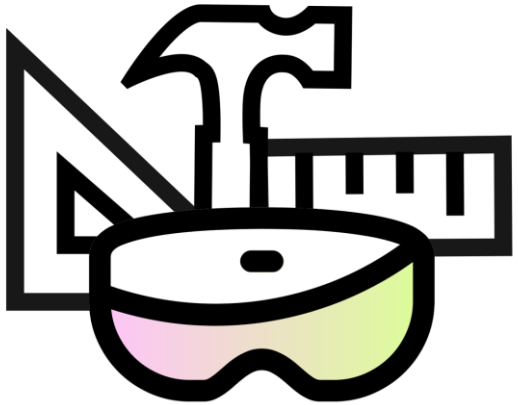


Demo

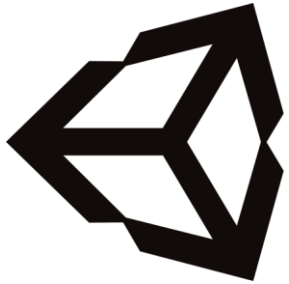
Enough pretty videos

Hello ~~World~~ Cube!

from “scratch”



MRTK
2.4.0



2020.3.19
unity

Visual Studio
2019 - 16.11.3

Install

Step-by-Step

Install Stuff

1.Install Visual Studio 2019- 16.11.3
- Desktop Development C++
- *Game development with Unity*
- *Universal Windows Platform (UWP) development*
  - *Windows 10 SDK version 10.0.19041.0 or 10.0.18362.0*
  - *USB Device Connectivity (required to deploy/debug to HoloLens over USB)*
  - *C++ (v142) Universal Windows Platform tools (required when using Unity)*

2.Install Unity 2020.3.19
- Universal Windows Platform Build Support
- Windows Build Support (IL2CPP)
- Documentation

3.Download Mixed Reality Feature Tool - MRFT

Open Stuff

1.Open Unity Hub
2.Create new 3D project
3.Open Mixed Reality Feature Tool
- Select project root folder → Discover Features →Refresh
- Select the following
  - *Mixed Reality Toolkit Foundation*
  - Platform Support → *Mixed Reality OpenXR Plugin*
- **Get Features → Import→ Approve**

4.Go back to Unity Window to trigger package import
- restart if asked about new input system

Configure Unity Stuff

1.File → Build Settings → Universal Windows Platform → Switch Platform
2.MRTK Project Configurator
- Unity OpenXR plugin (recommended)
- Show XR Plug-in Man → XR Plug-in man → OpenXR + Microsoft HoloLens feature group
- Important – for first time setup only → Apply Settings
- Press on yellow warning symbol next to OpenXR → Fix All
- Next, Apply, Apply

Configure Scene Stuff

1.Mixed Reality → Toolkit → Add to scene and configure…
2.Right Click on the GameObject MixedRealityPlayspace →3d Object → Cube
3.Click on GameObject Cube → Position = 0,0,2; Scale = 0.3, 0.3, 0.3

Prepare Deployment Stuff

- Settings → Update & Security
  → For Developers
  → Developer mode: ON

Deploy Stuff

1.File → Build Settings
- Add Open Scenes
- Build → Create “Build” folder

2.Connect your HL2 via USB
3.Open .sln from Build Folder
4.Change
- “Debug” to “Release”
- Solution Platform to “ARM64”
- “Remote Machine” to “Device”

5.Debug → Start Without Debugging

Things to Try

Change project Name

Edit → Project Settings
Player → Publishing Settings → Package Name (will overwrite preexisting)
Player → Publishing Settings → Product Name (display name)

Add Button prefab

Look for *PressableButtonHoloLens2*
Import other MRTK packages for more options

Rotating the Cube

Add Script to gameobject and rotate in “Update” method.

