

Unity + Vuforia

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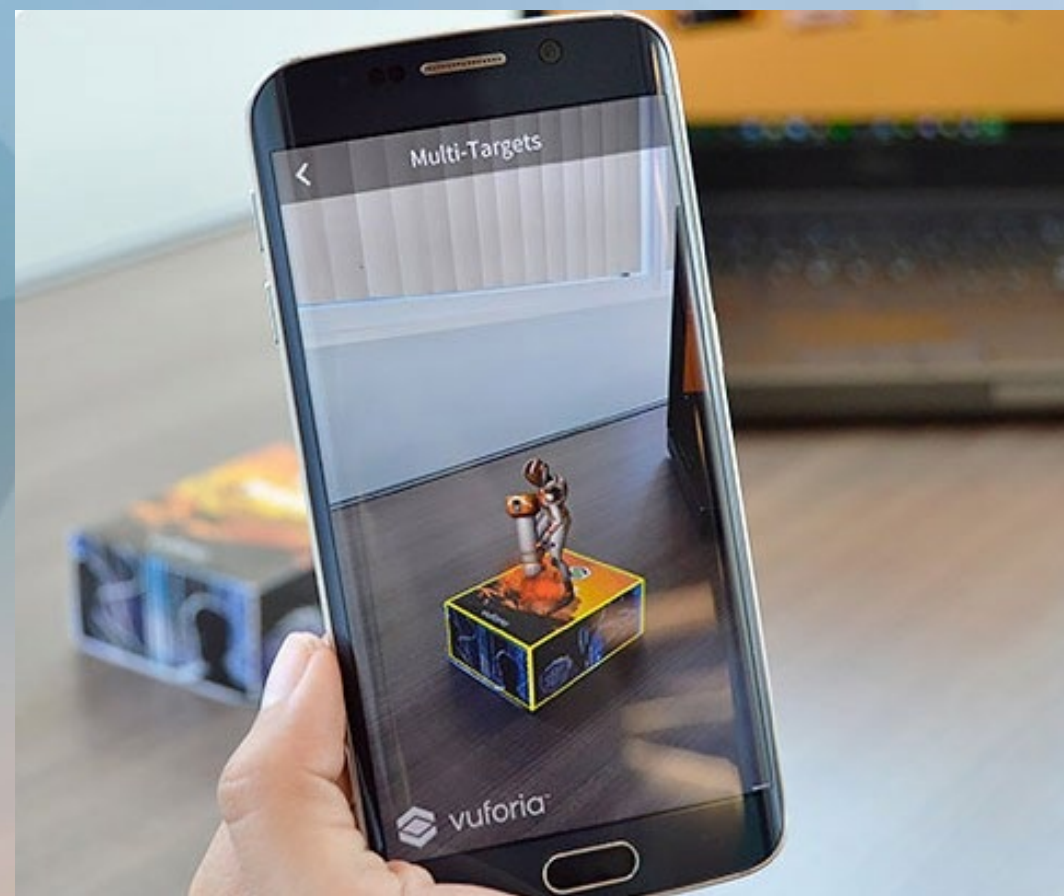
AR介紹

AR

AR為Augmented Reality(擴增實境)的簡稱，透過照相鏡頭和APP將真實世界和虛擬物件連接在一起結合了影像辨識和即時算圖達到即時互動的效果，AR目前運用廣泛在遊戲娛樂、教學和應用程式上。



Vuforia介紹



Vuforia介紹

Vuforia

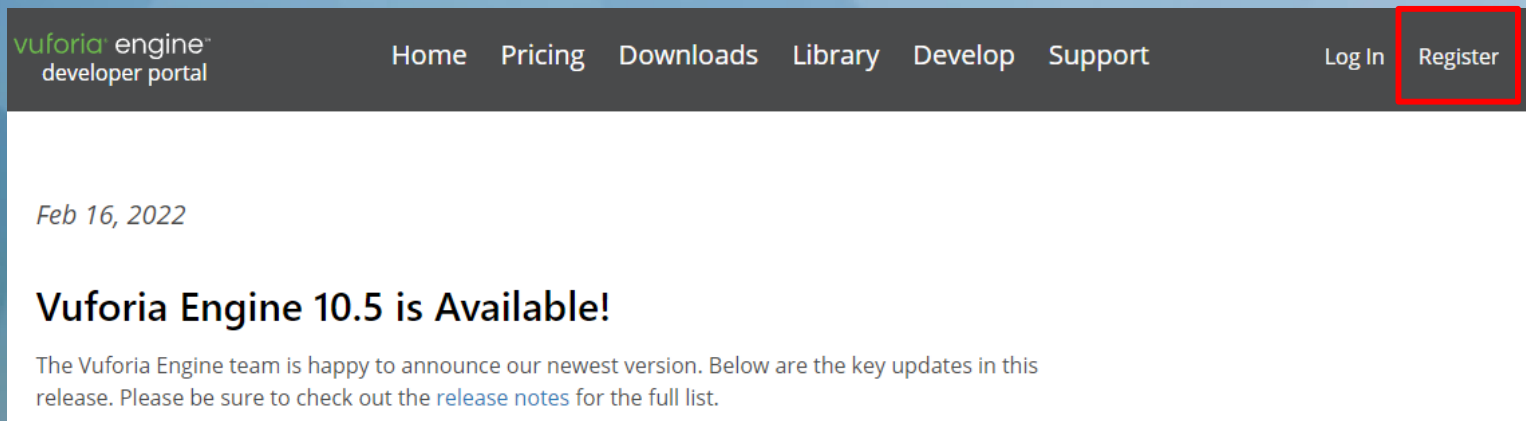
Vuforia 是行動裝置處理器大廠 Qualcomm 高通公司的 AR 擴增實境開發平台，提供行動裝置的 SDK 軟體開發套件與 Unity 遊戲引擎的模組，以往 AR 開發工具 如ARToolKit、Unifeye 等軟體的授權價格非常昂貴，而 Vuforia 免費使用。

AR開發工具比較

	Vuforia	EasyAR	AR Foundation
功能	多	少	多
費用	free	free	free
網路學習資源	多	中	少

Vuforia安裝&註冊

進入Vuforia官網註冊帳號



vuforia engine[™]
developer portal

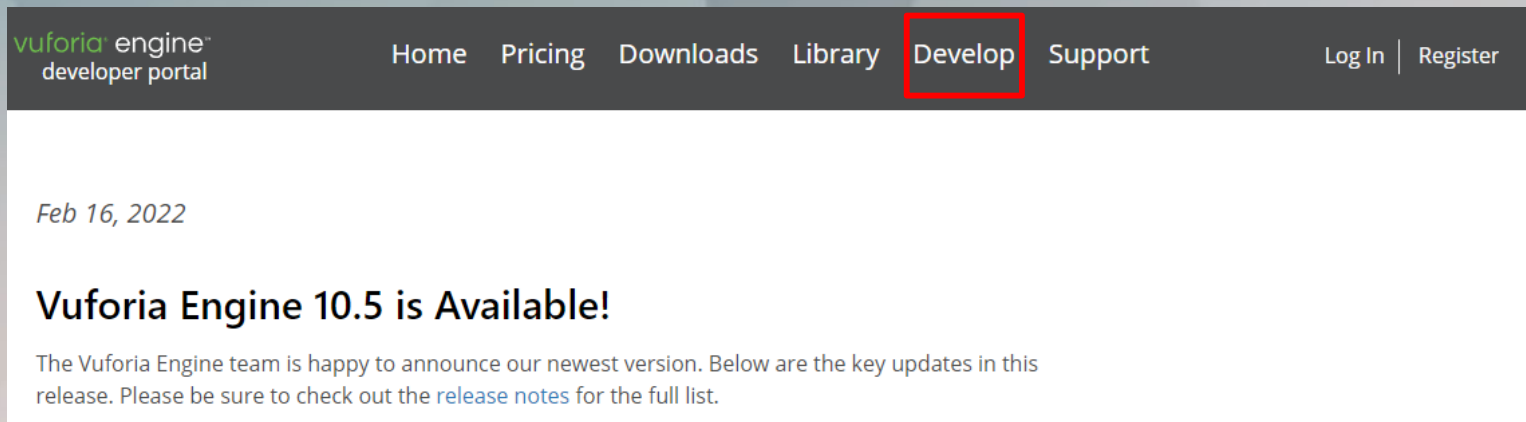
Home Pricing Downloads Library Develop Support Log In **Register**

Feb 16, 2022

Vuforia Engine 10.5 is Available!

The Vuforia Engine team is happy to announce our newest version. Below are the key updates in this release. Please be sure to check out the [release notes](#) for the full list.

建立好帳號，點選Develop



vuforia engine[™]
developer portal

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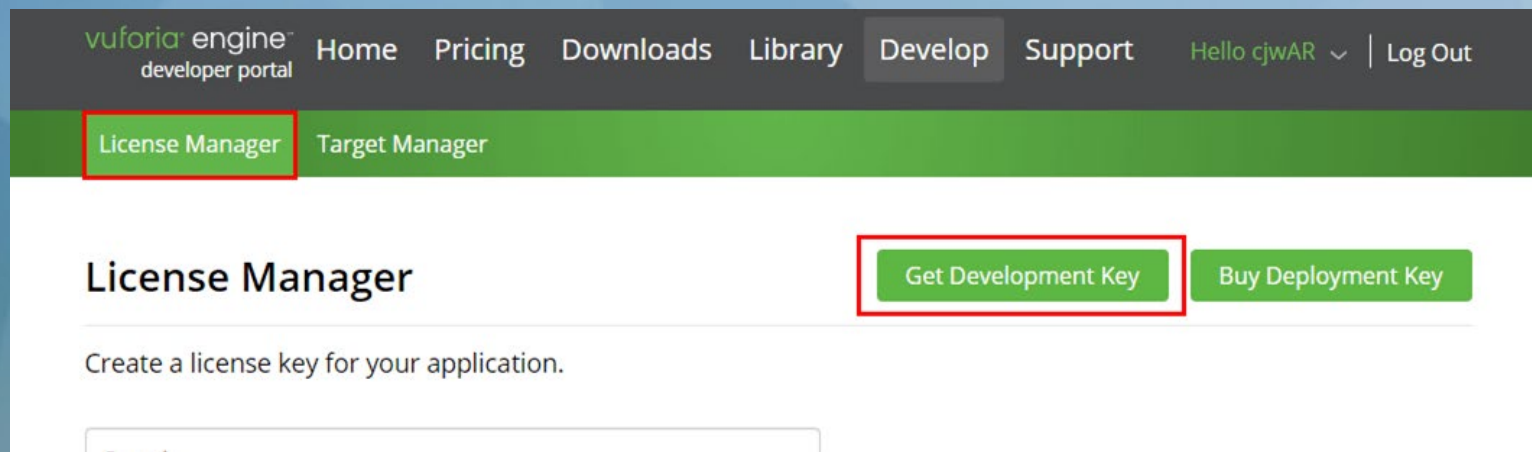
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Vuforia Engine 10.5 is Available!

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Vuforia安裝&註冊

取得 License



vuforia engine™ developer portal Home Pricing Downloads Library Develop Support Hello cjwAR | Log Out

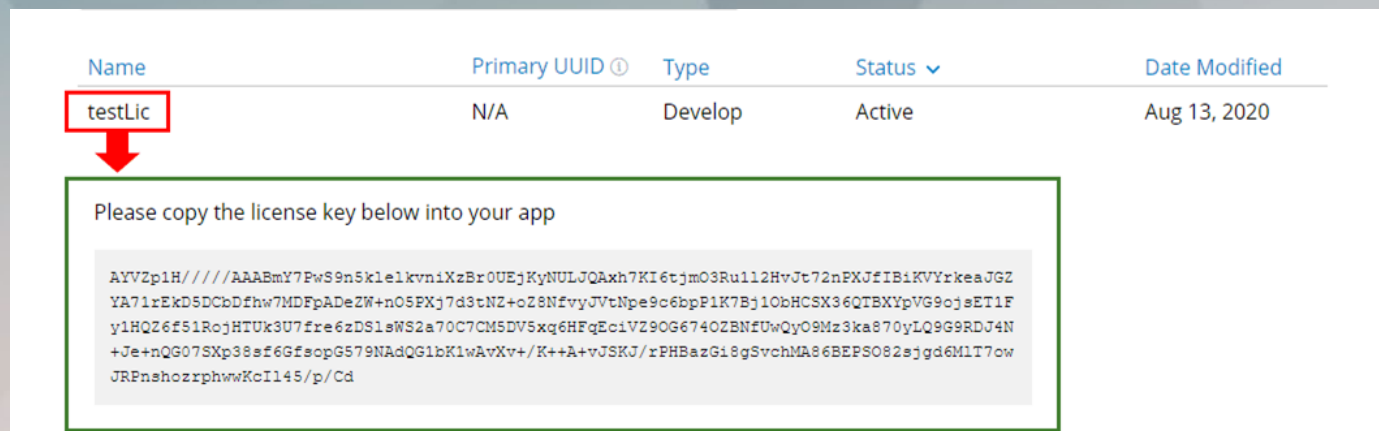
License Manager Target Manager

License Manager

[Get Development Key](#) [Buy Deployment Key](#)

Create a license key for your application.

