

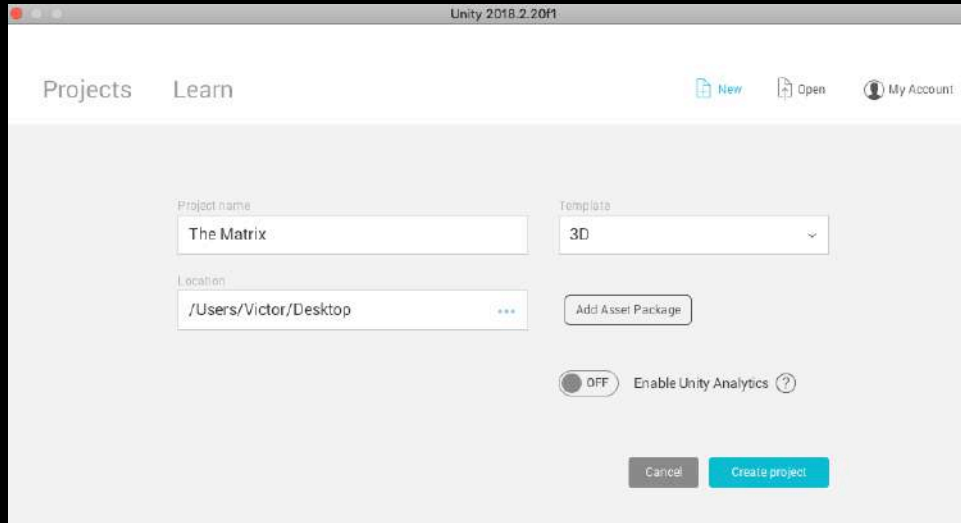
Hands on tutorial: The Matrix vs. Tom Cat



Supported by Udemy course: “Máster Realidad Aumentada con Unity 3D, Vuforia y C#”

New Unity + Vuforia Project

Option 1: The Matrix



Unity 2018.2.20f1

Projects Learn

New Open My Account

Project name
The Matrix

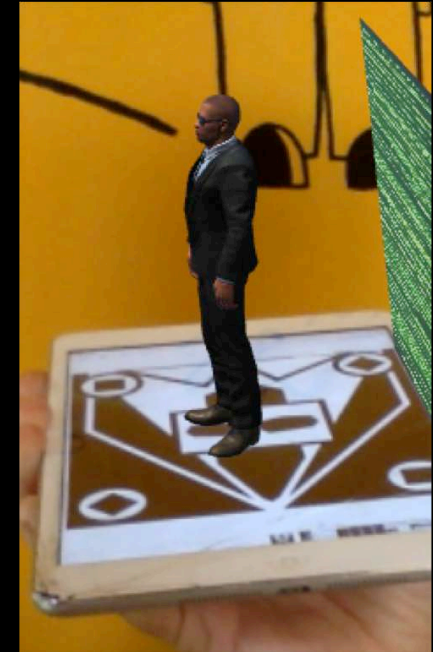
Template
3D

Location
/Users/Victor/Desktop

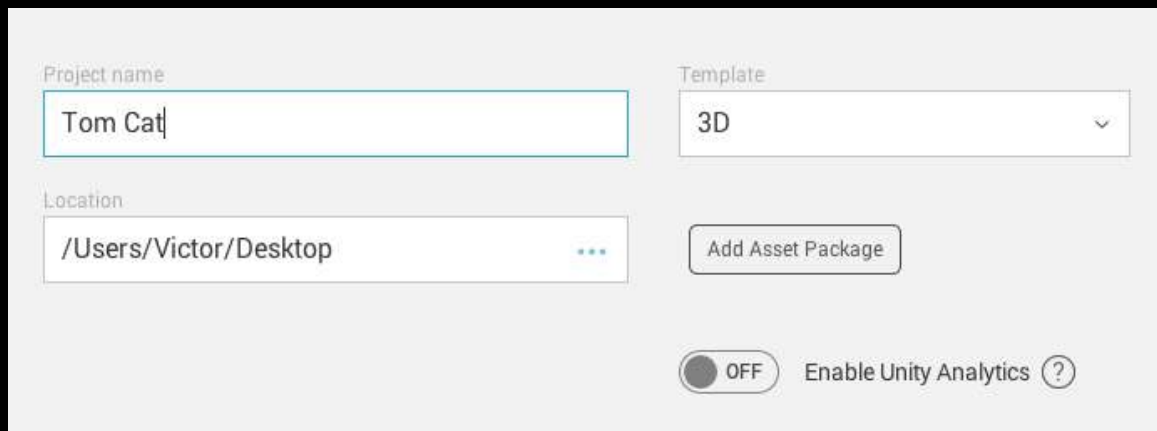
Add Asset Package

OFF Enable Unity Analytics ?

Cancel Create project



Option 2: Tom Cat



Project name
Tom Cat

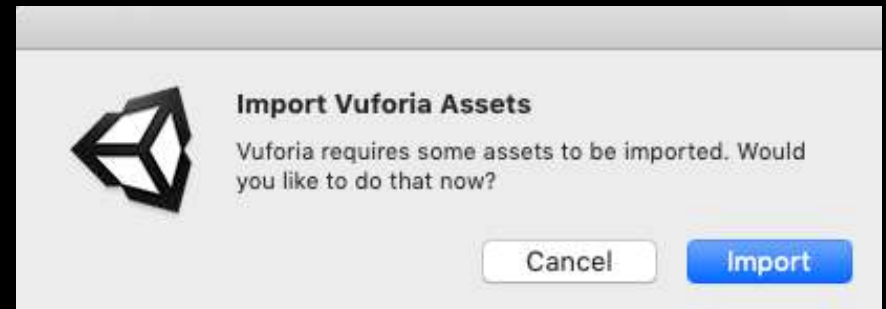
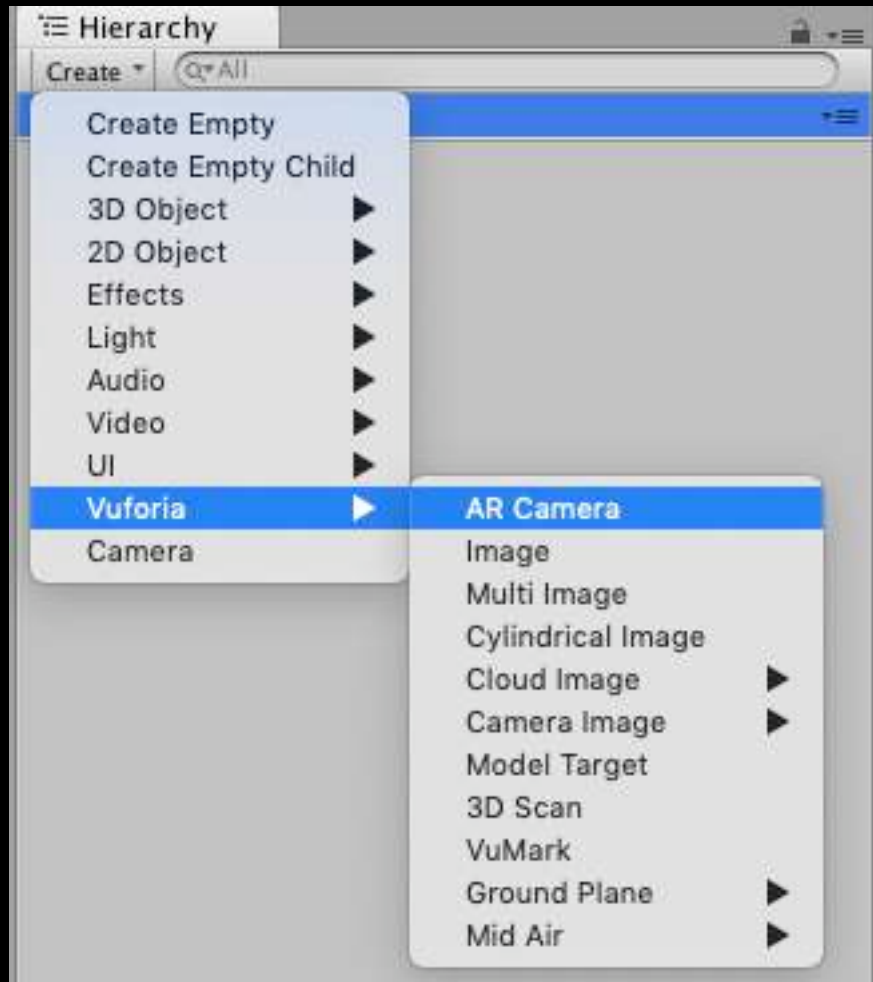
Template
3D

Location
/Users/Victor/Desktop

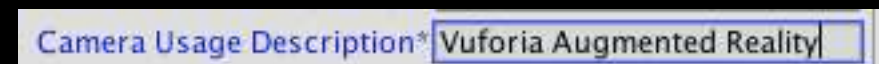
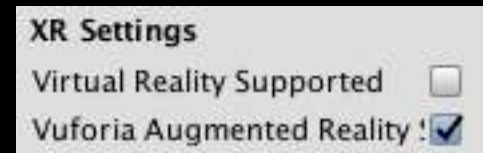
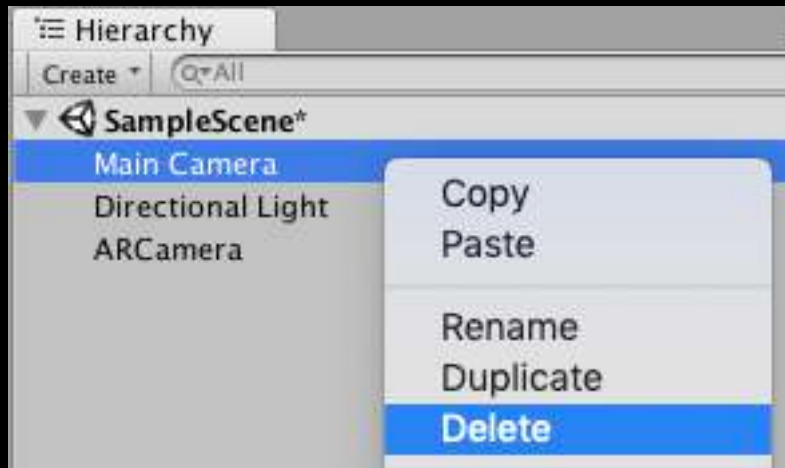
Add Asset Package

OFF Enable Unity Analytics ?