Remove spatial grid

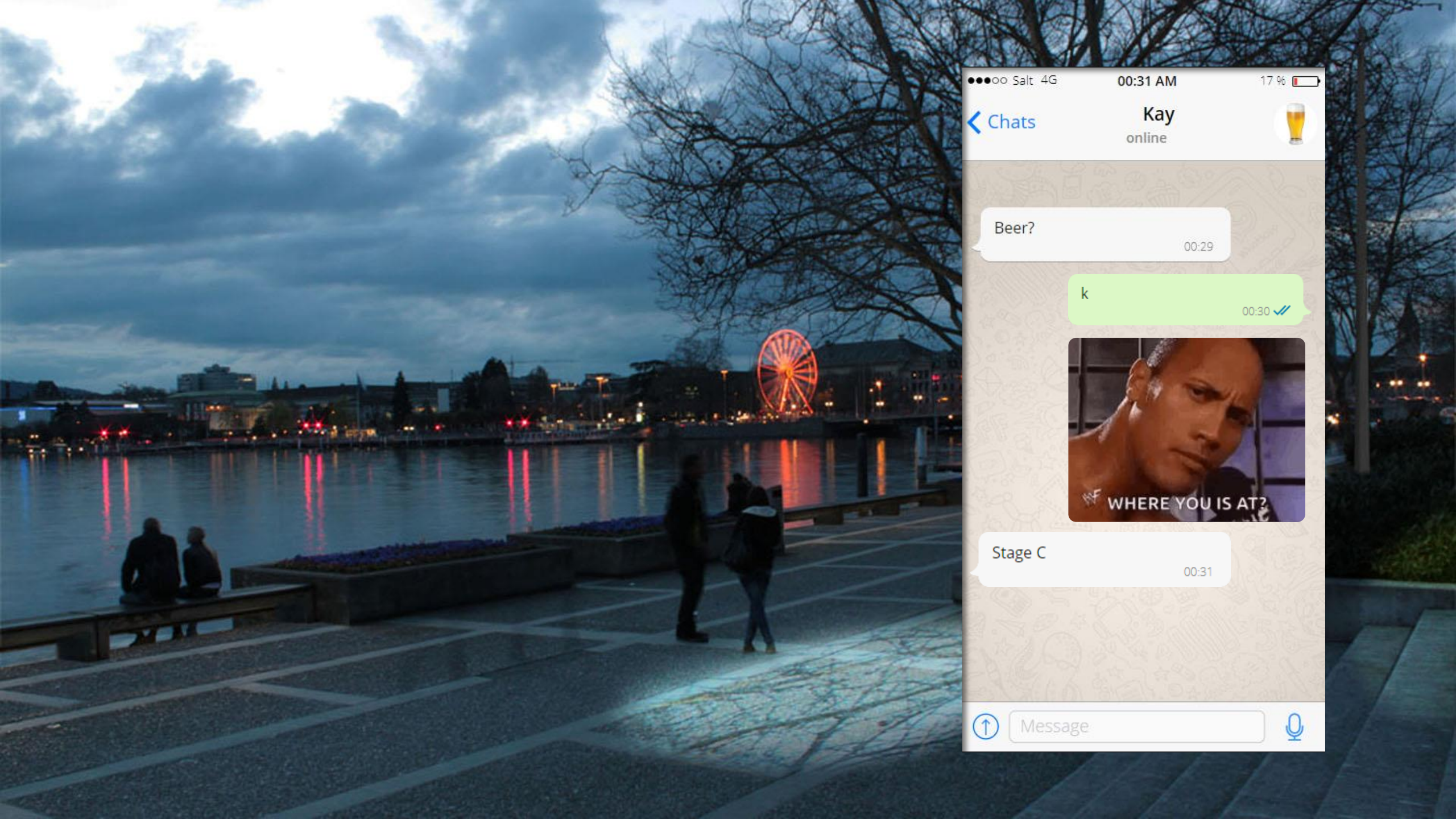
Gameobject *MixedRealityToolkit*
DefaultHoloLens2ConfigurationProfile

Interact with Object

Add *ObjectManipulator* + *NearInteractionGabbable*
(+Collider if not there already)