建立完成後點擊 license 名稱(如下圖的 testLic)，即可看到用來開發 app 的 license key。



Name	Primary UUID ⓘ	Type	Status ▾	Date Modified
testLic	N/A	Develop	Active	Aug 13, 2020

Please copy the license key below into your app

```
AYVZp1H/////AAABmY7FwS9n5k1e1kvniXzBr0UEjKyNULJQAxh7KI6tjm03Ru112HvJt72nPXJfIBiKVYrkeaJGZ  
YA71zEkD5DCbDfhw7MDFpADeZW+n05PXj7d9tNZ+oZ8NfvyJVtNpe9o6bpP1K7Bj10bHCSX36QTBXYpVG9ojsET1F  
y1HQZ6f51RojHTUk3U7fre6zDS1sWS2a70C7CMSDV5xq6HFqEciVZ9OG674OZBNfUwQyO9Mz3ka870yLQ9G9RDJ4N  
+Je+nQG07SXp38sf6GfsopG579NAdQG1bK1wAvXv+/K++A+vJSKJ/rPHBazG18gSvchMA86BEPS082ejgd6MLT7ow  
JRPnshozrphwwKcI145/p/Cd
```

Vuforia安裝&註冊

製作辨識圖

找一張自己喜歡的圖，並後製一下



Vuforia安裝&註冊

上傳辨識圖

點選Target Manager 然後點擊 Add Database 新增一個資料夾，用來存放上傳的辨識圖片。

vuforia engine[™]
developer portal

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License Manager Target Manager

Target Manager

Add Database

Use the Target Manager to create and manage databases and targets.

Search

Database	Type	Targets	Date Modified
----------	------	---------	---------------

Create Database

Database Name *
myTest

Type:

Device

Cloud

VuMark

Cancel Create

Vuforia安裝&註冊

上傳圖片

點擊資料夾名稱進入 Database，然後點擊 Add Target 即可選擇欲上傳做為辨識目標的影像。

Target Manager > myTest


myTest [Edit Name](#)
Type: Device

Targets (0)

Add Target [Download Database \(All\)](#)

<input type="checkbox"/> Target Name	Type	Rating ⓘ	Status ▾	Date Modified
--------------------------------------	------	----------	----------	---------------

Add Target [Download Database \(All\)](#)

<input type="checkbox"/> Target Name	Type	Rating ⓘ	Status ▾	Date Modified
<input type="checkbox"/>  IMAG2278	Single Image	★★★★★	Active	Aug 13, 2020 21:30

上傳的圖檔必須為 jpg 或 png 格式，且不能超過 2MB
若圖片太大，可使用 [線上縮小圖片工具](#) 進行調整
Width部分統一輸入1

Add Target

Type:

Single Image Cuboid Cylinder 3D Object

File:

[Browse...](#)

.jpg or .png (max file 2mb)

Width:

Enter the width of your target in scene units. The size of the target should be on the same scale as your augmented virtual content. Vuforia uses meters as the default unit scale. The target's height will be calculated when you upload your image.

Name:

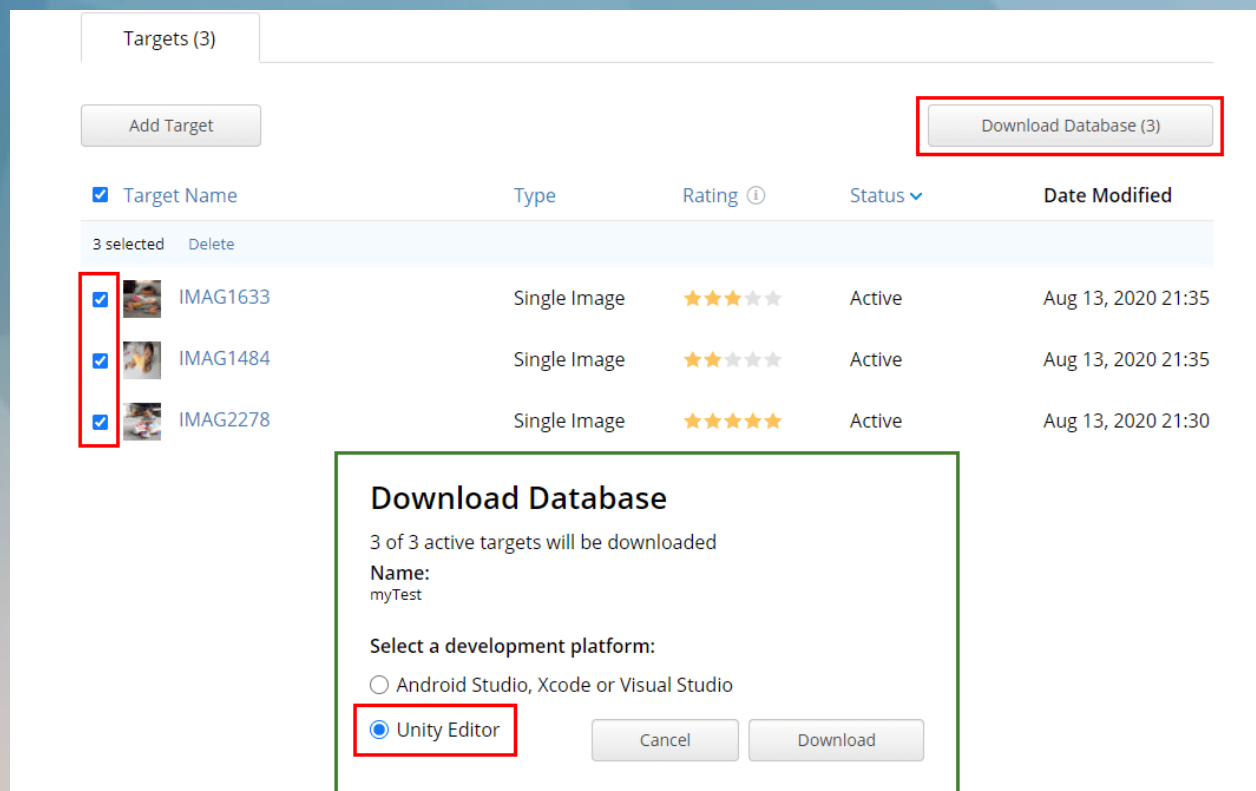
Name must be unique to a database. When a target is detected in your application, this will be reported in the API.

[Cancel](#) [Add](#)

Vuforia安裝&註冊

下載DataBase

將圖全部上傳，然後到 Database 勾選要使用的影像辨識資料，再點擊 Download Database 然後選擇 Unity Editor，即可把辨識資料打包成 unitypackage 檔下載回來匯入 unity。



The screenshot shows the Vuforia Database interface. At the top, there is a 'Targets (3)' header and an 'Add Target' button. A 'Download Database (3)' button is highlighted with a red box. Below this is a table of targets with columns for Target Name, Type, Rating, Status, and Date Modified. Three targets are listed, each with a checked checkbox in the first column, which are also highlighted with a red box. A 'Download Database' dialog box is open at the bottom, showing '3 of 3 active targets will be downloaded' and 'Name: myTest'. Under 'Select a development platform:', the 'Unity Editor' radio button is selected and highlighted with a red box. 'Cancel' and 'Download' buttons are also visible.

<input checked="" type="checkbox"/>	Target Name	Type	Rating ①	Status ▾	Date Modified
<input checked="" type="checkbox"/>	IMAG1633	Single Image	★★★★☆	Active	Aug 13, 2020 21:35
<input checked="" type="checkbox"/>	IMAG1484	Single Image	★★★★☆	Active	Aug 13, 2020 21:35
<input checked="" type="checkbox"/>	IMAG2278	Single Image	★★★★★	Active	Aug 13, 2020 21:30

Download Database

3 of 3 active targets will be downloaded

Name:
myTest

Select a development platform:

Android Studio, Xcode or Visual Studio

Unity Editor

Cancel Download

Unity環境架設

於Unity安裝Vuforia

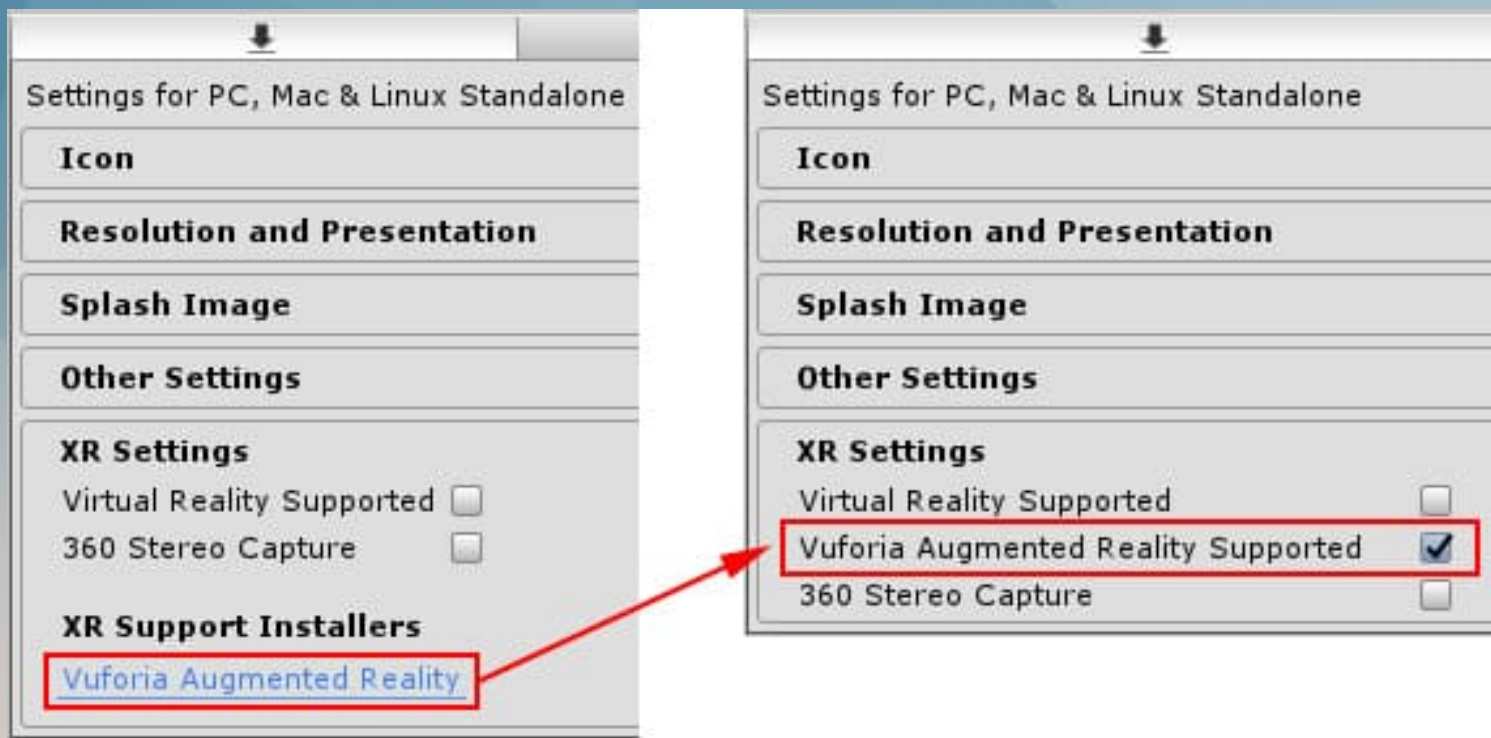
Window > Package Manager 透過搜尋找到 Vuforia Engine(記得把 Packages 切換為 My Assets), 接著點擊 Import 進行匯入。完成後即可從 Unity Editor 介面選單操作 vuforia 相關功能來開發 AR 內容。



Unity環境架設

若使用Unity 2019.2.x 以前的版本，安裝時遇到問題

File > Build Settings 點擊 Player Setting，勾選 XR Settings 項目中的 Vuforia Augmented Reality Support (如右下圖)即可，此時 Project 中會產生一個 Resources 資料夾。若沒看到該選項，請點擊 XR Support Installers 中的超連結(如左下圖)下載，然後關掉 unity 進行安裝。



新版本的安裝 Unity 2020 下載與安裝

The screenshot shows the Vuforia Developer Portal website. The browser address bar displays `developer.vuforia.com/downloads/sdk`. The page features a navigation menu with 'SDK', 'Samples', and 'Tools' highlighted. A 'Release Version' dropdown menu is set to '10.7', with an 'Apply' button next to it. Below this, the heading 'Vuforia Engine 10.7' is displayed. A paragraph explains that Vuforia Engine can be used to build AR applications for mobile devices and AR glasses, and can be imported into Unity by downloading and double-clicking the .unitypackage file. A red box highlights the Unity package download option: 'Add Vuforia Engine to a Unity Project or upgrade to the latest version' (222.89 MB). Other download options for Android, iOS, and UWP are listed below.