Import Vuforia Assets

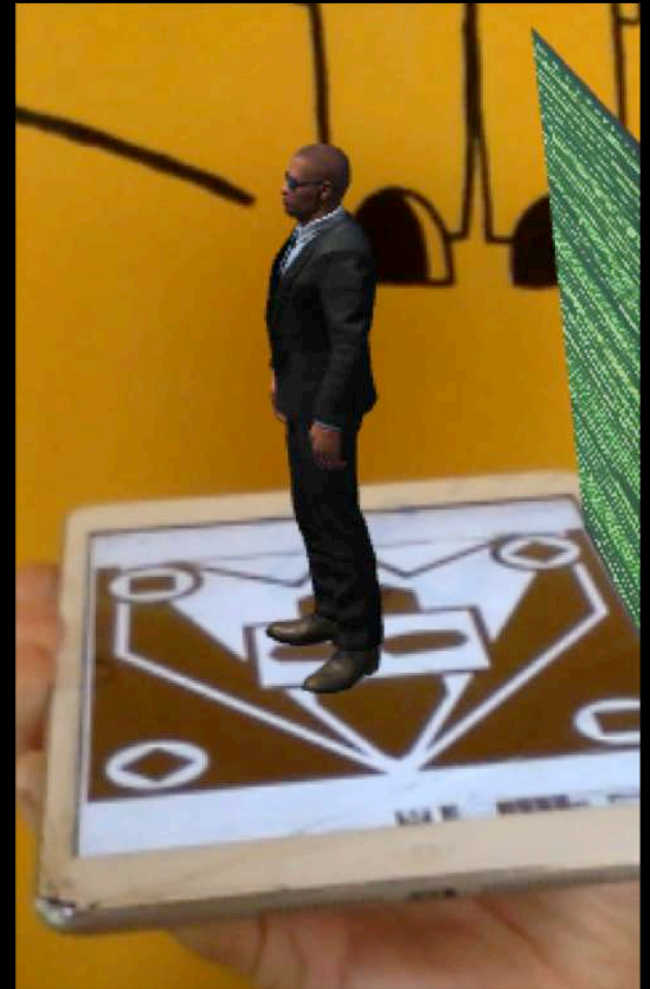
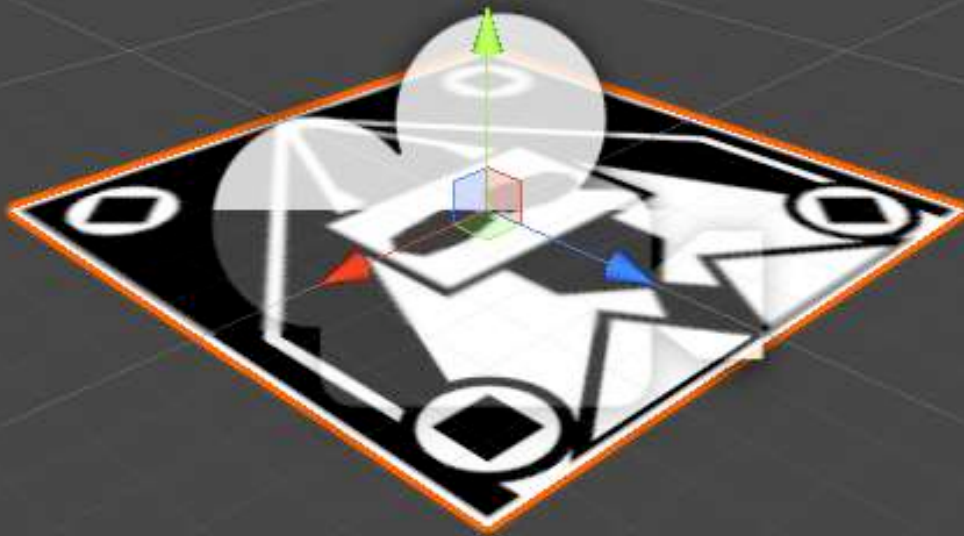


Remove Main Camera and configure your build settings for Android/iPhone



Part 1

Matrix Scene: Agent Smith (image target)



Alternative Tom Cat Scene



Add license – copy Vuforia license key

RAA2018

[Edit Name](#)

[Delete License Key](#)


License Key

Usage

Please copy the license key below into your app

```
ARw5RRX/////AAABmf4x8KRI3EOKldd3FRT3RooqTlp  
eFlRc3j+UrYoFzQyXQDg+I3AibB1zI4WWIhX0clecvG  
1EbMzxZIt+AI/AFyrnCEMwefUJldlryfJXvUaWLXAcD  
5CVd2YMh5IX7c0EuCEogAYDrVpVbH++7BvAGCZDkqe8  
zLw9Emw/bmBtaJBmpHPYya4Kmm4DfPEsiEUaoEiH2Y
```

ARCamera

 ☒ Vuforia Behaviour (Script)

[Download new Vuforia version: 7.5.26](#)

World Center Mode

DEVICE

[Open Vuforia configuration](#)

[App License Key](#)

```
ARw5RRX/////AAABmf4x8KRI3EOKldd3F  
RT3RooqTlpfdnXeV9MheFlRc3j+UrYoFzQ  
vXODa+I3AibB1zI4WWIhX0clecvG10/e7U
```

[Add License](#)

Add & Import Image Target

Add Target

Type:



Single Image

File:

Matrix.jpg

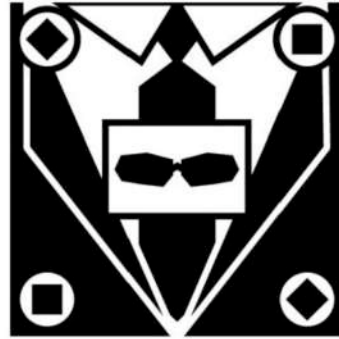
.jpg or .png (max file 20 MB)

Width:

1

Matrix-1

Edit Name Remove



Type: Single Image
Status: Active
Target ID: f5c9c3d8-7d2c-4331843b90d9448b97
Augmentable: ★★★★★
Added: Nov 20, 2018 01:31
Modified: Nov 20, 2018 01:31

Download Database (All)

Download Database

1 of 1 active targets will be downloaded

Name:
RAA2018Dev

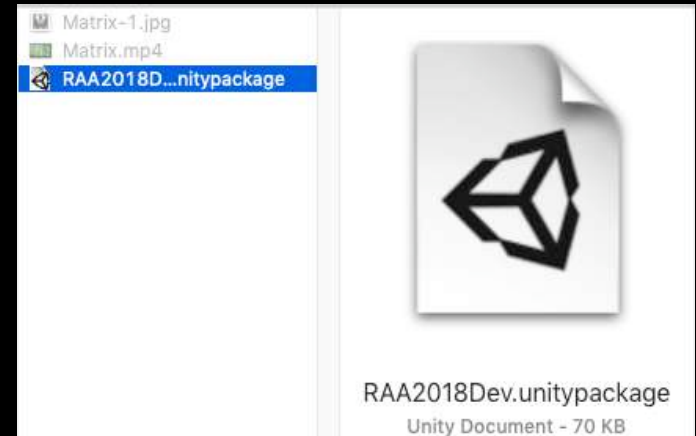
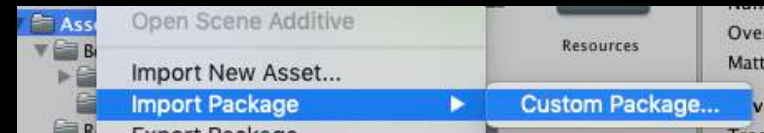
Select a development platform:

- ☐ Android Studio, Xcode or Visual Studio
☒ Unity Editor

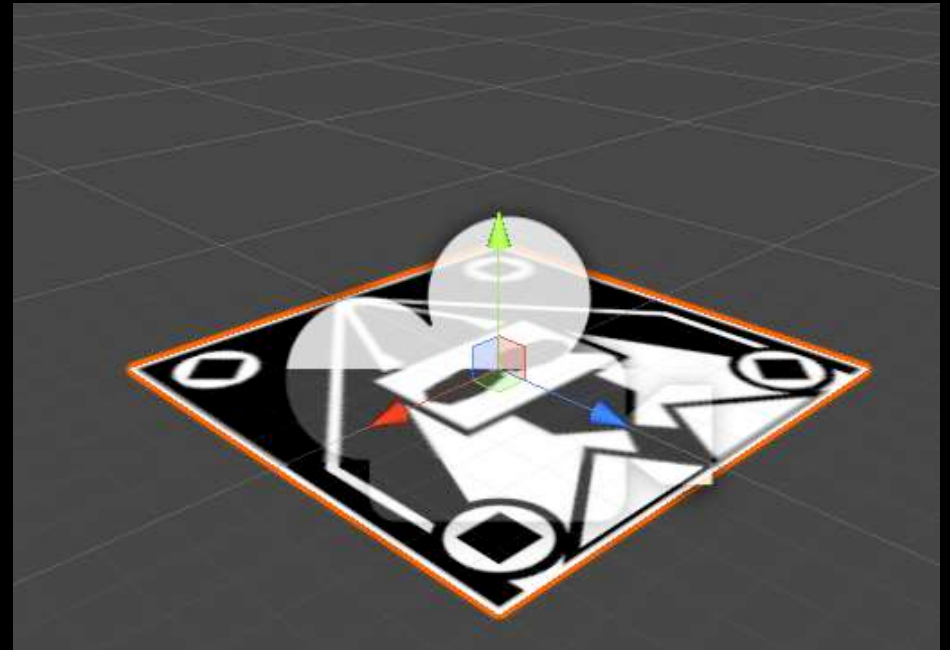
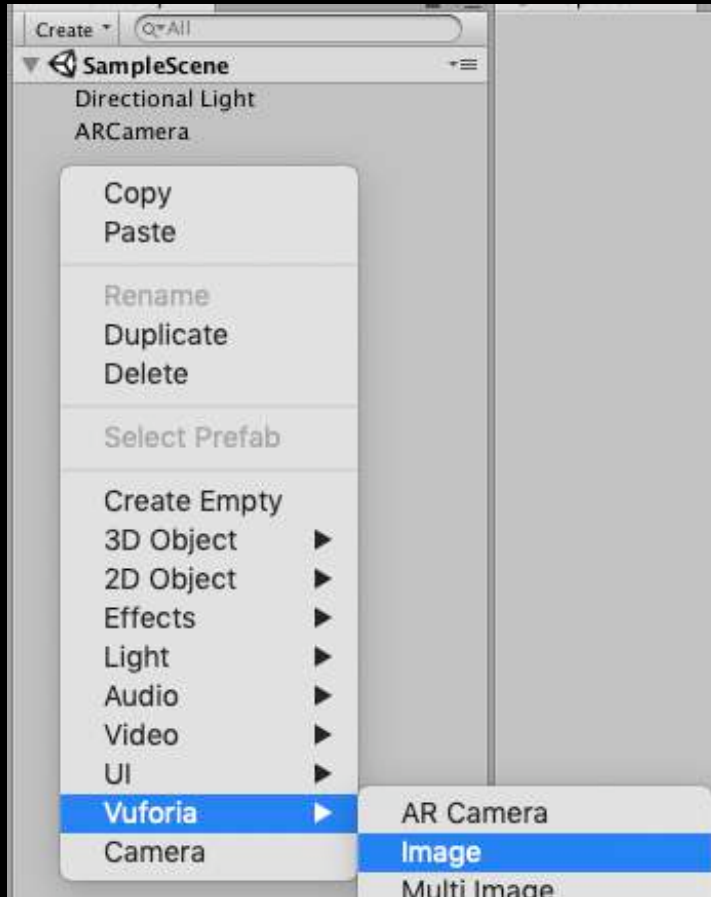
Cancel