Azure Spatial Anchors

Street Parade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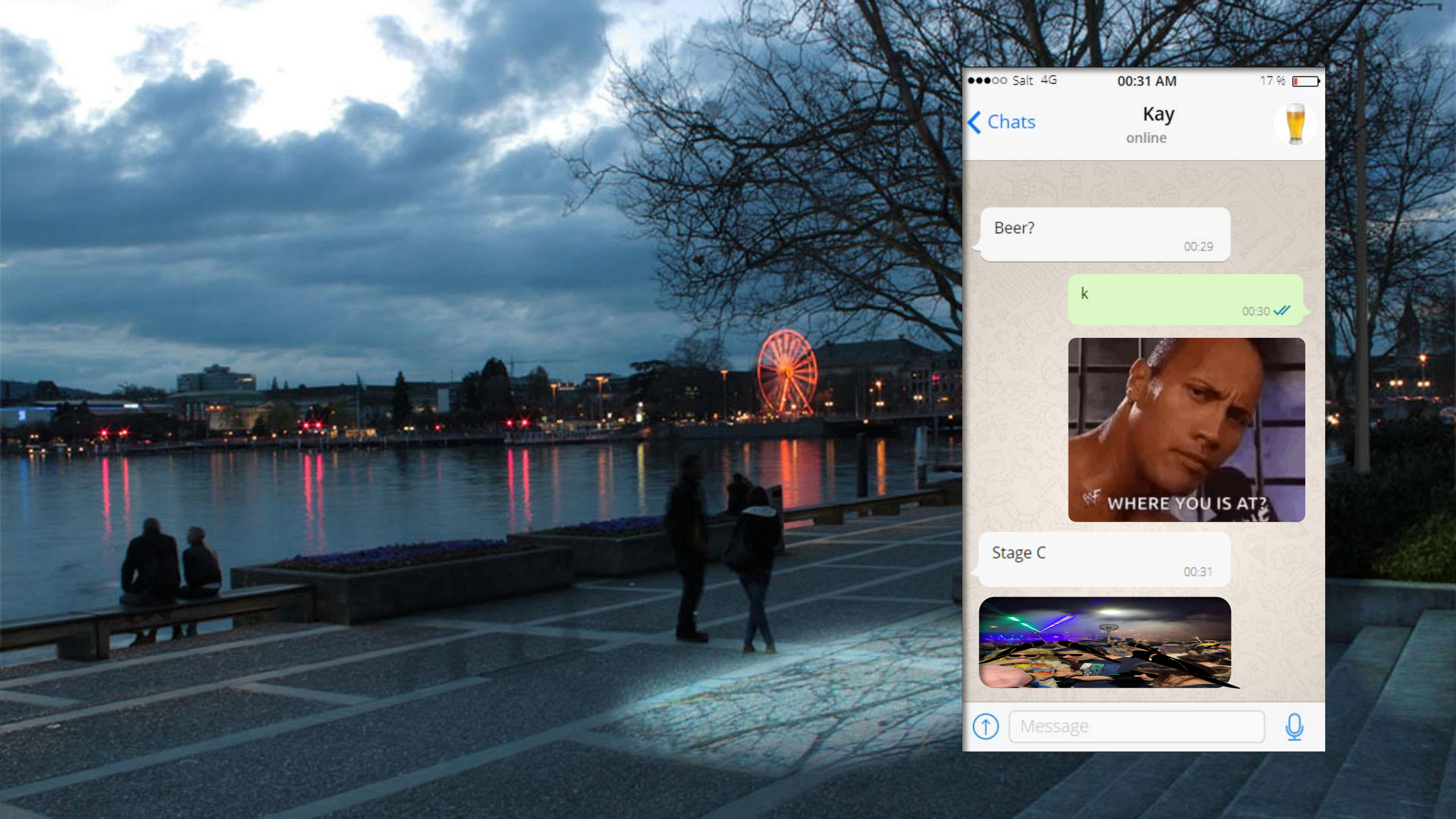
00:30
WHERE YOU IS AT?
Stage C
00:31
Message


Stage C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WHERE YOU IS AT?
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Azure Spatial Anchors

Azure Spatial Anchors

What now?