SDK Download | Vuforia Develc x Vuforia 教學 unity AR 設定流程(x AQtaiX/////AAABmeYbEJl4bE x +

developer.vuforia.com/downloads/sdk

Prof. Chih-Hung... Google 地圖 Google 大數據實務課程 - G... AR - Google 雲端... SSCI期刊查詢

vuforia engine™ developer portal Home Pricing Downloads Library Develop Support


SDK Samples Tools


Release Version

10.7 Apply


Vuforia Engine 10.7

Use Vuforia Engine to build Augmented Reality Android, iOS, and UWP applications for mobile devices and AR glasses. Apps can be built with Unity, Android Studio, Xcode, and Visual Studio. Vuforia Engine can be easily imported into Unity by downloading and double-clicking the .unitypackage below.

 [Add Vuforia Engine to a Unity Project or upgrade to the latest version](#)
add-vuforia-package-10-7-2.unitypackage (222.89 MB)
MD5: 230a82b6e73b6d9318c8434a7e0d3edb

 [Download for Android](#)
vuforia-sdk-android-10-7-2.zip (30.28 MB)
MD5: 140a414ebdc40c383993292824d9cf40

iOS [Download for iOS](#)
vuforia-sdk-ios-10-7-2.zip (96.88 MB)
MD5: 9bd2000cfc174cc282b34661b2b55c3a

 [Download for UWP](#)
vuforia-sdk-uwp-10-7-2.zip (25.97 MB)

My project (5) - Haruko - PC, Mac & Linux Standalone - Unity 2020.3.29f1 Personal <DX11>

File Edit Assets GameObject Component Window Help



Hierarchy

All

- Haruko
 - Main Camera
 - Directional Light
 - Ground
 - Haruko
 - Haruko (1)
 - Haruko (2)
 - Haruko (3)
 - Haruko (4)

- Panels >
- Next Window Ctrl+Tab
- Previous Window Ctrl+Shift+Tab
- Layouts >
- Collaborate
- Plastic SCM
- Vuforia Configuration Ctrl+Shift+V**
- Asset Store
- Package Manager
- Asset Management >
- TextMeshPro >
- General >
- Rendering >
- Animation >
- Audio >
- Sequencing >
- Analysis >
- AI >
- UI Toolkit >



Game Asset Store
QHD (2560x1440) Scale 0.46x Maximize On Play Mute Audio Stats Gizmos



Project Console

輸入API License Key

從Vuforia網站 Develop->License Key
Copy->Paste

License Key

Name	Primary UUID ^①	Type	Status [▼]	Date Modified
testLic	N/A	Develop	Active	Aug 13, 2020

Please copy the license key below into your app

```
AYVZp1H/////AAABmY7PwS9n5k1e1kvn1XzBr0UEjKyNULJQAxh7KI6tjmO3Ru112HvJt72nFXJfIB1KVYrkeaJGZ  
YA71rEkD5DChDfhw7MDFpADeZW+nO5EXj7d3tNZ+oZ8NfvyJVtNpe9c6bpF1K7Bj10bHCSX36QTBXYpVG99oj9ET1F  
y1HQZ6f51RojHTUk3U7fre6zDS1sWS2a70C7CM5DV5xq6HFqEciVZ9OG674OZBNfUwQyO9Mz3ka870yLQ9G9RDJ4N  
+Je+nQG07SXP38sf6GfscopG579NAdQG1bK1wAvXv+/K++A+vJSKJ/rPHBazG18gSvchMA86BEP8082s3gd6MLT7ow  
JRPnshozrphwKcI145/p/Cd
```

Inspector Navigation
Vuforia Configuration (Vuforia Configuration) Open

Global
Vuforia Version 10.7.2

We strongly recommend developers to encrypt their key for enhanced security. For more information refer to the article below.
[Open Library Article](#)
App License Key

```
AQtauIX/////AAABmeYbEJl4bEBsuDifM0dNWu96UJVGZYmQr1  
bNBXfCPdE76KKW3zIkkplgDP0Q2CbkM9bTDd8d6Oxs3BE0j  
a3wt64v2BQonXbOM0VQOM806nUqfYIz/Lp/H+Q6E4hDwP0  
MaRoKkmNRSaAvhxP8VYvZfm900mV9b06JPg+pyh8vSQ+h  
7rYZ/vQCRbLXh9FM+fG7n7PaEuNF3q38tMpQgea1ES9kRm  
a5PN7jiXP5C1wJHfXZUESky1V0ws+7LatYKtb8wjBCQbiMA  
+ik1DUoYA7nsVIRu1FqXI53EliTzomZJwPUocDI6VhxLjNfLs  
O+SxK+o2CurFoNg4fj4kqtqkqAvGU3pHpaBscay710kTBsDa
```

Add License

Delayed Initialization

Camera Focus Mode CONTINUOUS AUTOFOCUS

Additional Focus modes can be set using the CameraDevice.SetFocusMode() API, but are not supported on all platforms.

Camera Device Mode MODE_DEFAULT

Max Simultaneous Tracked Images 1

Virtual Scene Scale Factor 1

The factor above configures how many Unity scene units correspond to one meter in the physical world. Poses reported by Vuforia will be transformed accordingly. Scene content will not be scaled. Note that on HoloLens and MagicLeap, a factor other than 1.0 is not supported.

Trained Targets Continuous Search

Share Recordings in iTunes

Databases

Databases will be automatically loaded and activated if its TrackingBehaviour is enabled on scene load.

ARtest0514

Add Database

Disable model extraction from databases

Video Background

Enable video background

Video Background Shader Custom/VideoBackground

Number Divisions 2

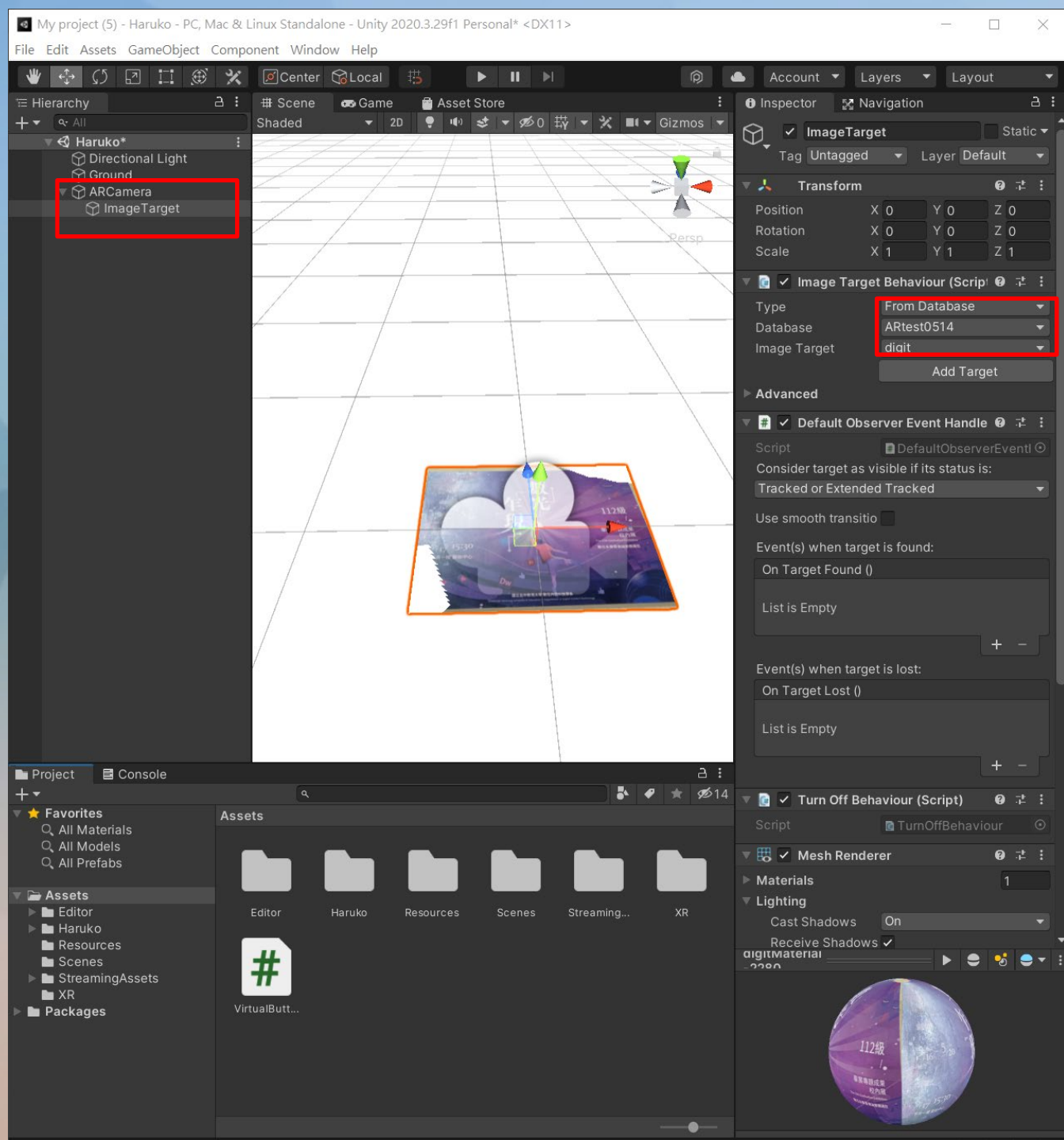
Asset Labels

AssetBundle None None

建立AR環境

Create->Vuforia->AR Camera
刪除原本的camera

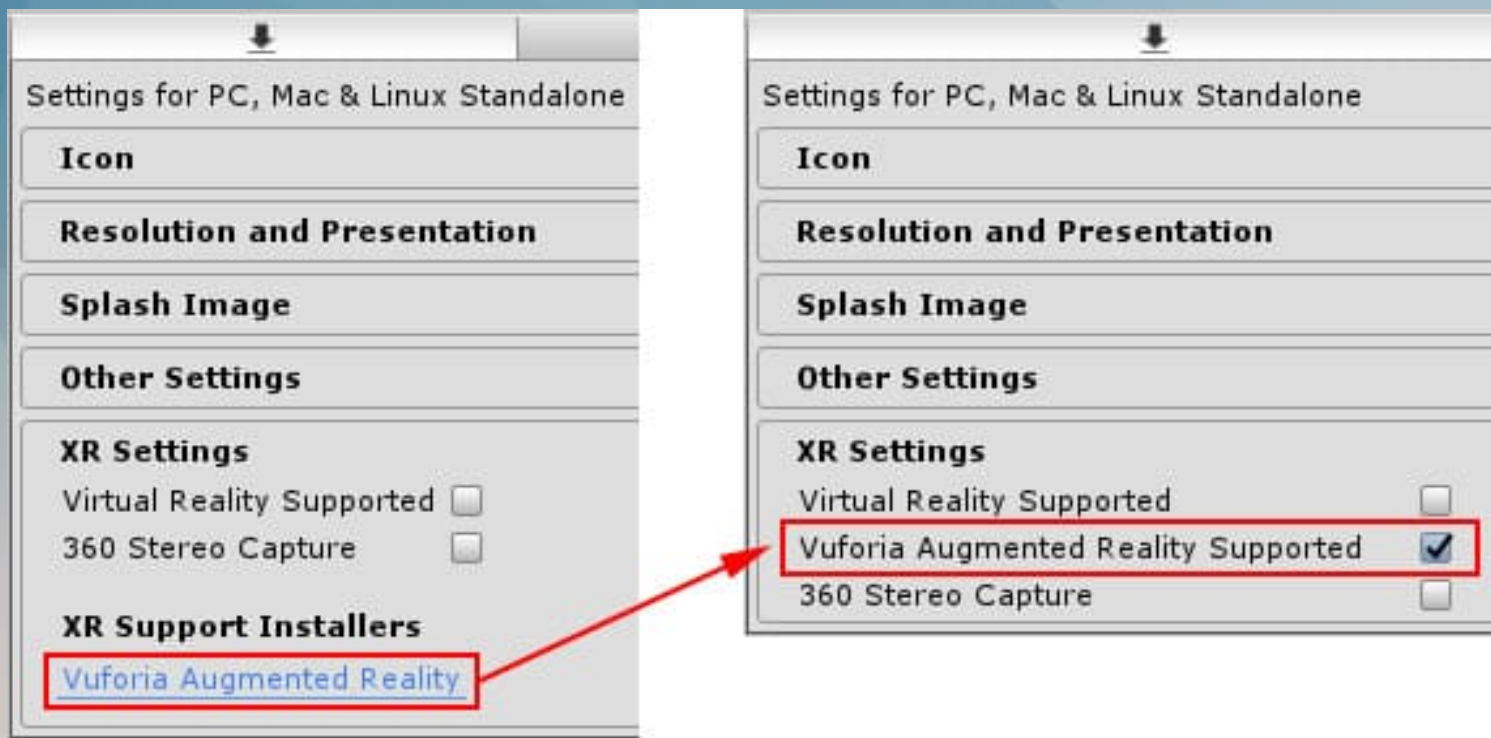
Create->Vuforia->Image Target
點選Image Target->設定database
(Database需先從Vuforia下載)