Download

Right click on Assets



Add Image Target to Scene




Older versions: Unity finds and adds the image target automatically

Newer versions: Fix Image Target Behaviour and Vuforia Configuration Databases

Handling Target Events

ImageTarget

▼  ☒ Default Trackable Event Handler (Script)
Script DefaultTrackableEventHandler

```
// Vuforia is starting,  
// Call OnTrackingLost()  
OnTrackingLost();
```

```
if (newStatus == TrackableBehaviour.Status.DETECTED ||  
    newStatus == TrackableBehaviour.Status.TRACKED ||  
    newStatus == TrackableBehaviour.Status.EXTENDED_TRACKED)  
{  
    Debug.Log("Trackable " + mTrackableBehaviour.TrackableName + " found");  
    OnTrackingFound();  
}
```

Customised target handler (copy & paste, edit)



Replace Default Trackable Event Handler (Script) with new customised Event Handler



ImageTarget



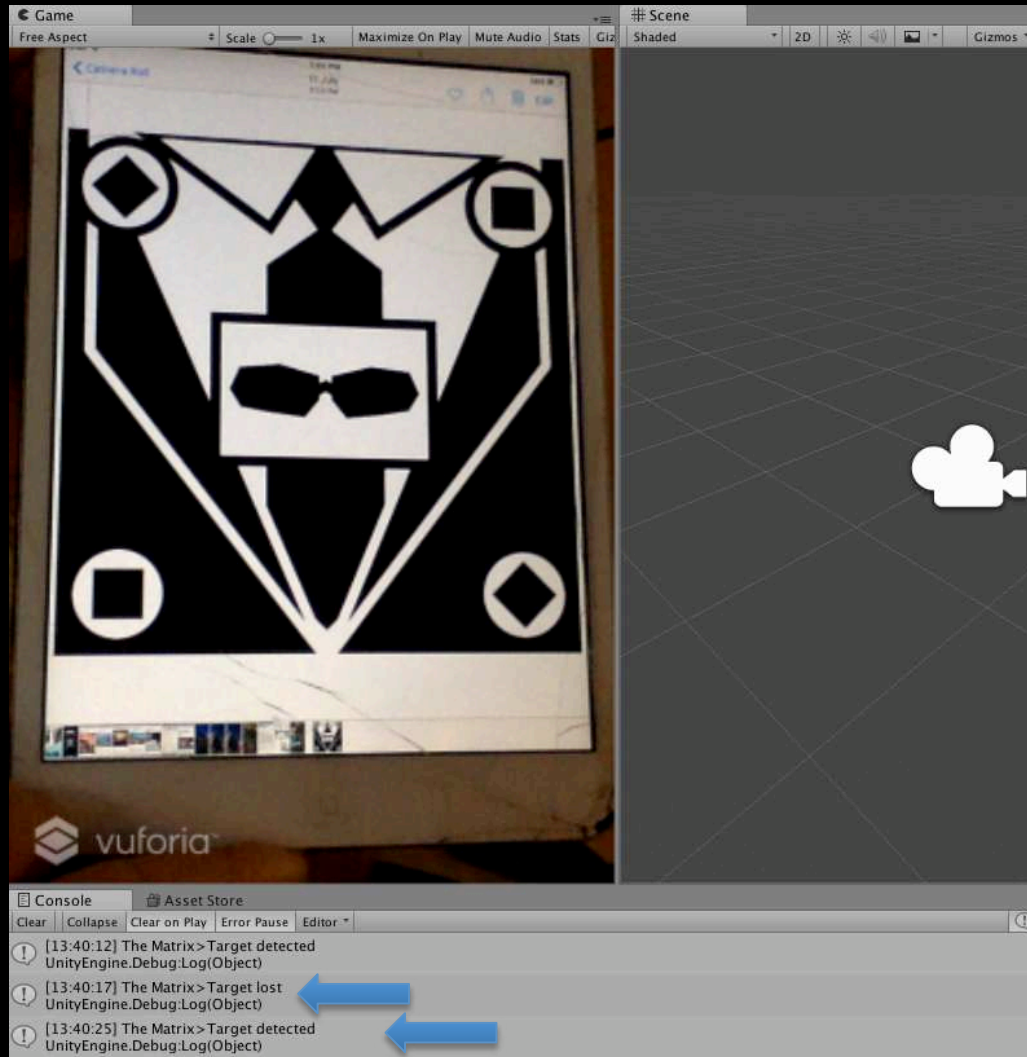
```
using UnityEngine;
using Vuforia;

public class TheMatrix : MonoBehaviour, ITrackableEventHandler
{
    protected TrackableBehaviour mTrackableBehaviour;

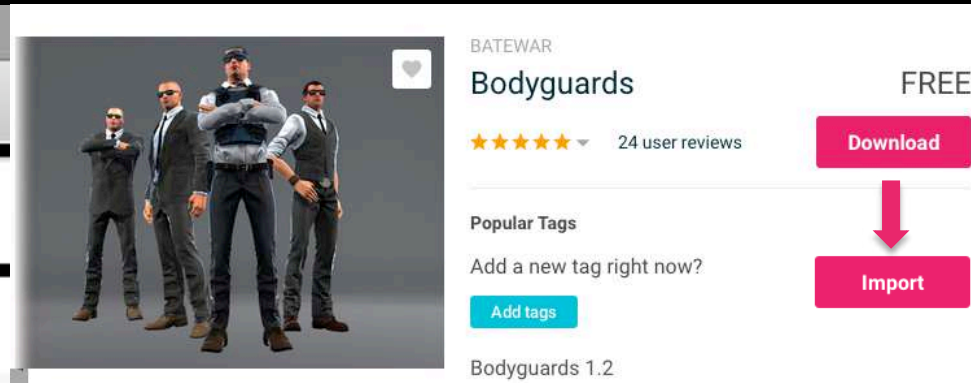
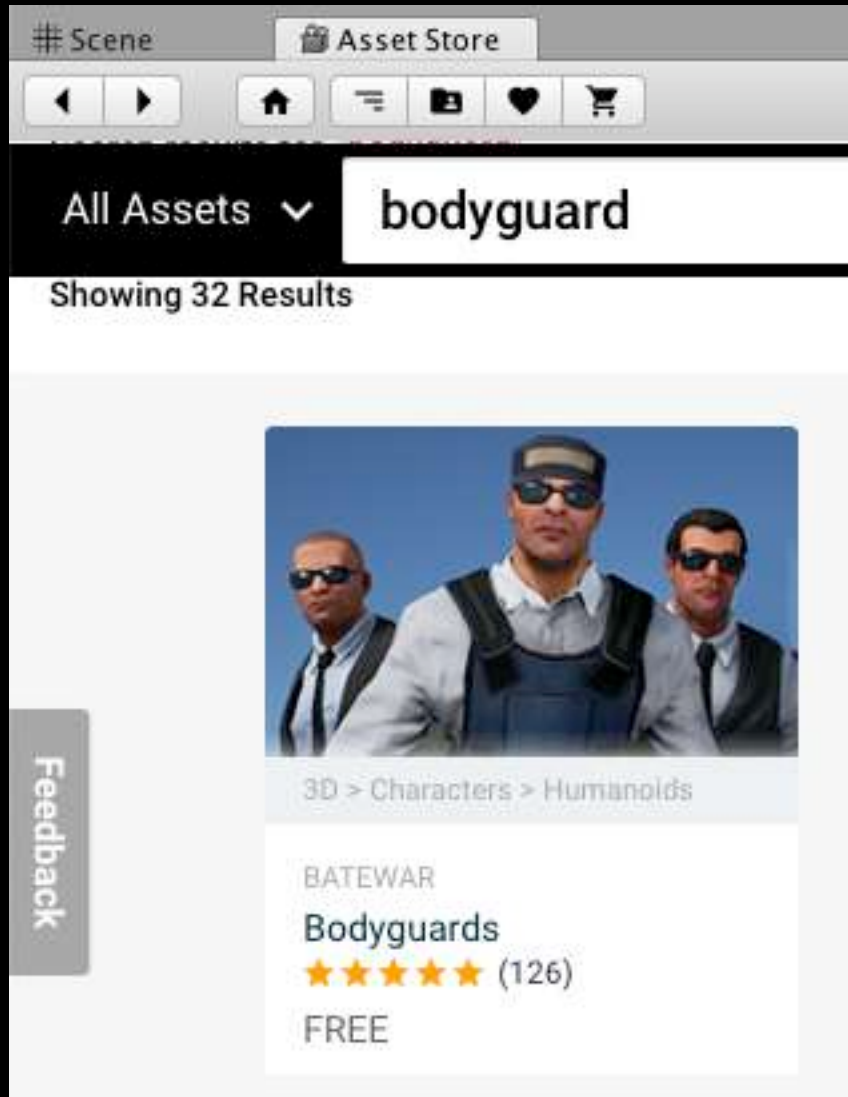
    void Start () {
        mTrackableBehaviour = GetComponent<TrackableBehaviour>();
        if (mTrackableBehaviour)
            mTrackableBehaviour.RegisterTrackableEventHandler(this);
    }

    public void OnTrackableStateChanged(
        TrackableBehaviour.Status previousStatus,
        TrackableBehaviour.Status newStatus)
    {
        if (newStatus == TrackableBehaviour.Status.DETECTED ||
            newStatus == TrackableBehaviour.Status.TRACKED ||
            newStatus == TrackableBehaviour.Status.EXTENDED_TRACKED)
        {
            Debug.Log("The Matrix>" + "Target detected");
        }
        else if (previousStatus == TrackableBehaviour.Status.TRACKED &&
            newStatus == TrackableBehaviour.Status.NO_POSE)
        {
            Debug.Log("The Matrix>" + "Target lost");
        }
        else
        {
            Debug.Log("The Matrix>" + "Tracking starts");
        }
    }
}
```