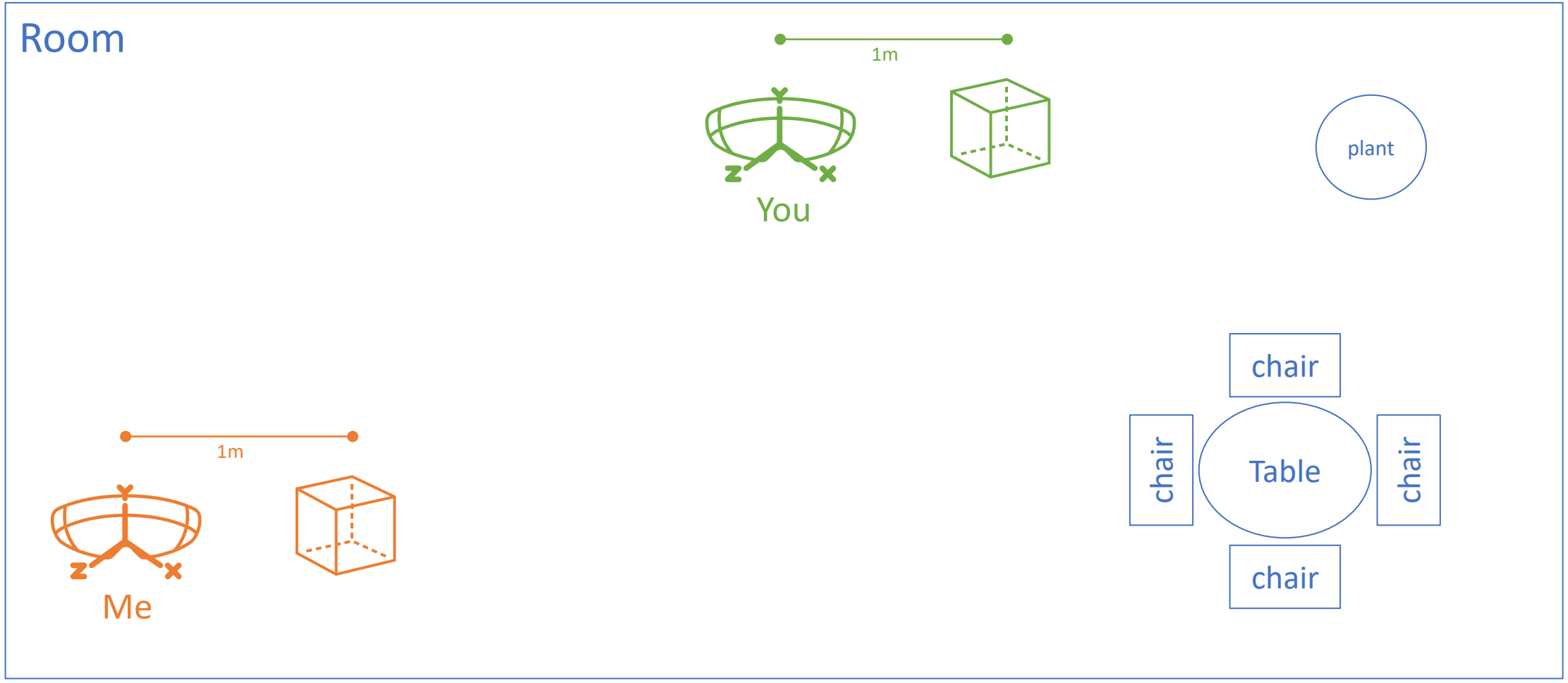
- Persistence

What now?