Unity環境架設

若使用Unity 2019.2.x 以前的版本，安裝時遇到問題

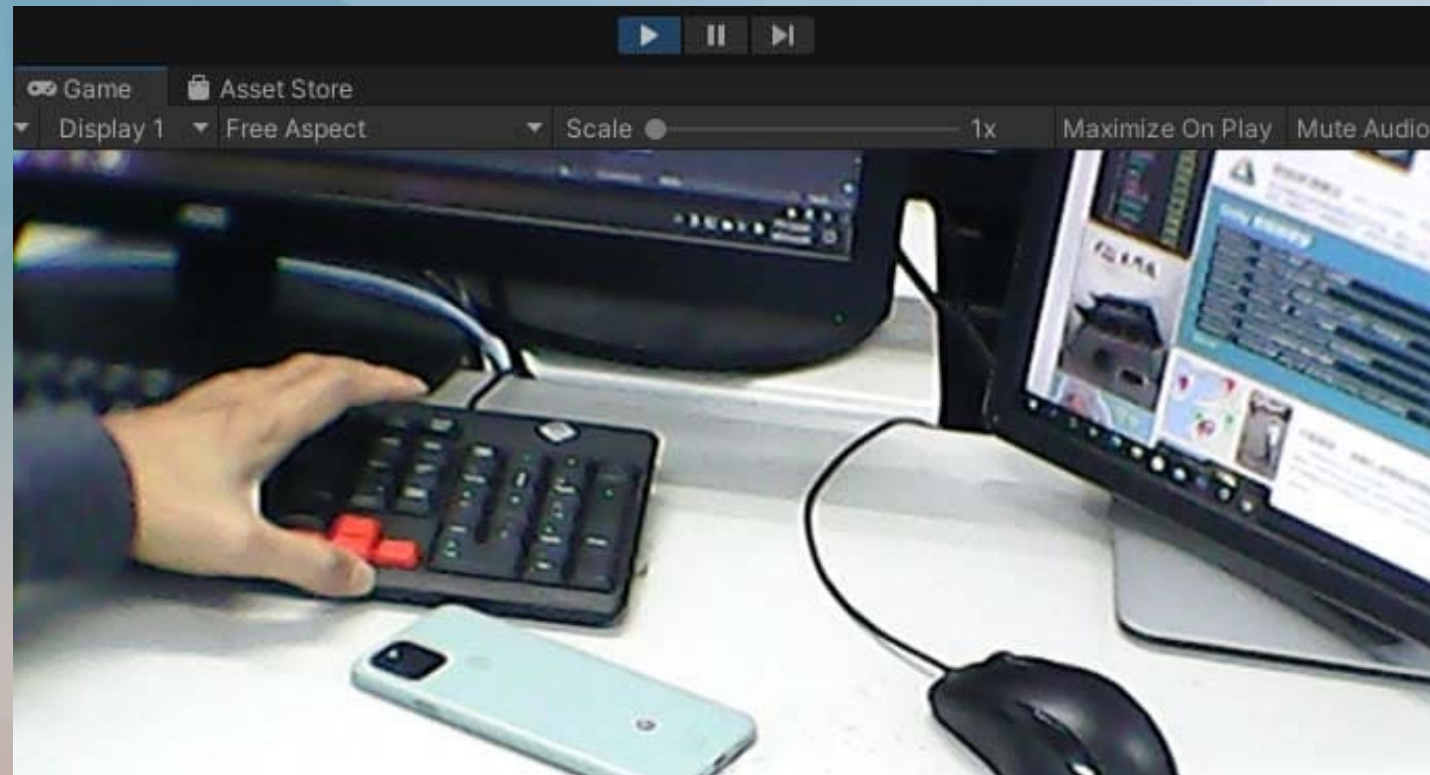
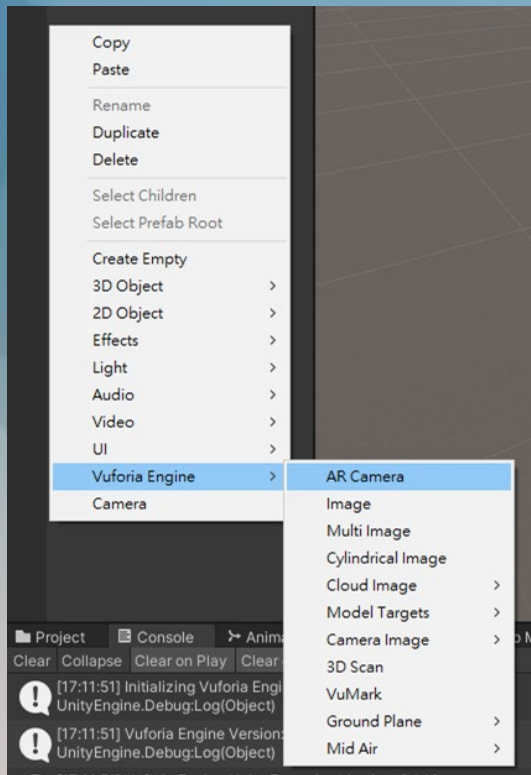
File > Build Settings 點擊 Player Setting，勾選 XR Settings 項目中的 Vuforia Augmented Reality Support (如右下圖)即可，此時 Project 中會產生一個 Resources 資料夾。若沒看到該選項，請點擊 XR Support Installers 中的超連結(如左下圖)下載，然後關掉 unity 進行安裝。



Unity環境架設

創建AR Camera

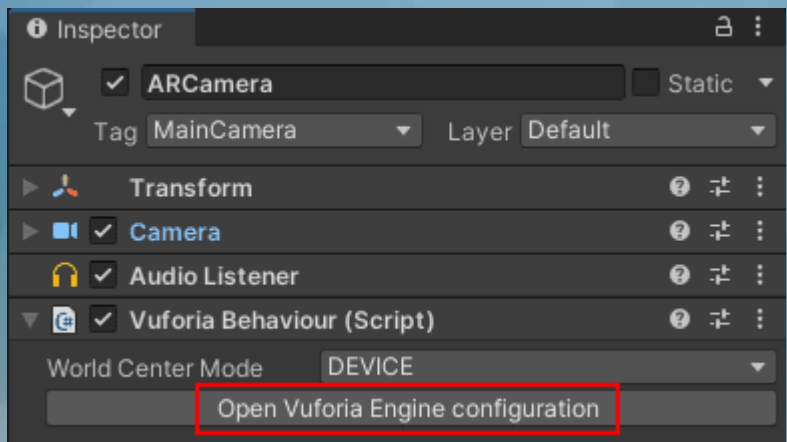
點選 GameObject > Vuforia Engine > AR Camera 新增一台 vuforia 的攝影機，然後刪除場景中的 Main Camera。點擊 Play 後，即可看到外接 webCam 或內建鏡頭拍攝的實景畫面。



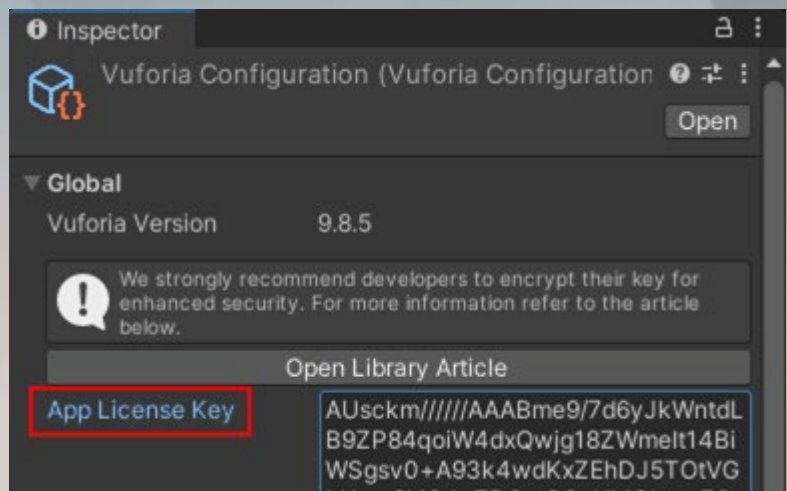
Unity環境架設

連接Vuforia

選取 ARCamera, 到 Inspector 點擊 Open Vuforia configuration 按鈕。



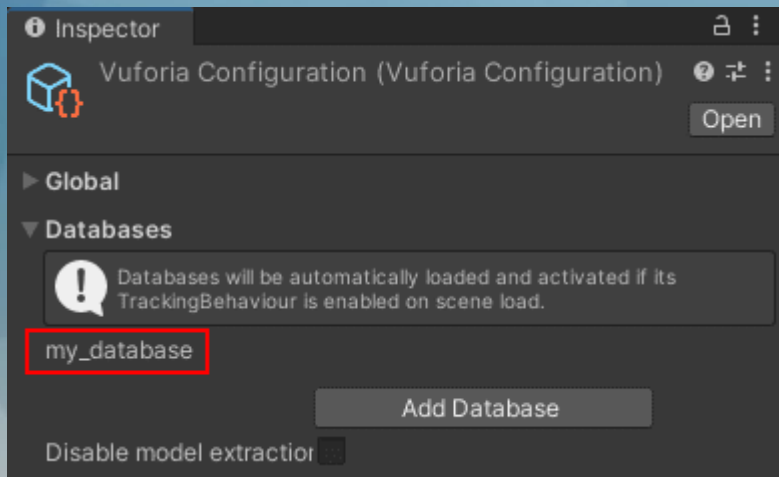
輸入Vuforia的License



Unity環境架設

連接DataBase

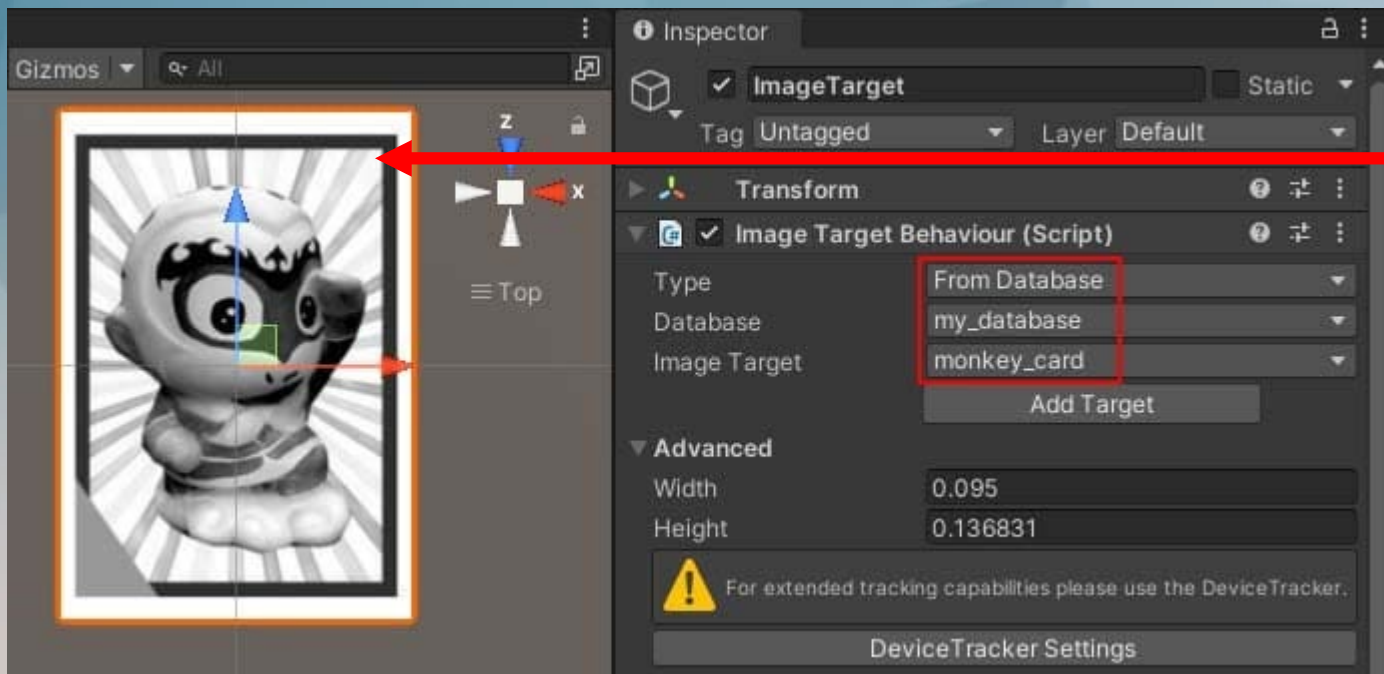
vuforia Developer Portal 網頁下載 Database(.unitypackage) 然後匯入 unity(下載時 Select a development platform 要選擇 Unity Editor), 即可在 Databases 項目中看到您的 Database 名稱。