Handling Target Events



Download and import a (free) 3D Model 🕶️



Import Cat 3D Model 🐱

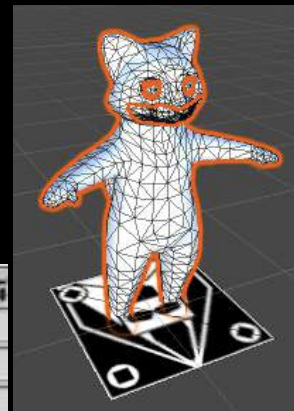
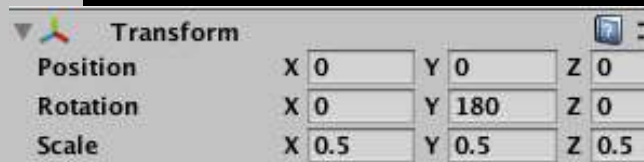
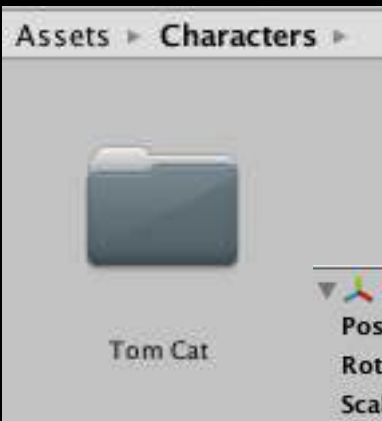
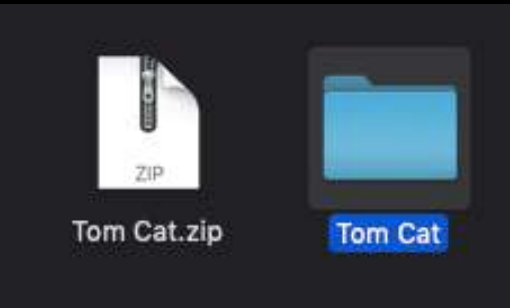
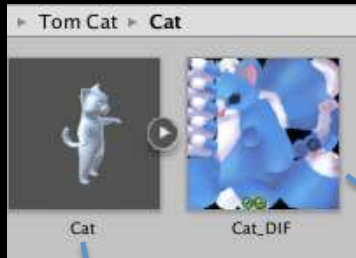
Tom Cat

- Tom Cat character
- Cat Bat character
- Video TomJerry

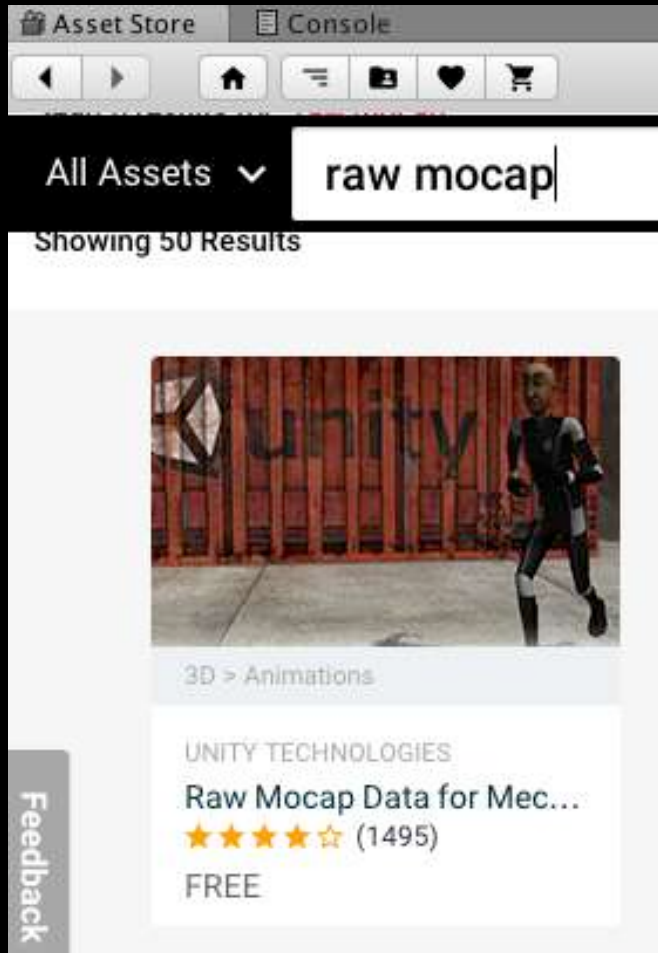


Fix textures

Hierachy: Cat: Cat

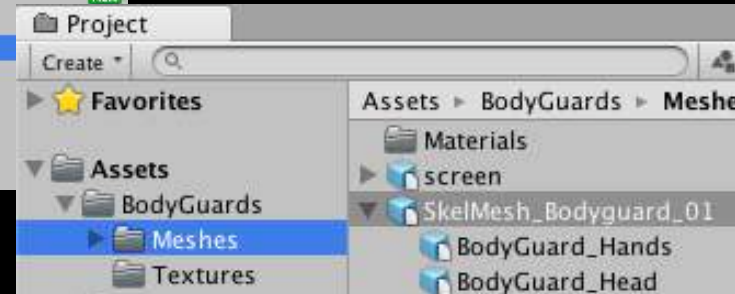
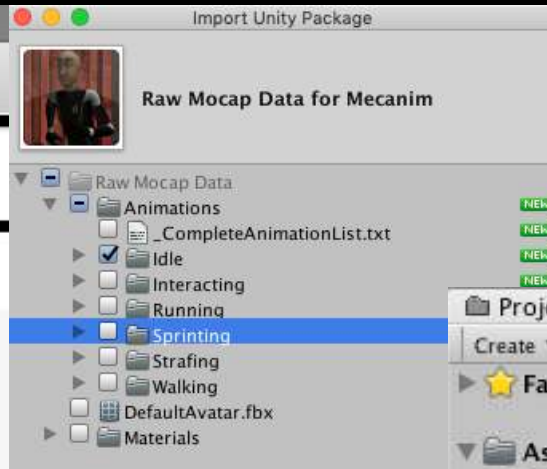


Download and import animation

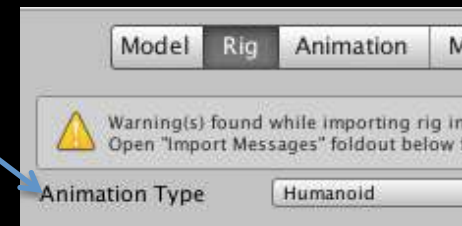


1 month ago: Free Unity animations 🤔
Today:

 [Unity humanoid animations](#)

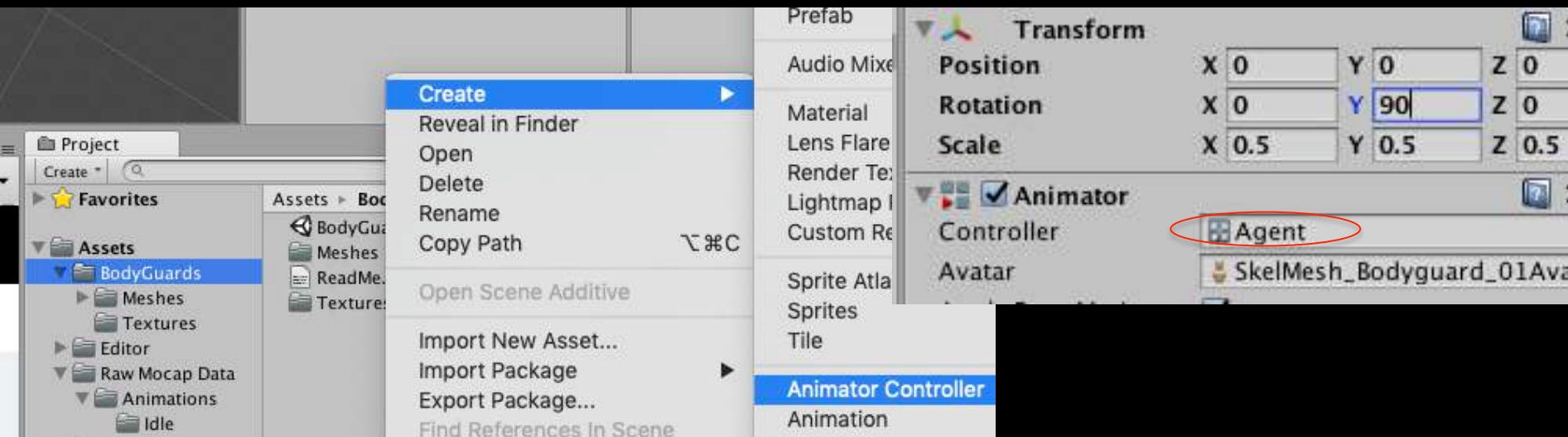
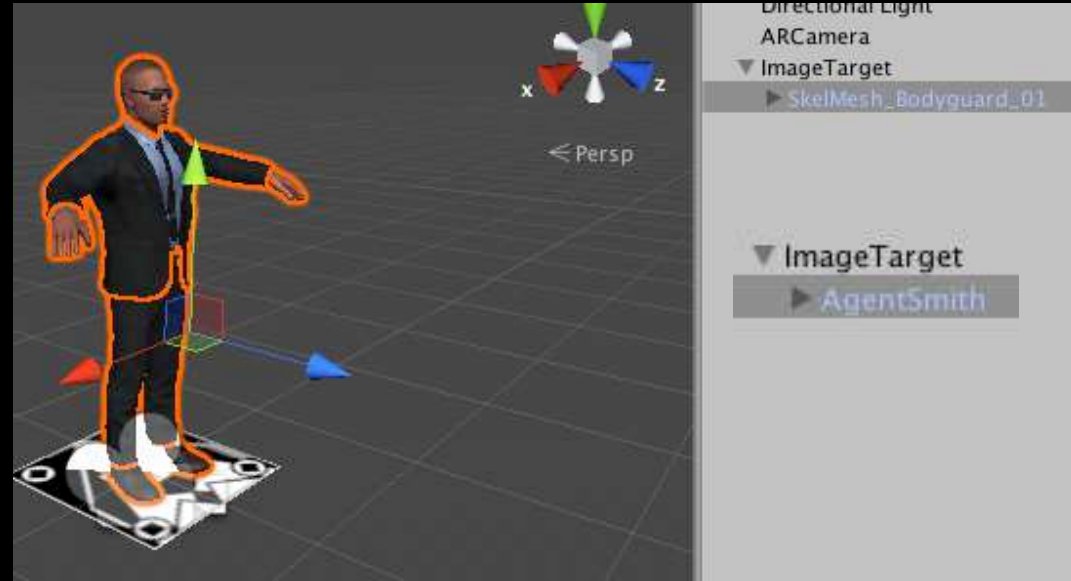
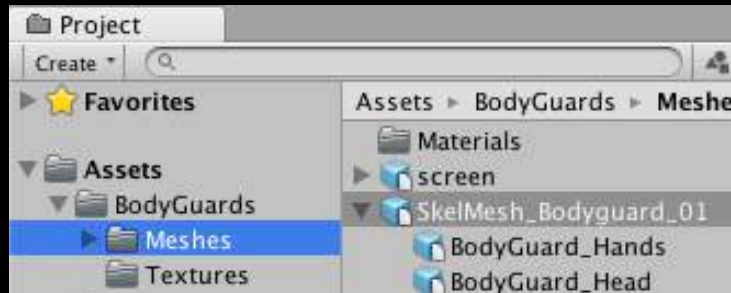