- Persistence

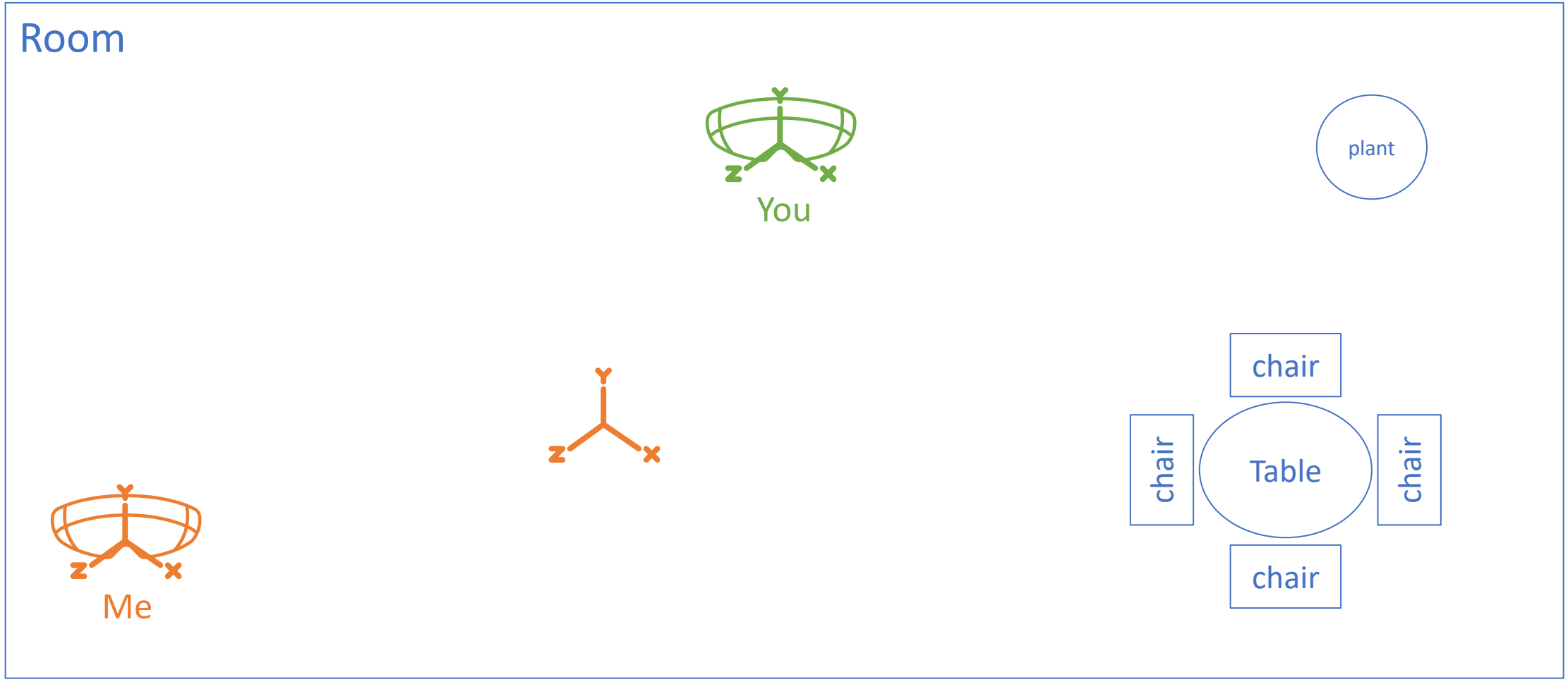
What now?

- Sharing



What now?