Unity開發實作

新增辨識圖

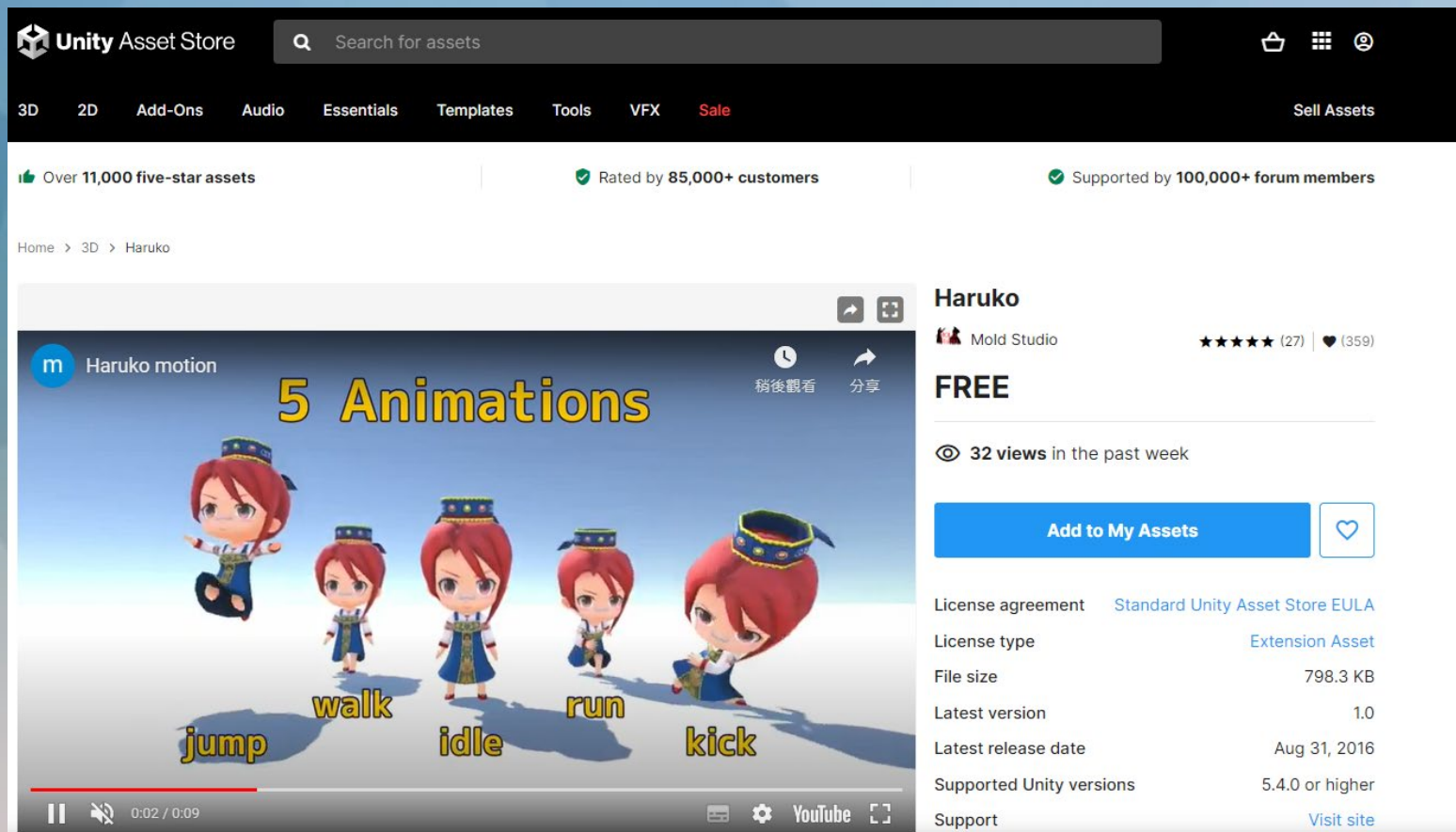
GameObject > Vuforia Engine > Image Target 新增一個 ImageTarget, 到 Inspector 把 Type 設為 From Database 然後選擇您的 Database 和 Image Target, 圖片就會出現在場景中。附帶一提, 點開 Advanced 可以看到圖片的寬(Width)和高(Height), 此寬度是您當初在 vuforia Developer Portal 上傳圖片時自己輸入的(以公尺為單位), 而高度則是根據圖片比例自動計算得來。



辨識圖

Unity開發實作

先去 [Asset store](#) 找一個具有動畫動作的模型，並加入到unity



Unity Asset Store

Search for assets

3D 2D Add-Ons Audio Essentials Templates Tools VFX Sale Sell Assets

Over 11,000 five-star assets

Rated by 85,000+ customers

Supported by 100,000+ forum members

Home > 3D > Haruko

Haruko motion

5 Animations

稍後觀看 分享

jump walk idle run kick

Haruko

Mold Studio ★★★★★ (27) | ❤️ (359)

FREE

32 views in the past week

Add to My Assets

License agreement [Standard Unity Asset Store EULA](#)

License type [Extension Asset](#)

File size 798.3 KB

Latest version 1.0

Latest release date Aug 31, 2016

Supported Unity versions 5.4.0 or higher

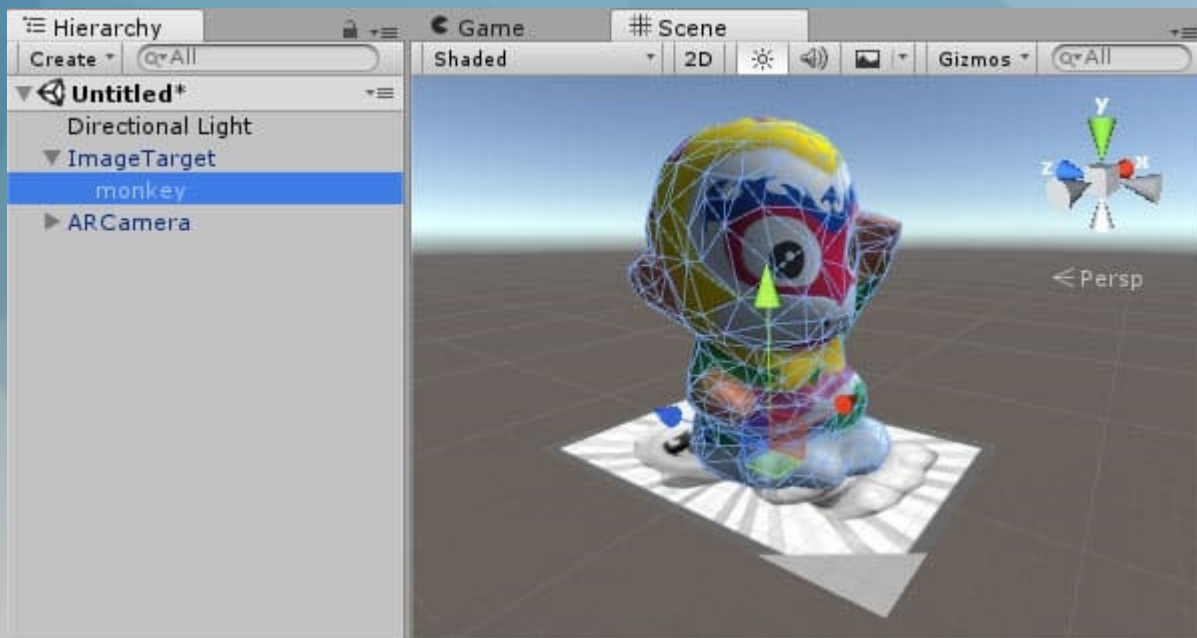
Support [Visit site](#)

[範例模型連結](#)

Unity開發實作

新增生成物(2Dor3D)

匯入模型，在 Hierarchy 中把模型拖拉到 ImageTarget 上放開(讓模型成為 ImageTarget 的子物件)，然後調整到欲顯現的相對位置和大小。



Unity開發實作

測試

按下 play(或發佈到手機執行)，將鏡頭對準圖卡就會顯現模型。

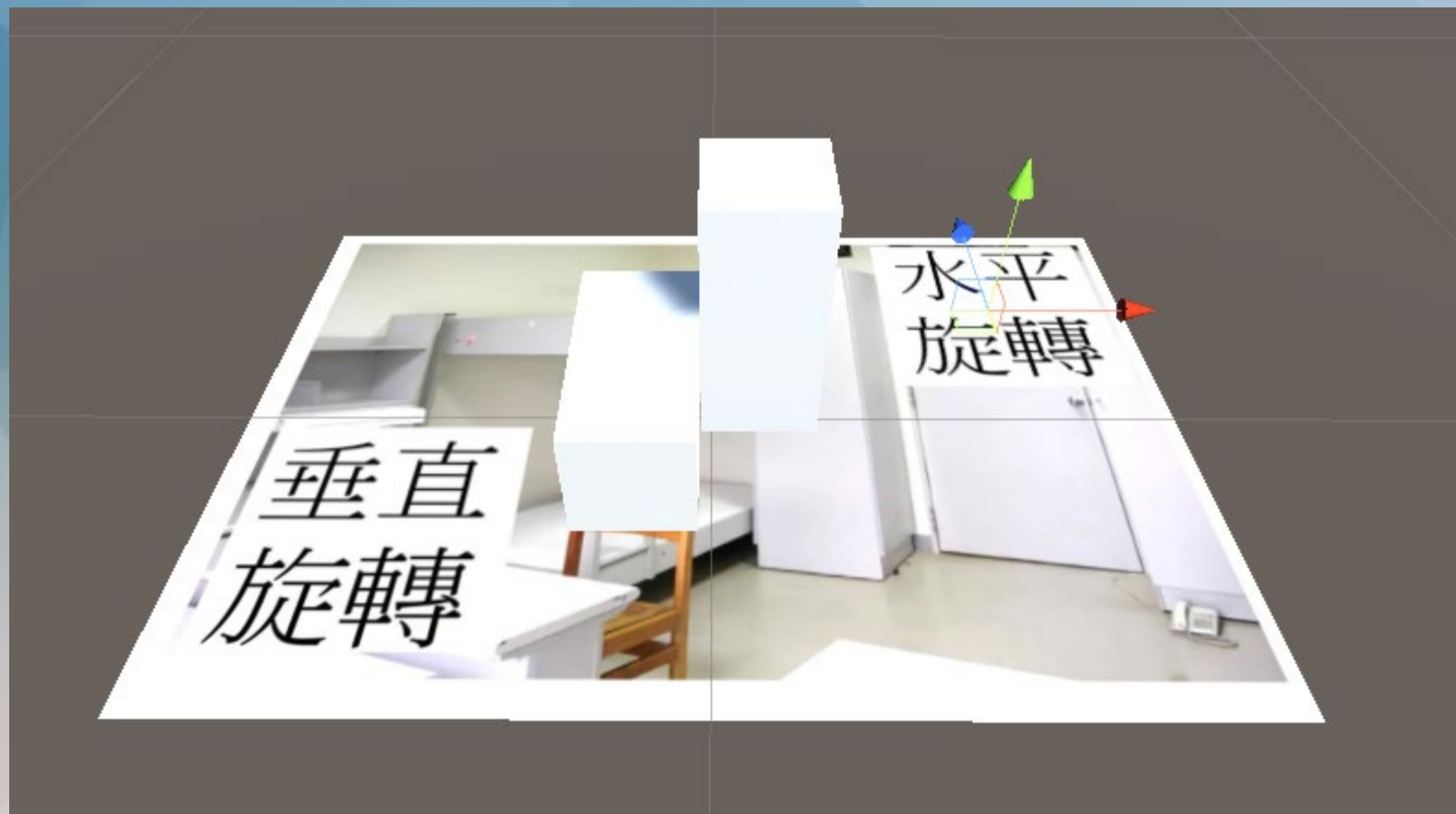


實作二

使用虛擬按鈕控制3D物件

Unity開發實作(虛擬按鈕)

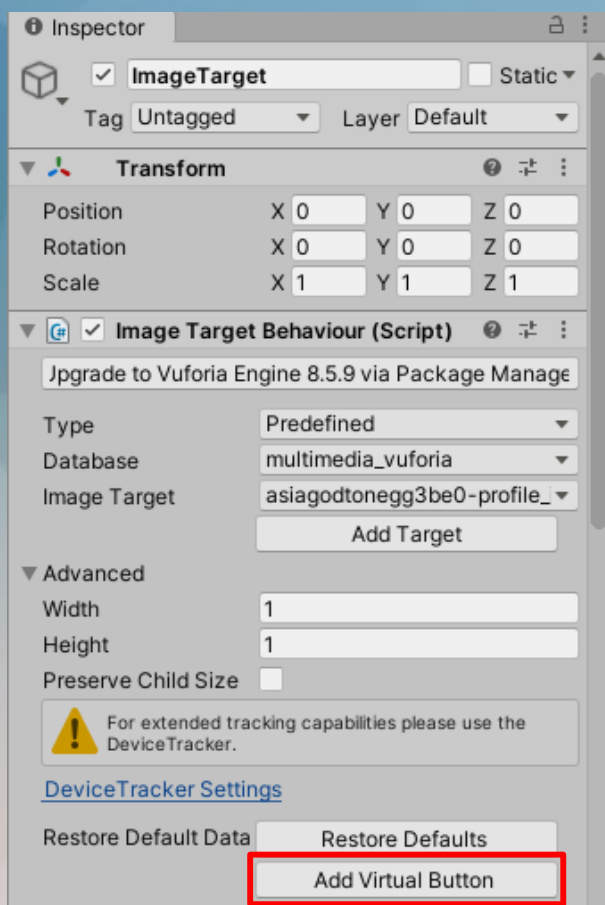
製作一個3D模型如下



Unity開發實作(虛擬按鈕)