Character Animation Type: Humanoid 🤔



Default animation for the character 🤔

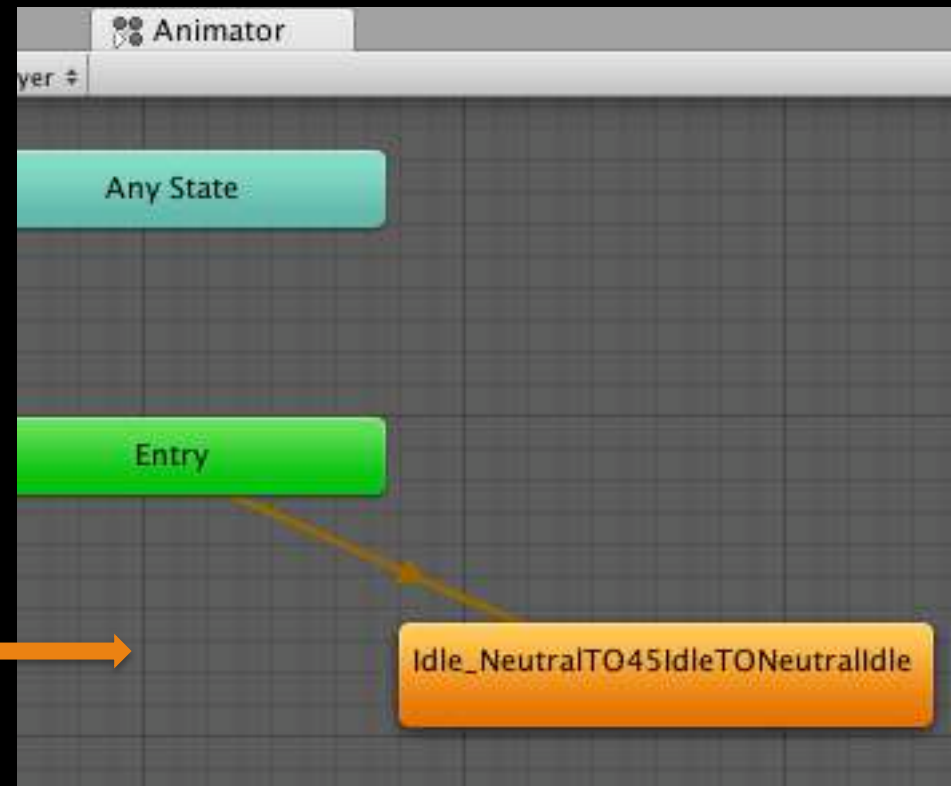
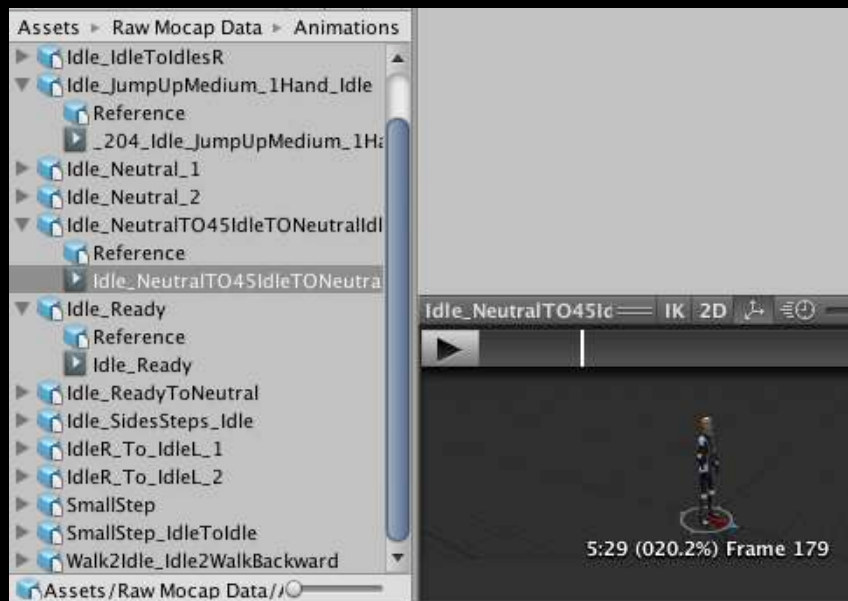
Setting up our 3D model



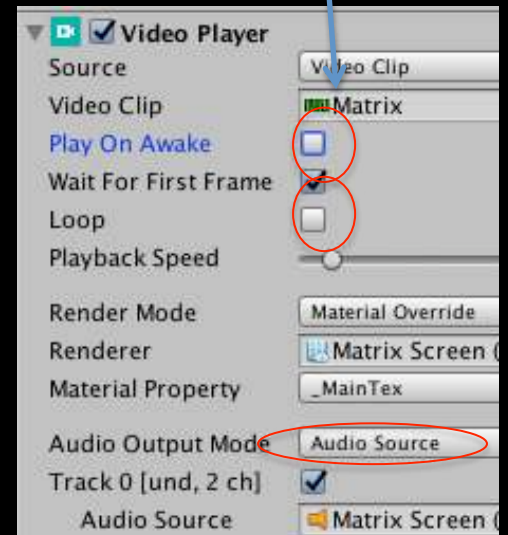
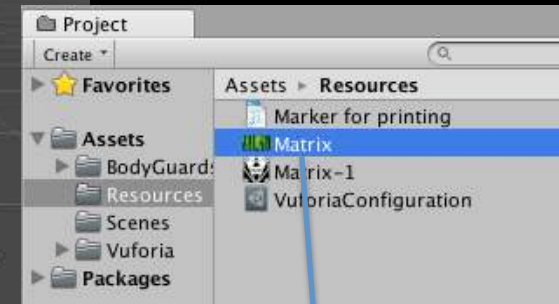
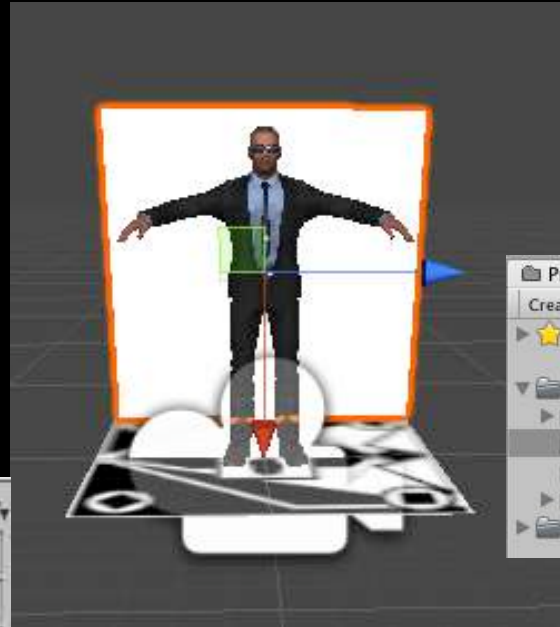
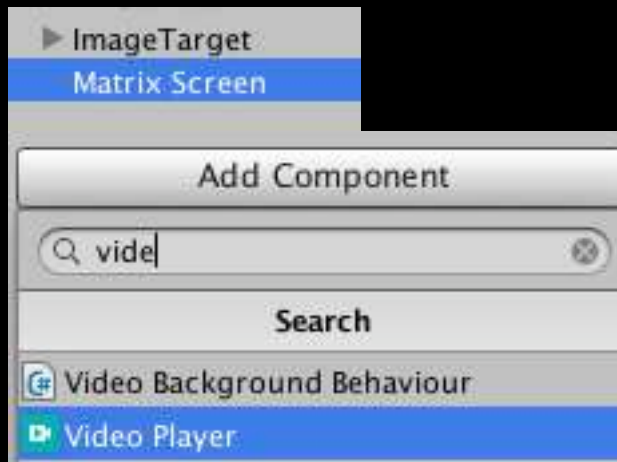
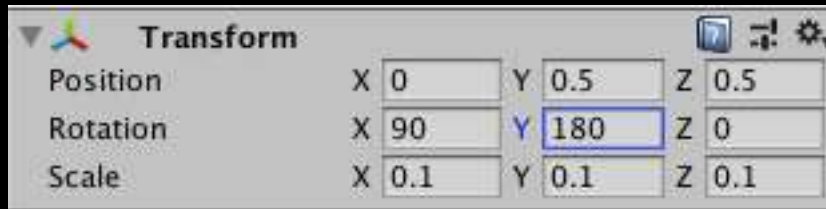
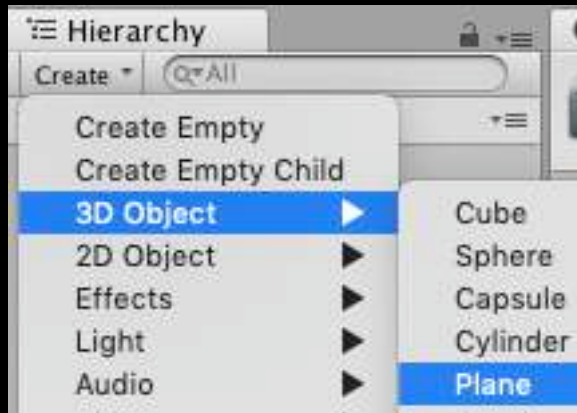
Setting up our animation