- Sharing



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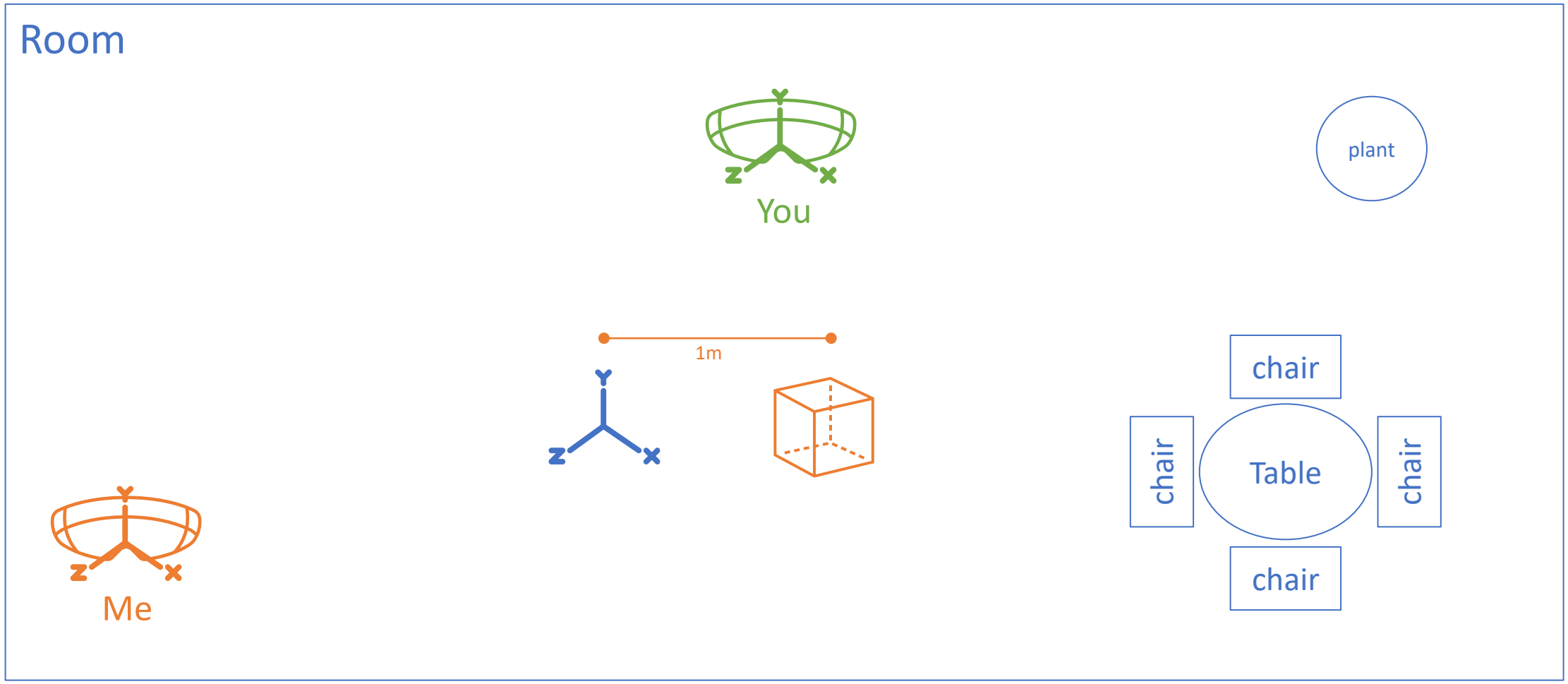
- Sharing