新增VirtualButton

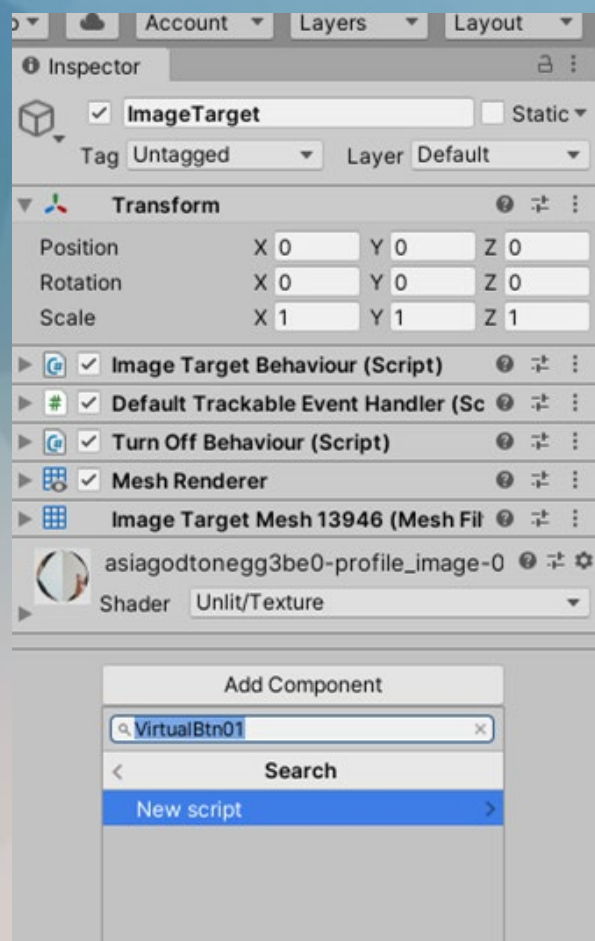
ImageTarget->Image Target Behaviour(Script)->Advanced->Add Virtual Button, 並將button擺到想要的位置



Unity開發實作(虛擬按鈕)

程式撰寫

在ImageTarget新增一個c#腳本



Unity開發實作(虛擬按鈕)

程式碼(可參考至上次的旋轉教學ppt), 參考/單一按鈕/btn01

```
1 using System.Collections;
2 using System.Collections.Generic;
3 using UnityEngine;
4 using Vuforia;
5
6 0 references
7 public class VirtualButtonController : MonoBehaviour
8 {
9     1 reference
10    public GameObject cube;
11    0 references
12    public VirtualButtonBehaviour vb;
13    1 reference
14    public float y = 30;
15    // Start is called before the first frame update
16    0 references
17    void Start()
18    {
19        VirtualButtonBehaviour[] vbs = GetComponentsInChildren<VirtualButtonBehaviour>()
20        for (int i = 0; i < vbs.Length; i++){
21            vbs[i].RegisterOnButtonPressed(OnButtonPressed);
22            vbs[i].RegisterOnButtonReleased(OnButtonReleased);
23        }
24    }
25
26    1 reference
27    public void OnButtonPressed(VirtualButtonBehaviour vb){
28        print( vb.name + " 按鈕被按下 " );
29        cube.transform.Rotate(0, y, 0);
30    }
31
32    1 reference
33    public void OnButtonReleased(VirtualButtonBehaviour vb){
34        print( vb.name + " 按鈕被放開 " );
35    }
36
37    // Update is called once per frame
38    0 references
39    void Update()
40    {
41    }
42 }
```

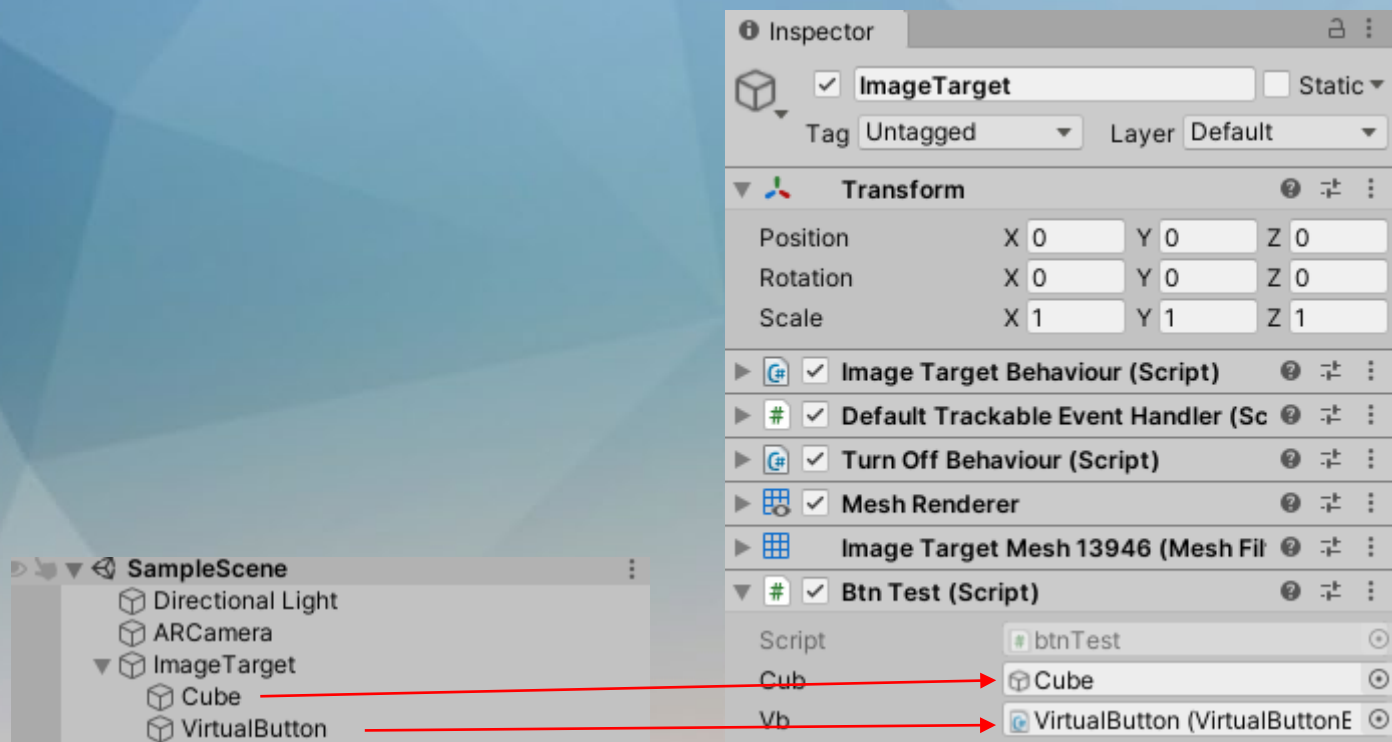
← 於程式開始執行時設定有幾個虛擬按鈕

Interface實作

← 轉動y軸

Unity開發實作(虛擬按鈕)

拖動物件至腳本



Unity開發實作(虛擬按鈕)

測試



手指未觸碰按鈕

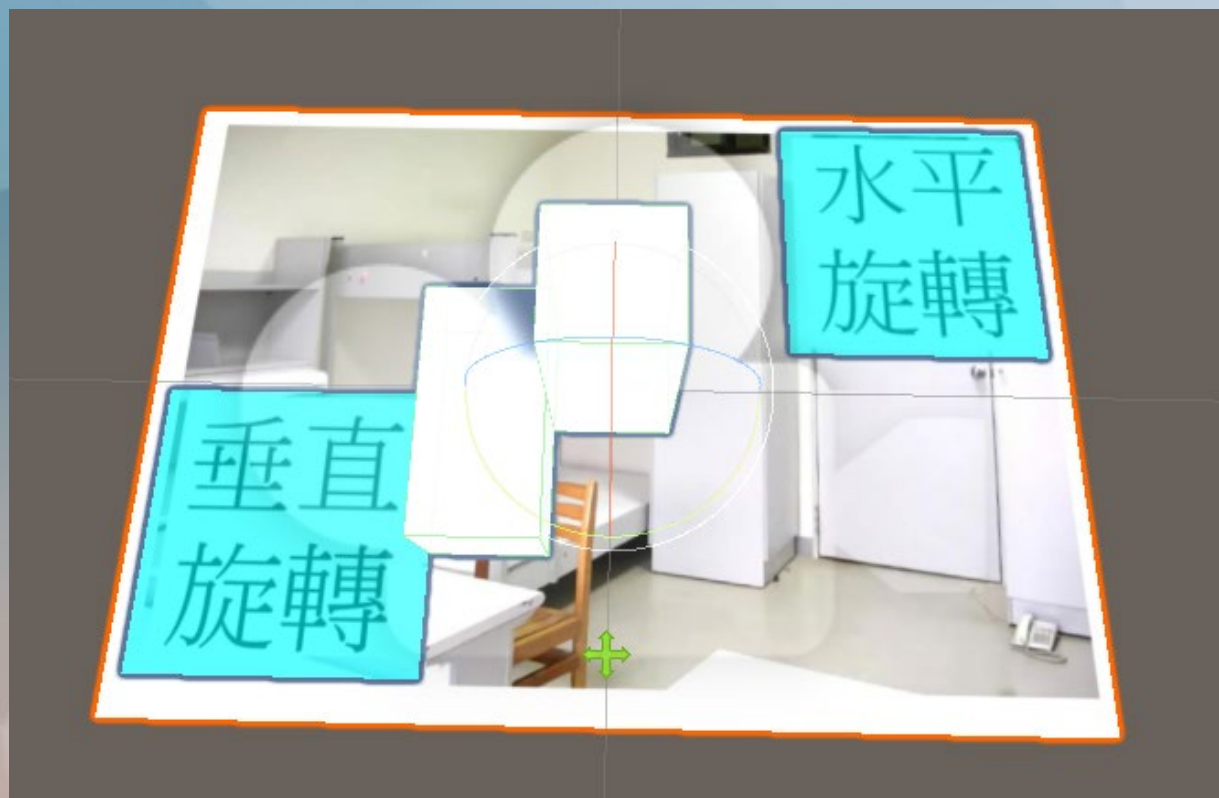
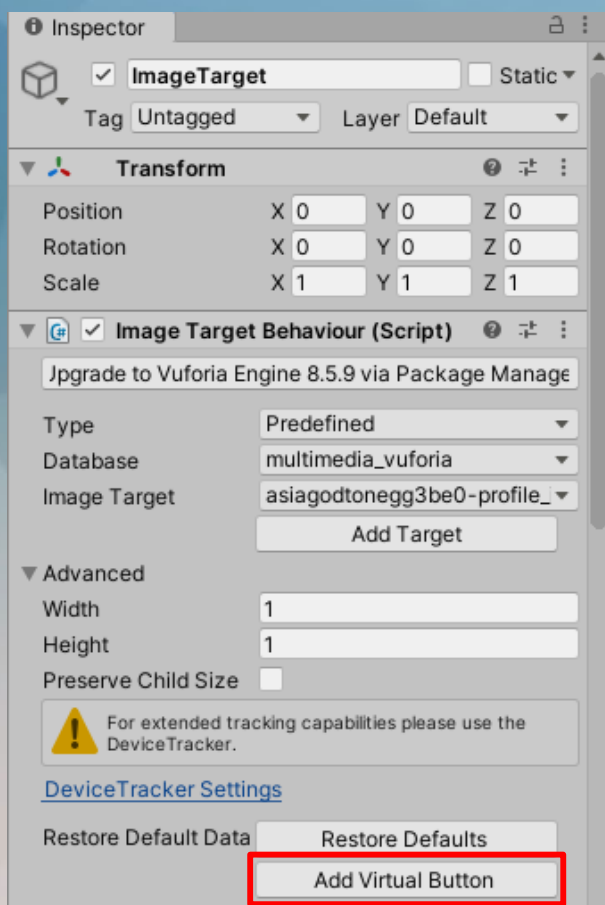


手指觸碰按鈕

Unity開發實作(虛擬按鈕)