Create new Animator Controller for the character and choose animation



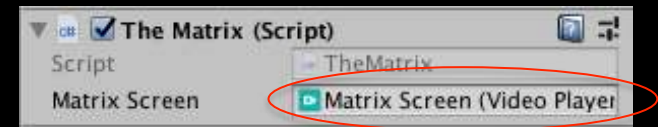
Adding a background Video Player



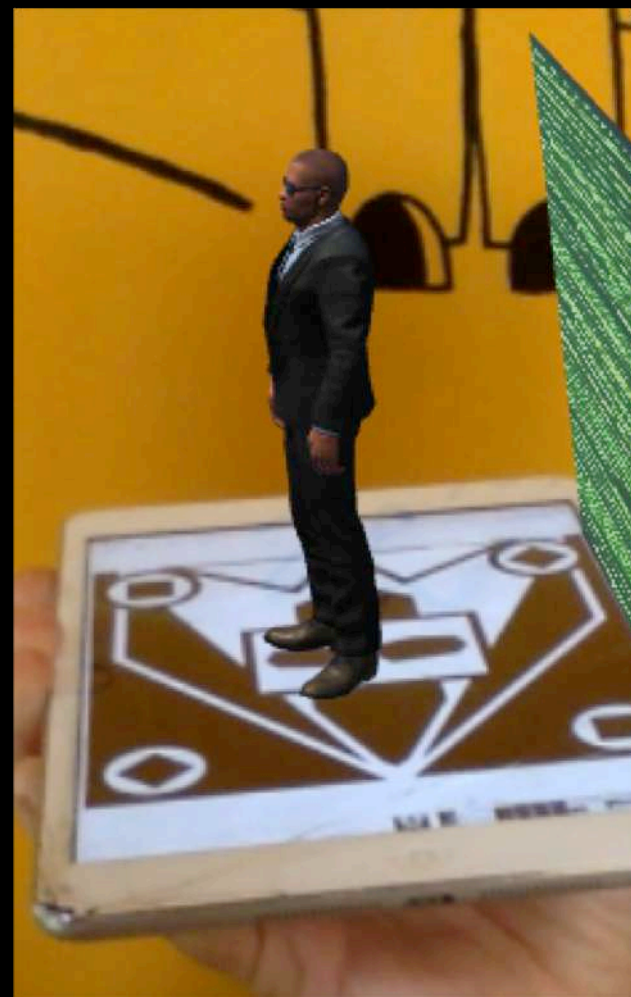
Video plays when target is detected

```
3 using UnityEngine;
4 using Vuforia;
5 using UnityEngine.Video;
6
7 public class TheMatrix : MonoBehaviour, ITrackableEventHandler
8 {
9     protected TrackableBehaviour mTrackableBehaviour;
10    public VideoPlayer matrixScreen;
11
12    void Start () {
13        mTrackableBehaviour = GetComponent<TrackableBehaviour>();
14        if (mTrackableBehaviour)
15            mTrackableBehaviour.RegisterTrackableEventHandler(this);
16    }
17
18    public void OnTrackableStateChanged(
19        TrackableBehaviour.Status previousStatus,
20        TrackableBehaviour.Status newStatus)
21    {
22        if (newStatus == TrackableBehaviour.Status.DETECTED ||
23            newStatus == TrackableBehaviour.Status.TRACKED ||
24            newStatus == TrackableBehaviour.Status.EXTENDED_TRACKED)
25        {
26            // Debug.Log("The Matrix>" + "Target detected");
27            matrixScreen.Play();
28        }
29        else if (previousStatus == TrackableBehaviour.Status.TRACKED &&
30            newStatus == TrackableBehaviour.Status.NO_POSE)
31        {
32            // Debug.Log("The Matrix>" + "Target lost");
33            matrixScreen.Pause();
34        }
35        else
36        {
37            // Debug.Log("The Matrix>" + "Tracking starts");
38            matrixScreen.Stop();
39        }
40    }
41 }
```

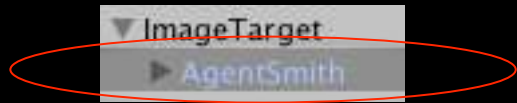
Set Video Screen object on the Event Handler Script



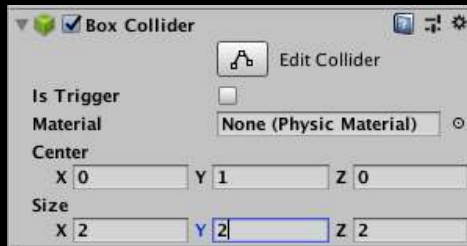
Ta Daaa!



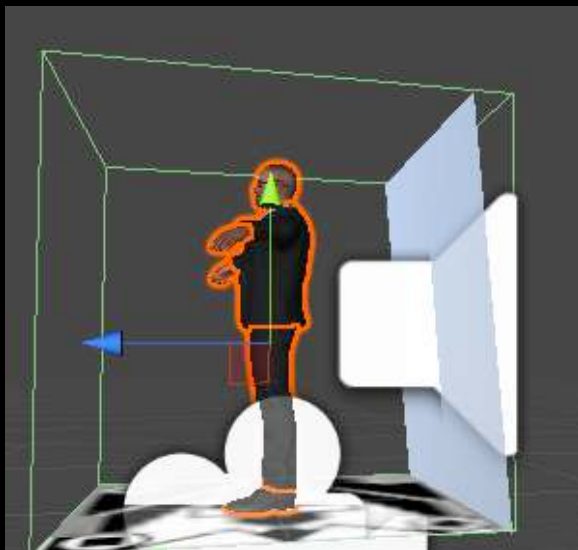
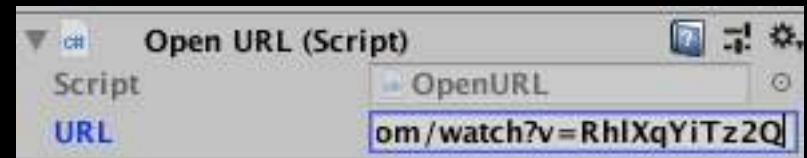
Scene 2: Interacting with the character



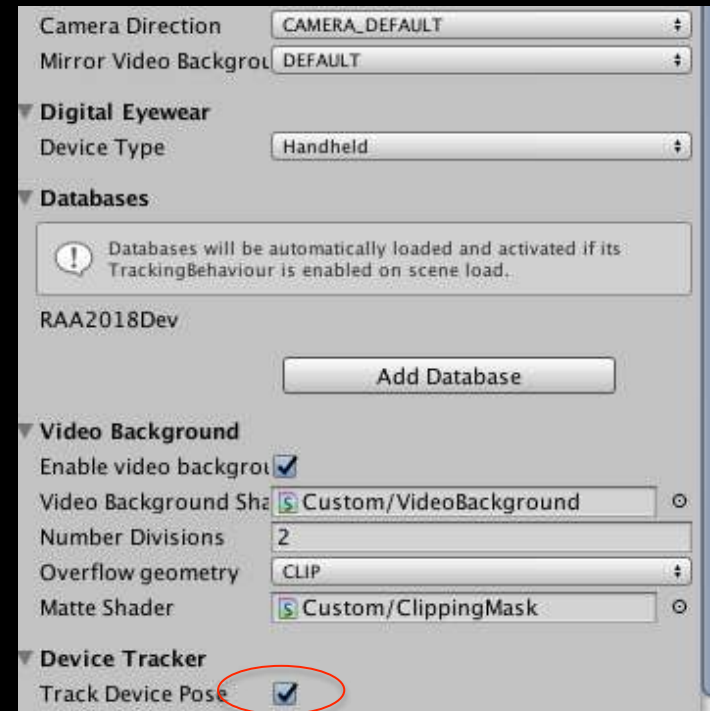
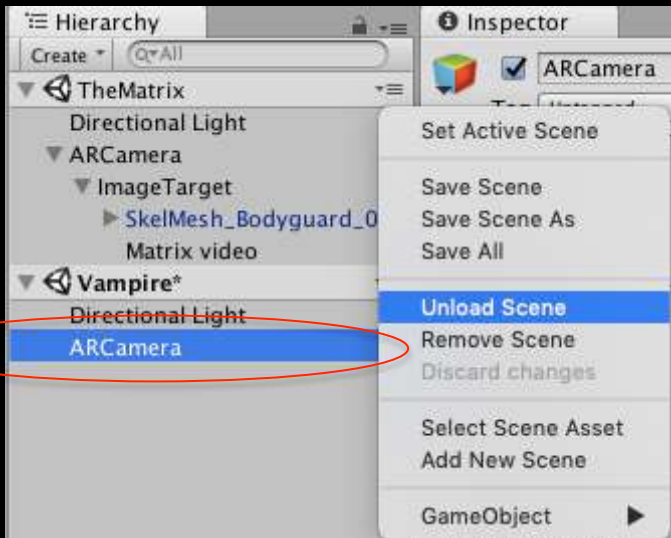
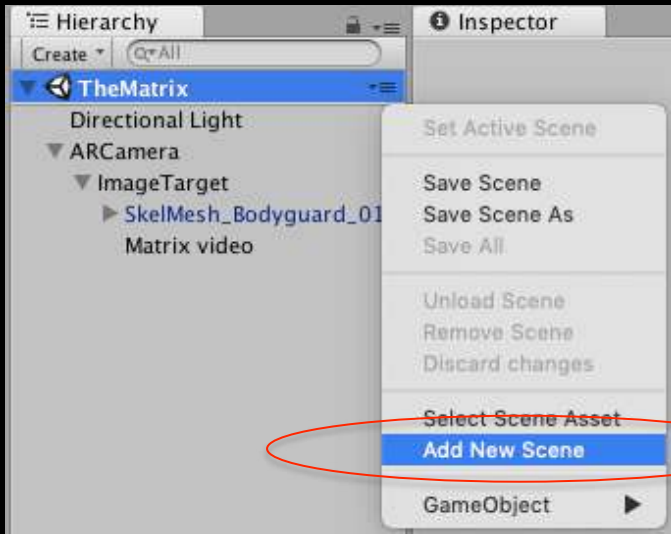
CH OpenURL