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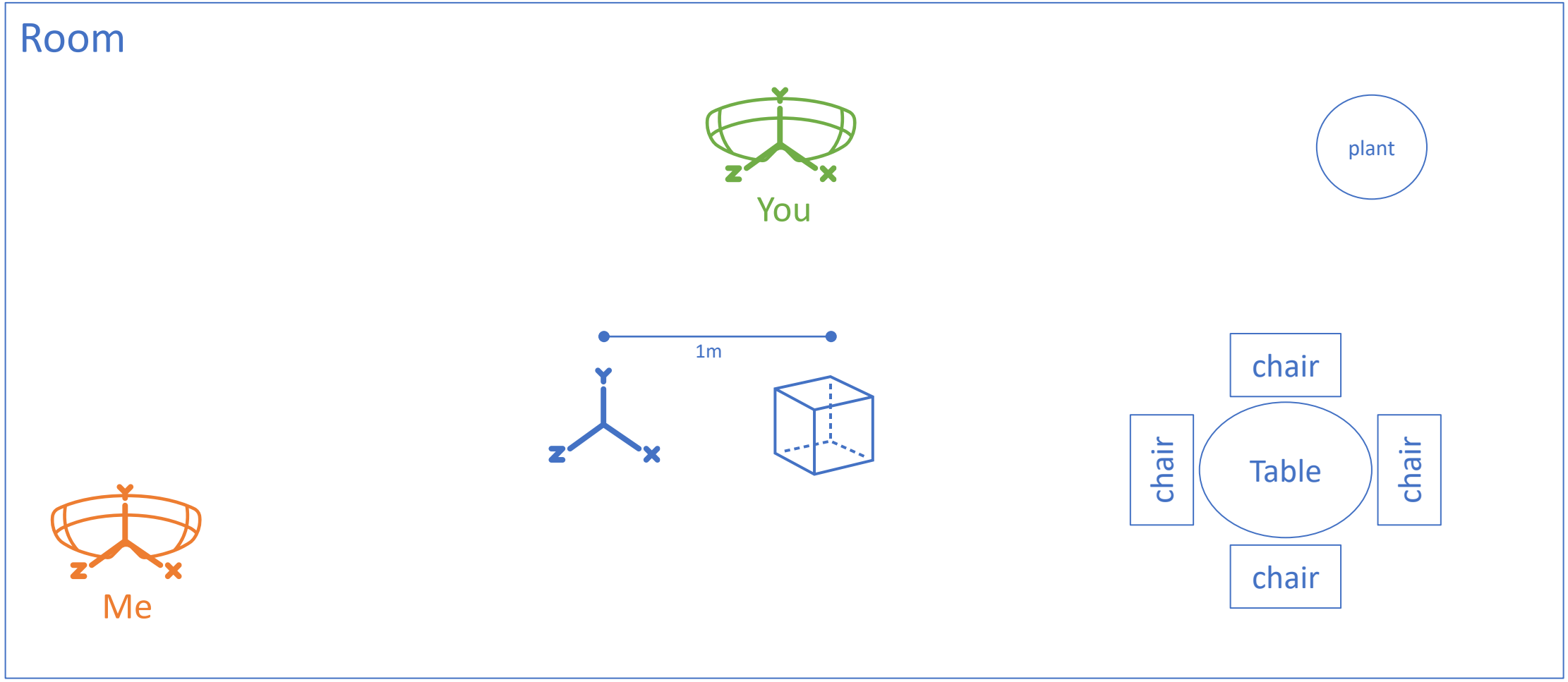
- Sharing



Example App

Beerpong


Azure


Yo
Clients:
A
B
C
D

Clients:

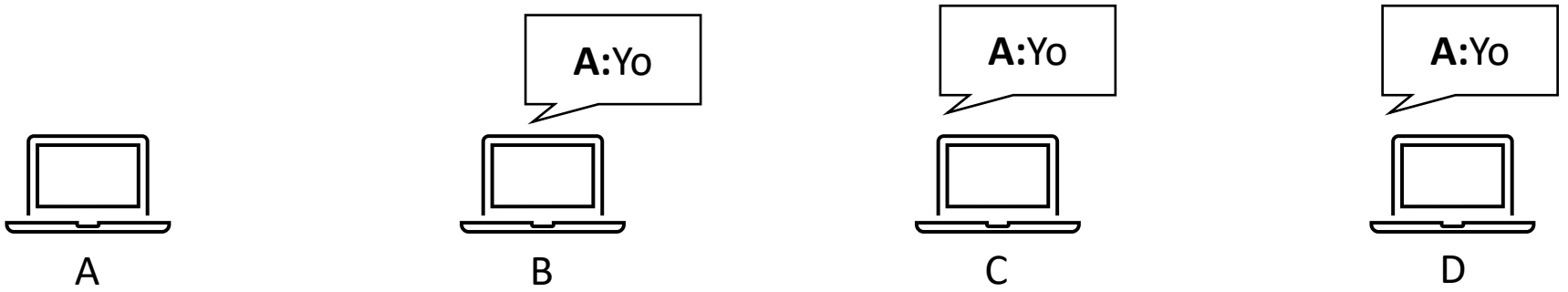

A


B


C


D


Azure


A:Yo
A:Yo
A:Yo
Clients:
A
B
C
D


Azure


lol
Clients:
A
B
C
D

Clients:


A


B

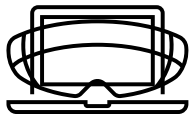

C

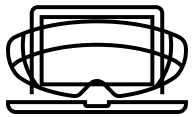

D

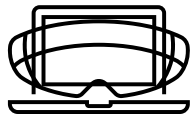

Azure

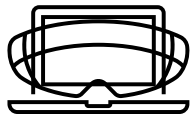

C:lol
C:lol
C:lol
Clients:
A
B
C
D

Clients:


A


B


C


D

ASA_ID = 123-456-789

Clients:

A

B

C

D

Clients:

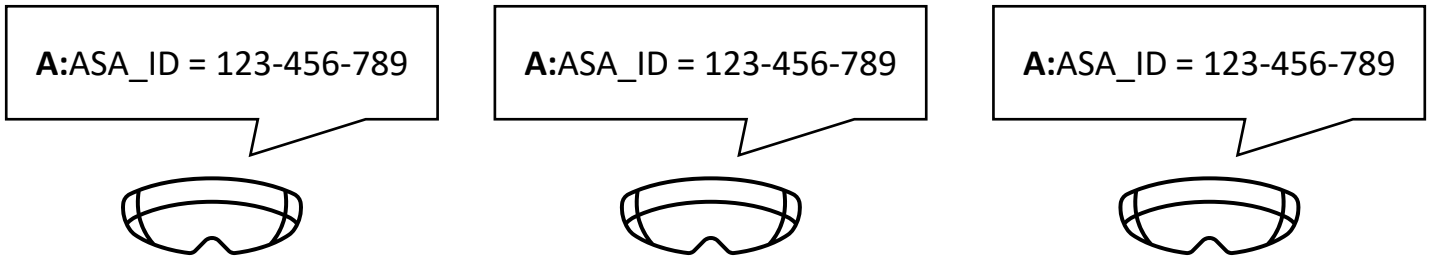

A


B


C


D


Azure


A:ASA_ID = 123-456-789
A:ASA_ID = 123-456-789
A:ASA_ID = 123-456-789
Clients:
A
B
C
D

Move_Ball = (1,0,2)




Clients: A B C D

Clients:

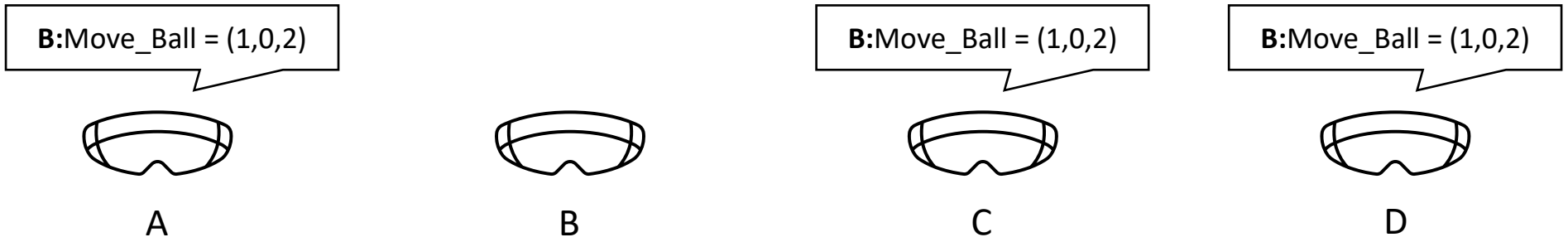

A


B


C


D


Azure


B:Move_Ball = (1,0,2)
B:Move_Ball = (1,0,2)
B:Move_Ball = (1,0,2)
Clients:
A
B
C
D