製作第二個按鈕

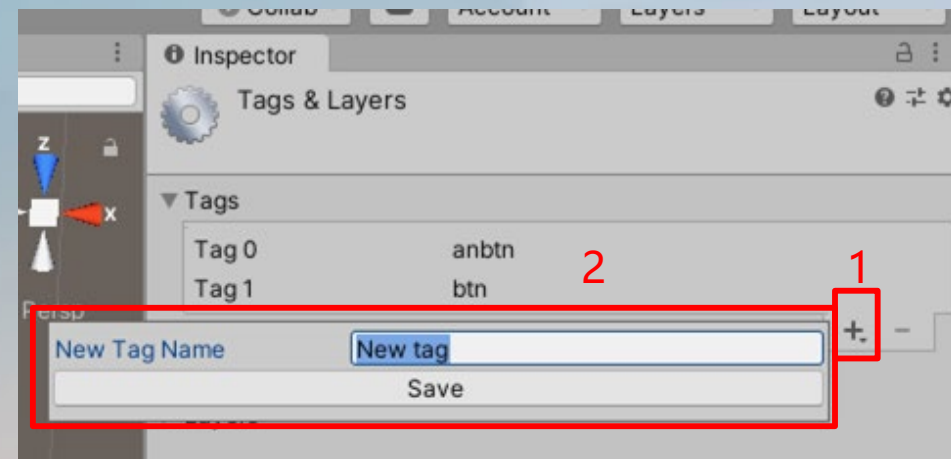
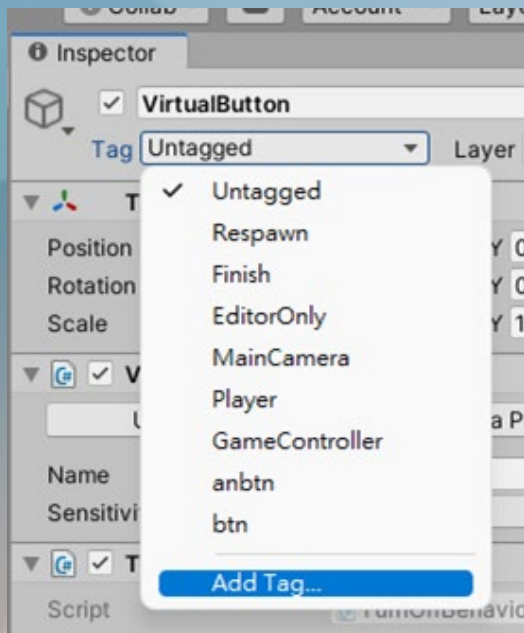
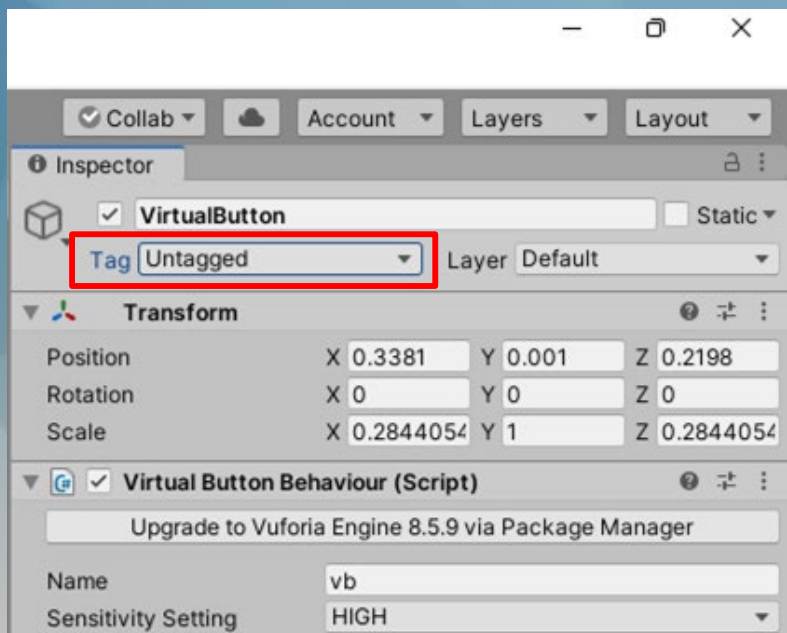
接著來製作按鈕吧，跟上面一樣先建立一個virtual button



Unity開發實作(虛擬按鈕)

新增tag

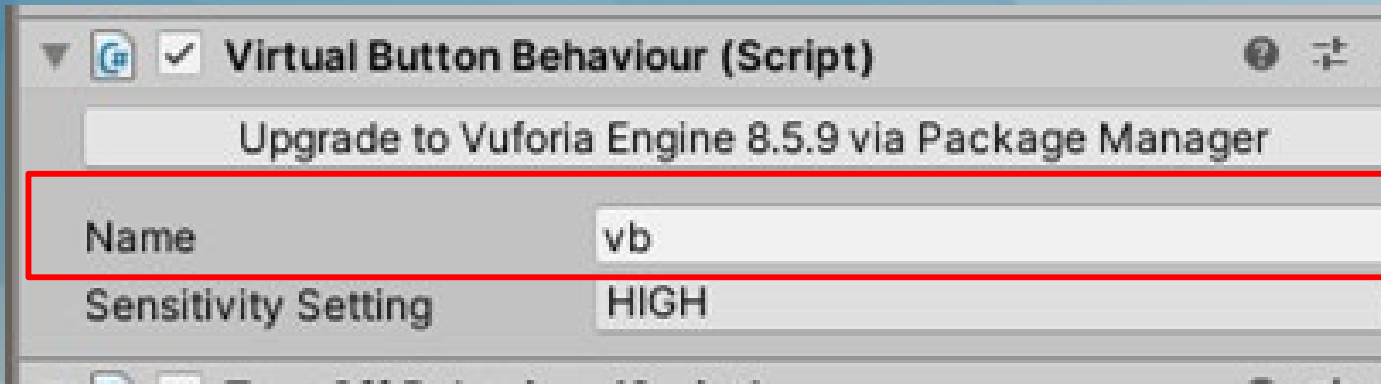
新增兩個tag，分別掛在兩個按鈕上，辨別出按鈕



Unity開發實作(虛擬按鈕)

更改VirtualButton名字

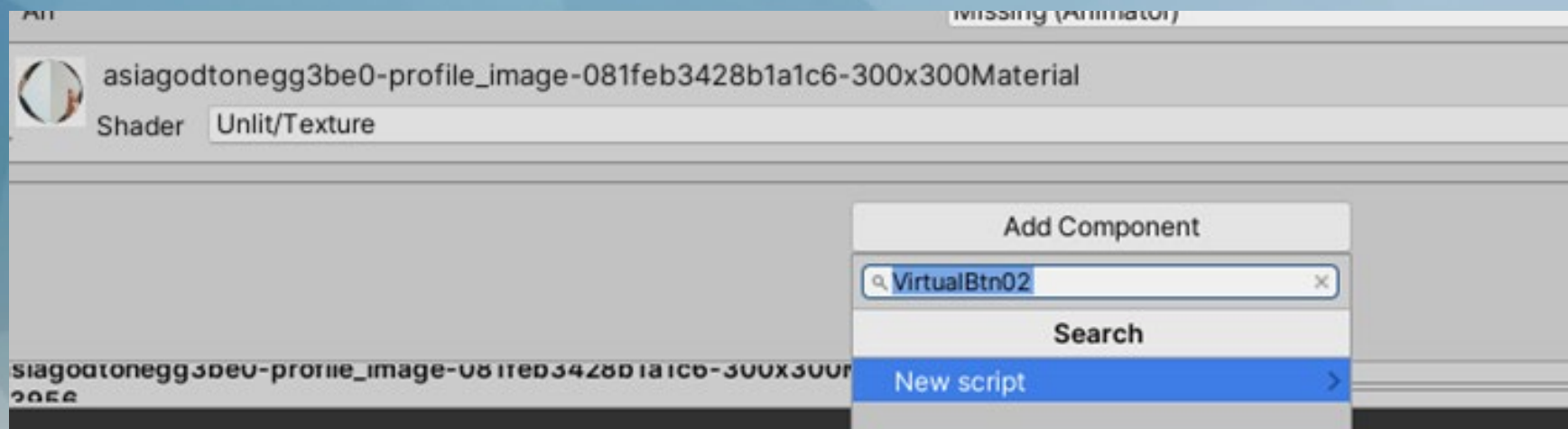
更改在Virtual Button Behaviour的script中的Name(2個按鈕都要改), 注意不是更改GameObject的名字



Unity開發實作(虛擬按鈕)

程式撰寫

在ImageTarget新增一個c#腳本



Unity開發實作(虛擬按鈕)

```
VB2controller.cs
Assets > VB2controller.cs > VB2controller
1 using System.Collections;
2 using System.Collections.Generic;
3 using UnityEngine;
4 using Vuforia;
5
6 public class VB2controller : MonoBehaviour
7 {
8     public GameObject cube;
9     public VirtualButtonBehaviour vb;
10    public float y = 30;
11    public float x = 30;
12    // Start is called before the first frame update
13    void Start()
14    {
15        cube = GameObject.Find("Cube");
16        VirtualButtonBehaviour[] vbs = GetComponentsInChildren<VirtualButtonBehaviour>();
17        for(int i = 0; i < vbs.Length; i++) {
18            vbs[i].RegisterOnButtonPressed(OnButtonPressed);
19            vbs[i].RegisterOnButtonReleased(OnButtonReleased);
20        }
21    }
22    public void OnButtonPressed(VirtualButtonBehaviour vb) {
23
24        print(vb.name + "按鈕被按下 !");
25
26        if (vb.gameObject.CompareTag("VB2") == true) {
27            cube.transform.Rotate(x,0,0);
28        }
29    }
30
31    public void OnButtonReleased(VirtualButtonBehaviour vb) {
32        print (vb.name + "按鈕被放開 !");
33    }
34
35    // Update is called once per frame
```

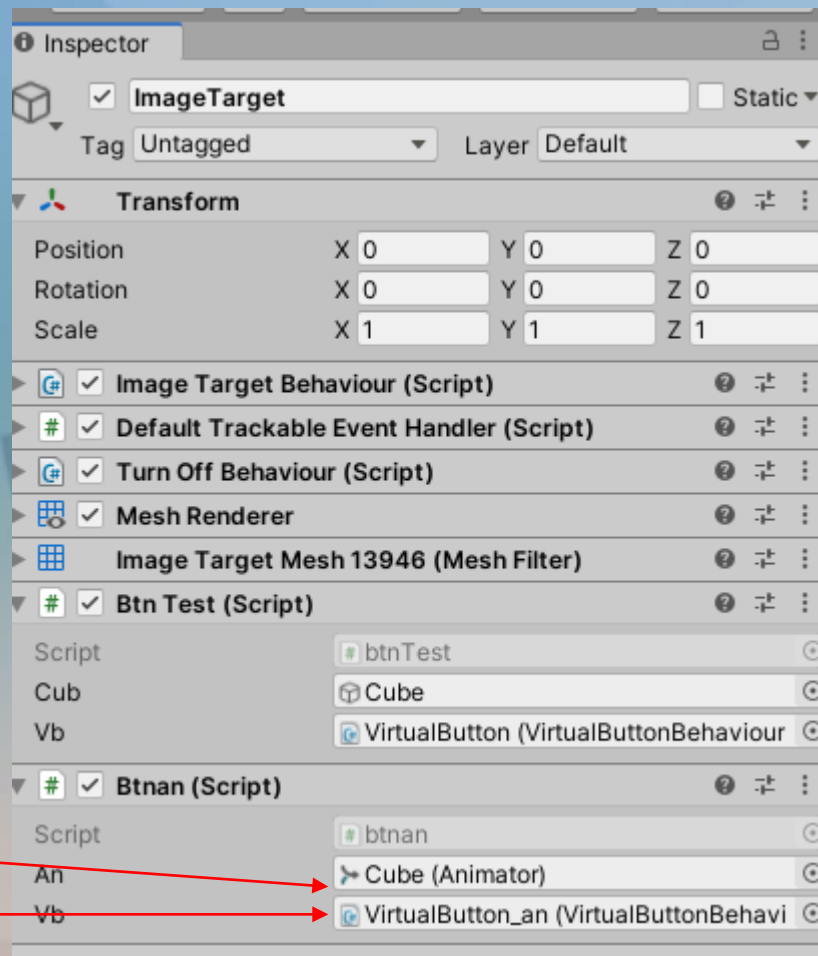
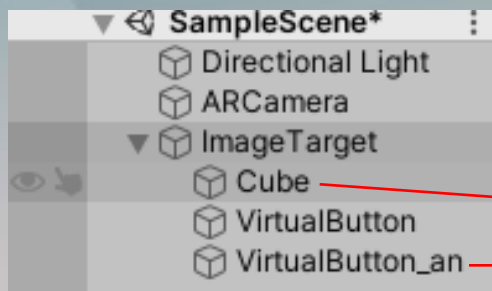
於程式開始執行時設定有幾個虛擬按鈕

判別是哪個按鈕以免誤觸其他做出多餘的動作

轉動x軸

Unity開發實作(虛擬按鈕)

拖動物件至腳本



Unity開發實作(虛擬按鈕)

修改按鈕01程式碼，參考/兩個按鈕/btn01修改

```
1  using System.Collections;
2  using System.Collections.Generic;
3  using UnityEngine;
4  using Vuforia;
5
6  public class btnTest : MonoBehaviour,IVirtualButtonEventHandler
7  {
8      public GameObject cub;
9      public VirtualButtonBehaviour vb;
10     public float y=30;//y軸旋轉值，可自由更改
11
12
13     void Start()
14     {
15         VirtualButtonBehaviour[] vbs = GetComponentsInChildren<VirtualButtonBehaviour>();
16         for (int i = 0; i < vbs.Length; i++) { vbs[i].RegisterEventHandler(this); }
17     }
18     public void OnButtonPressed(VirtualButtonBehaviour vb)
19     {
20         if (vb.gameObject.CompareTag("btn") == true) 判別是哪個按鈕以免誤觸其他做出多餘的動作
21         {
22             cub.transform.Rotate(0, y, 0);
23         }
24     }
25
26     public void OnButtonReleased(VirtualButtonBehaviour vb)
27     {
28     }
29 }
30
```