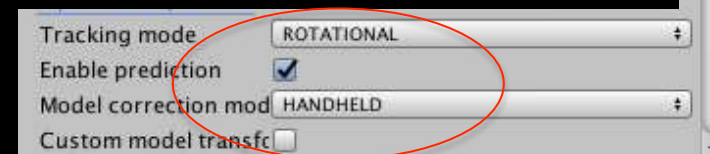
```
5 public class OpenURL : MonoBehaviour {  
6     public string URL;  
7     private void OnMouseDown()  
8     {  
9         Application.OpenURL(URL);  
10    }  
11 }  
12 }  
13 }
```



Scene 2: Position tracking

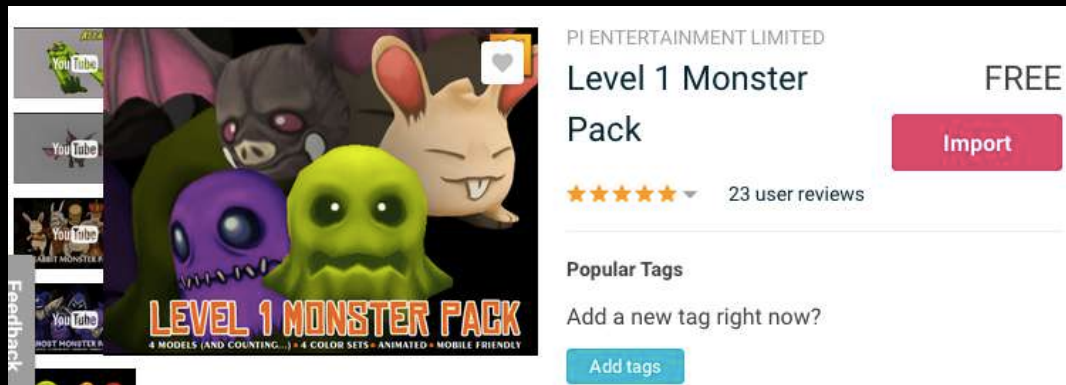
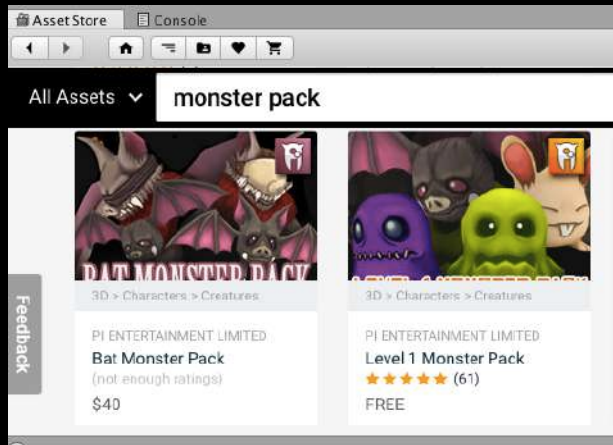


Positional only for latest phones (ARcore/ARkit)
* using the camera to calculate distance
Rotational for older phones using sensors

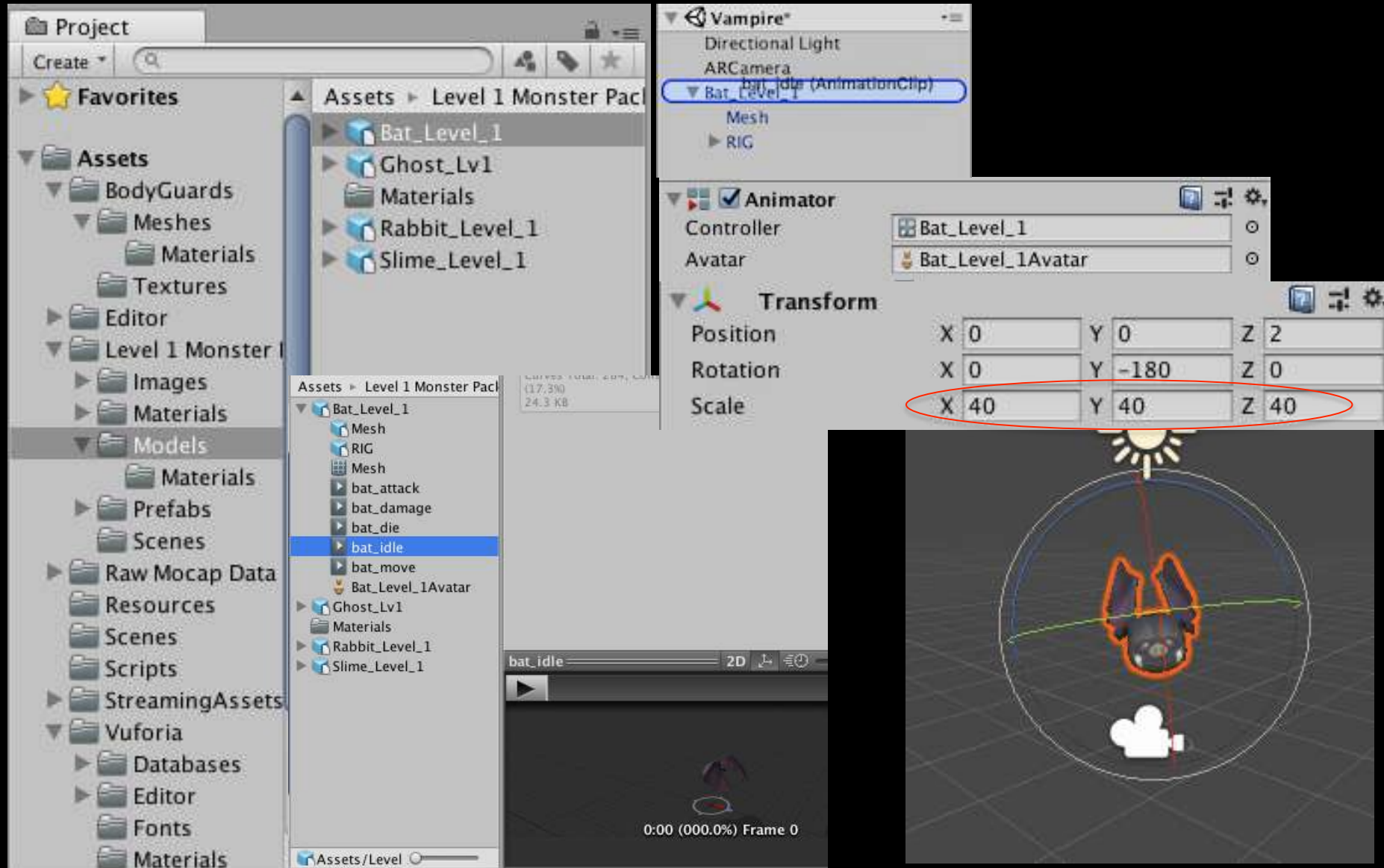


New character: Dracul-bat

(or Cat Bat)



Add character+animation to the scene



Monster Cat Bat



Extract and replace material

Assets > Characters > Monster Cat Bat > Materials

03 - Default MonsterCatBat-... MonsterCatBat-...

MonsterCatBat-... MonsterCatBat-...

Monster Cat Bat Import Settings

Model Rig Animation **Materials**

Import Materials ☒ Use Embedded Materials

Location Use Embedded Materials

Textures Extract Textures...

Materials Extract Materials...

Material assignments can be remapped below.

Remapped Materials

On Demand Remap

03 - Default **MonsterCatBat-Grey**

Revert Apply

Assets > Characters > Monster Cat Bat > FBX

Monster Cat Bat BatRig BatRigPelvis

MonsterBat MonsterBat

Transform

Position	Rotation	Scale
X 0 Y 0 Z 0	X 0 Y 180 Z 0	X 2 Y 2 Z 2

Assets > Characters > Monster Cat Bat > Animations


idle

Monster Cat Bat

Animation ☒ Animation

idle

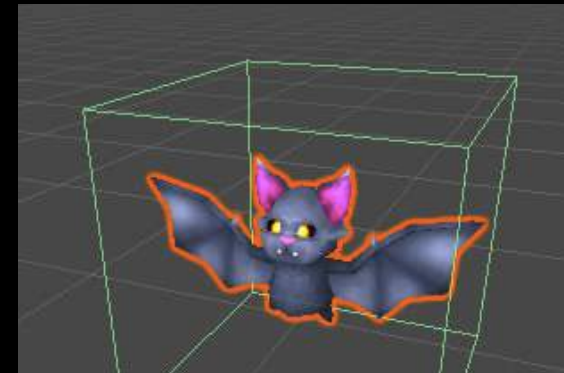
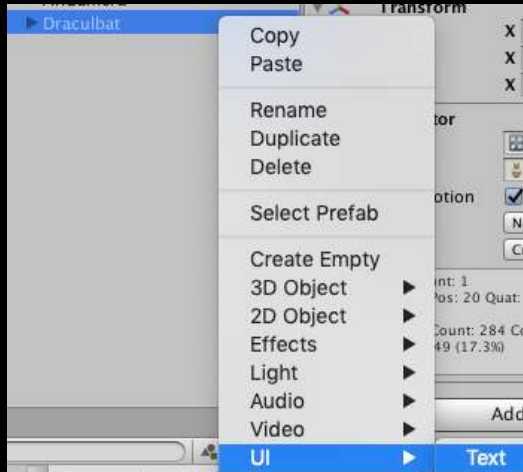
0:02 (008.9%) Frame 2



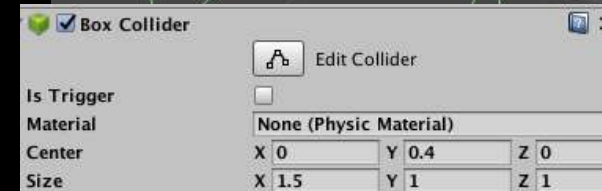
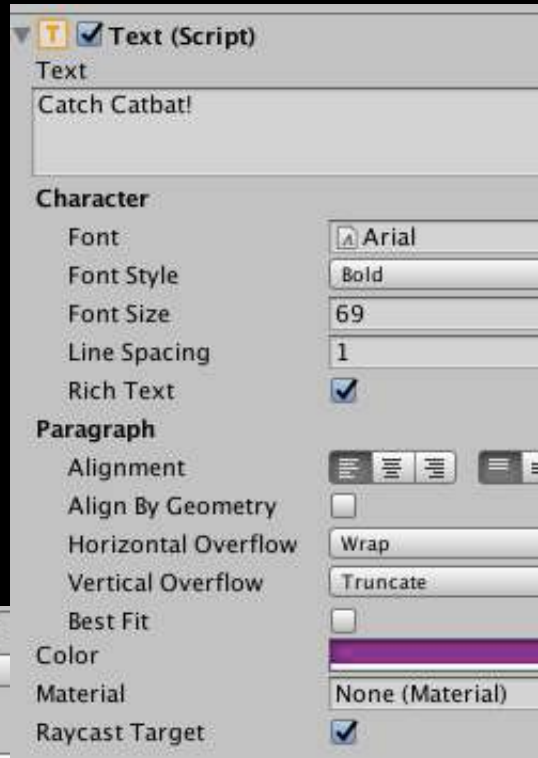
Score + Box Collider

Text: Catch Draculbat / Catbat

Box Collider:



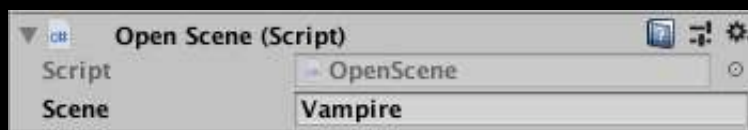
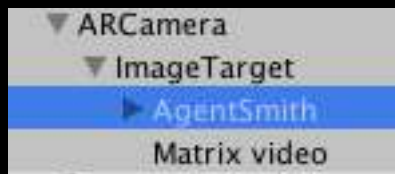
Canvas:



Scripting

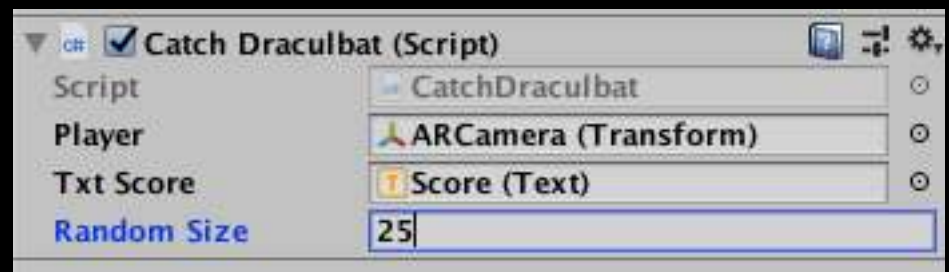
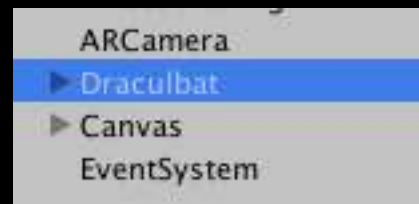
```
OpenScene.cs
OpenScene ▶ OnMouseDown()

1 using System.Collections;
2 using System.Collections.Generic;
3 using UnityEngine;
4 using UnityEngine.SceneManagement;
5
6 public class OpenScene : MonoBehaviour {
7
8     public string scene;
9
10    private void OnMouseDown()
11    {
12        SceneManager.LoadScene(scene);
13    }
14 }
15
```



```
CatchDraculbat.cs
CatchDraculbat ▶ Start()

1 using System.Collections;
2 using System.Collections.Generic;
3 using UnityEngine;
4 using UnityEngine.UI;
5
6 public class CatchDraculbat : MonoBehaviour {
7
8     public Transform player;
9     public Text txtScore;
10    public float randomSize;
11    private int points;
12
13    void Start () {
14        points = 0;
15        changePosition();
16        txtScore.text = "Catch Draculbat!!";
17    }
18
19    private void OnMouseDown(){
20        addScore();
21        changePosition();
22    }
23
24    void addScore () {
25        points++;
26        txtScore.text = "Score: " + points.ToString();
27    }
28
29    void changePosition () {
30        transform.position = new Vector3(Random.insideUnitSphere.x * randomSize, transform.position.y, (Random.insideUnitSphere.z * randomSize));
31        Vector3 playerPosition = new Vector3(player.position.x, transform.position.y, player.position.z);
32        transform.LookAt(playerPosition);
33    }
34 }
35
```



Build Android App



Unity File Edit

About Unity...

Preferences...

Unity Preferences

External Tools

General

External Script Editor Visual Studio

Add .unityproj's to .sln

Editor Attaching ☒

External Tools

Colors

Image application Open by file extension

Keys

Revision Control Diff/Merge Apple File Merge

GI Cache

Android

2D

JDK

Cache Server

NDK

SDK Browse Download

JDK Browse Download

NDK Browse Download



Android SDK detected

Unity has detected Android SDK at '/Users/Victor/Library/Android/sdk'.

Do you want to use this SDK directory?

No

Yes

File Edit Assets Game

New Scene ⌘N

Open Scene... ⌘O

Save Scenes ⌘S

Save Scene as... ⇧⌘S

New Project...

Open Project...

Save Project

Build Settings... ⇧⌘B

Build & Run ⌘B

Settings for Android

Icon

Resolution and Presentation

Splash Image

Other Settings

Rendering

Color Space* Gamma

Auto Graphics API ☒

Multithreaded Rendering* ☒

Static Batching ☒

Dynamic Batching ☐

GPU Skinning* ☒

Graphics Jobs (Experimental) ☐

Lightmap Streaming Enabled ☒

Streaming Priority 0

[Virtual Reality moved to XR Settings](#)

Protect Graphics Memory ☐

Vulkan Settings

Enable SetSRGBWrite()* ☐

Use SW Commandbuffers* ☐

Identification

Package Name com.Company.ProductName

Version* 0.1

Bundle Version Code 1

[Minimum API Level](#)

Target API Level ☒ Android 4.1 'Jelly Bean' (API level 16)

Android 4.2 'Jelly Bean' (API level 17)

Android 4.3 'Jelly Bean' (API level 18)

Android 4.4 'Kit Kat' (API level 19)

Android 5.0 'Lollipop' (API level 21)

Configuration

Scripting Runtime Version*

Save Project

Build Settings... ⇧⌘B

Build & Run ⌘B

Android

SDK /Users/Victor/Library/Android/sdk

JDK /Library/Java/JavaVirtualMachines/jdk1.8.0

Vampire

Set Active Scene

Save Scene

Save Scene As

Save All

Unload Scene

Scenes to Build

☒ Scenes/Textures

☒ Scenes/Models

☒ Scenes/Animations

☒ Scenes/Audio

☒ Scenes/Video

☒ Scenes/Settings

☒ Scenes/Scripts

☒ Scenes/Builds

☒ Scenes/Builds

☒ Scenes/Builds

☒ Scenes/Builds

☒ Scenes/Builds

☒ Scenes/Builds

☒ Scenes/Builds

☒ Scenes/Builds

☒ Scenes/Builds

☒ Scenes/Builds

☒ Scenes/Builds

☒ Scenes/Builds

☒ Scenes/Builds

☒ Scenes/Builds

☒ Scenes/Builds

☒ Scenes/Builds

☒ Scenes/Builds

☒ Scenes/Builds

☒ Scenes/Builds

☒ Scenes/Builds

☒ Scenes/Builds

☒ Scenes/Builds

☒ Scenes/Builds

☒ Scenes/Builds

☒ Scenes/Builds

☒ Scenes/Builds

☒ Scenes/Builds

☒ Scenes/Builds

☒ Scenes/Builds

☒ Scenes/Builds

☒ Scenes/Builds

☒ Scenes/Builds

☒ Scenes/Builds

☒ Scenes/Builds

☒ Scenes/Builds

☒ Scenes/Builds

☒ Scenes/Builds

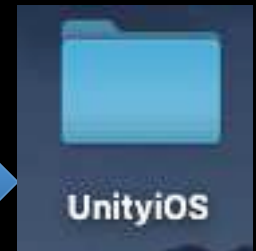
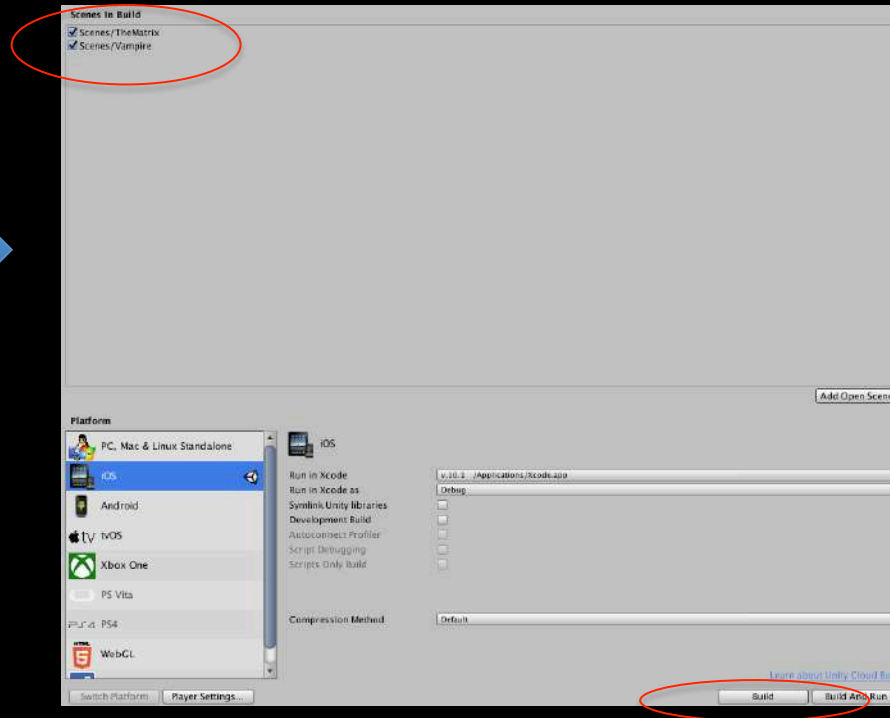
☒ Scenes/Builds

☒ Scenes/Builds

☒ Scenes/Builds

☒ Scenes/Builds

Build iOS App



Open this folder with Xcode

Enjoy! Mwah ha ha!