Unity開發實作(虛擬按鈕)

實際測試



手指觸碰右按鈕旋轉y軸



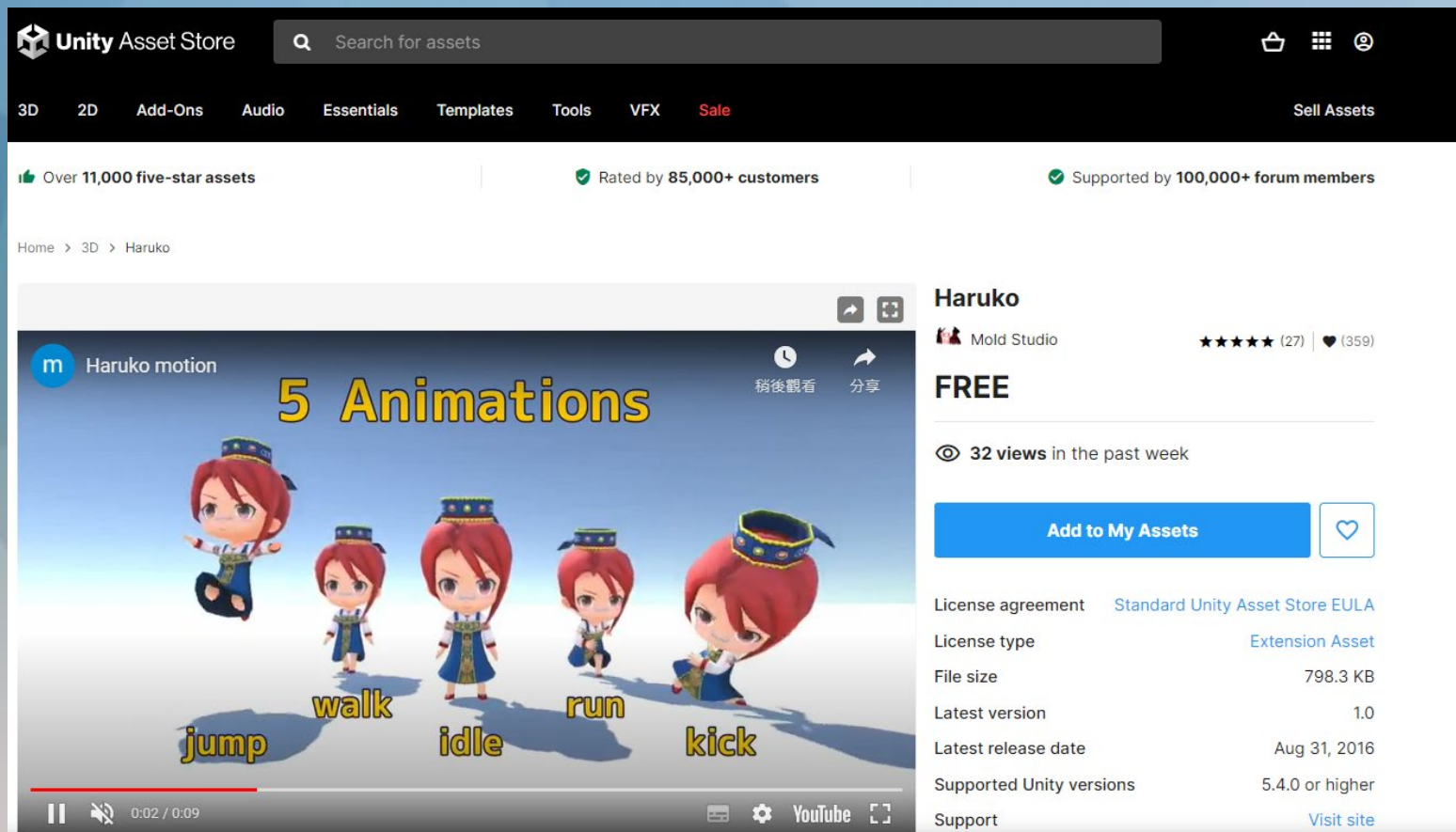
手指觸碰左按鈕旋轉x軸

實作三

使用UI按鈕控制3D物件

Unity開發實作(使用UI按鈕控制)

先去 [Asset store](#) 找一個具有動畫動作的模型，並加入到unity



Unity Asset Store

Search for assets

3D 2D Add-Ons Audio Essentials Templates Tools VFX Sale Sell Assets

Over 11,000 five-star assets

Rated by 85,000+ customers

Supported by 100,000+ forum members

Home > 3D > Haruko

Haruko motion

5 Animations

稍後觀看 分享

jump walk idle run kick

Haruko

Mold Studio ★★★★★ (27) | ❤️ (359)

FREE

32 views in the past week

Add to My Assets

License agreement [Standard Unity Asset Store EULA](#)

License type [Extension Asset](#)

File size 798.3 KB

Latest version 1.0

Latest release date Aug 31, 2016

Supported Unity versions 5.4.0 or higher

Support [Visit site](#)

[範例模型連結](#)

Unity開發實作(使用UI按鈕控制)

建立image target, 並將asset/haruko/models模型拖入

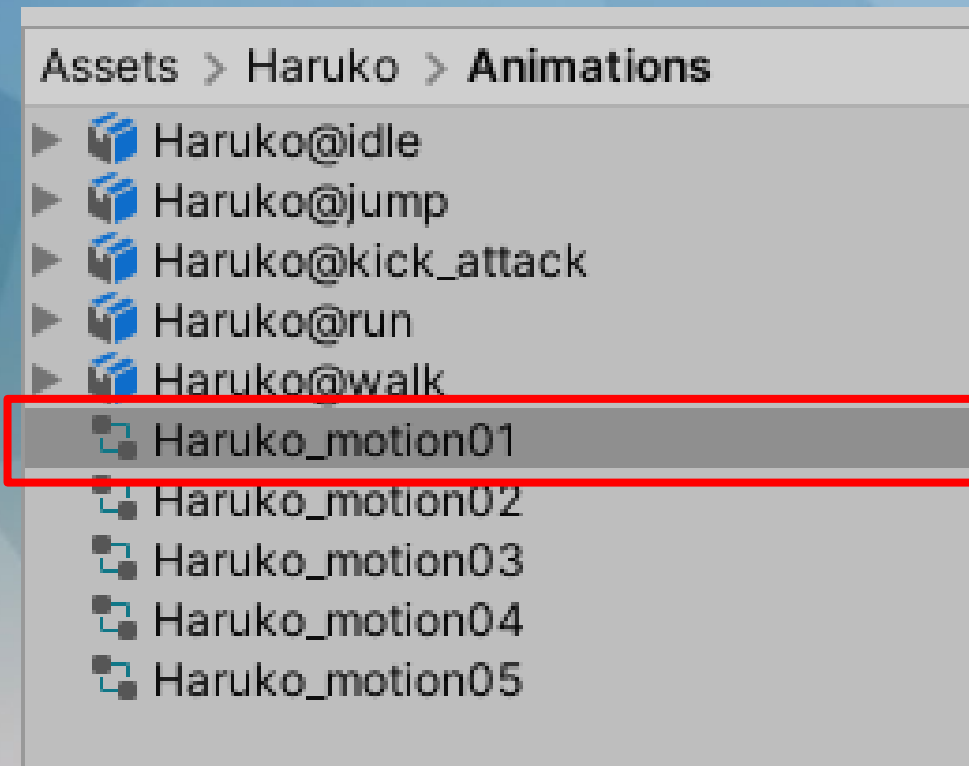
Assets > Haruko > Models

▶ Haruko



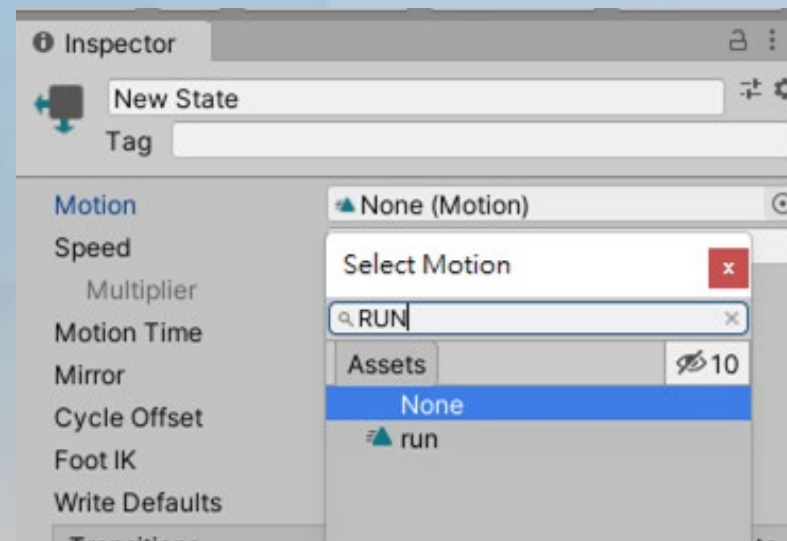
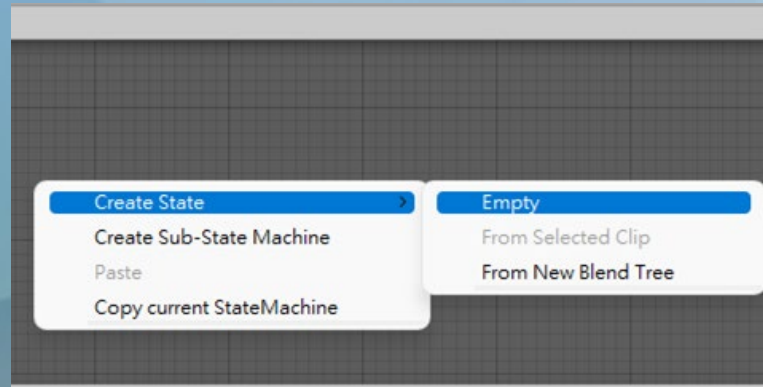
Unity開發實作(使用UI按鈕控制)

製作動畫控制器，進入目錄中選擇**Haruko_motion01**進行修改



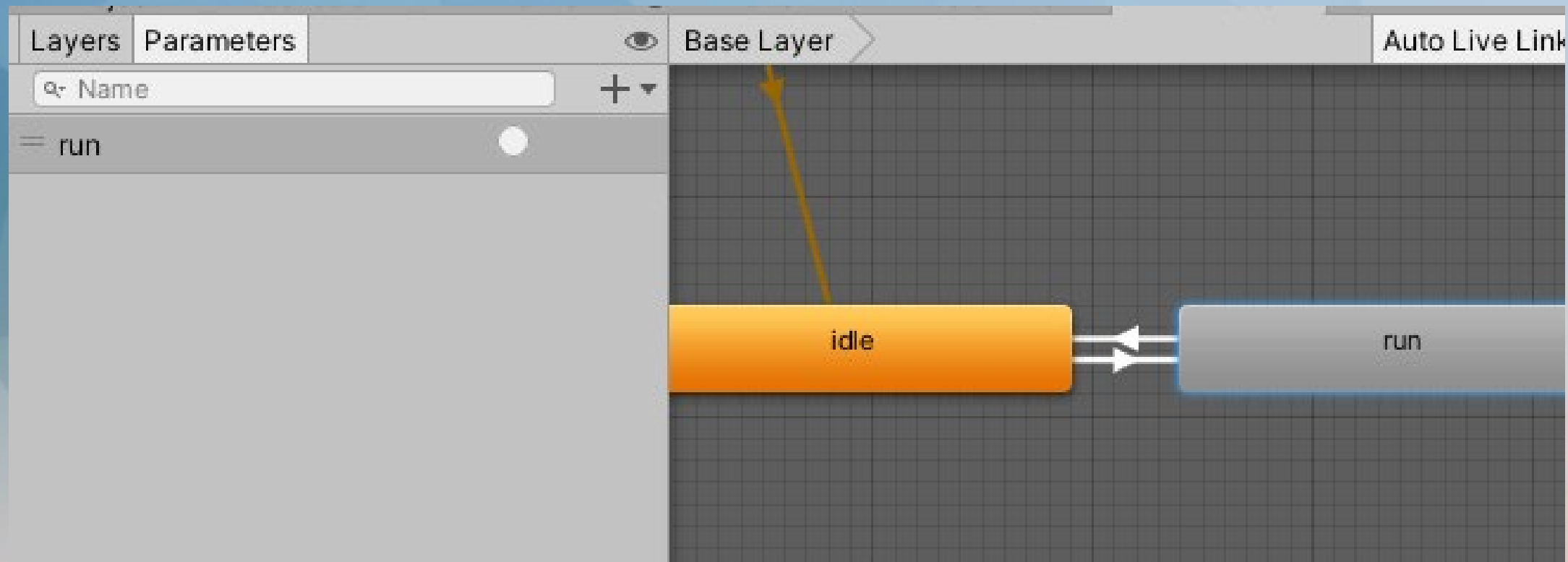
Unity開發實作(使用UI按鈕控制)

將想要的動作加入到動畫控制器中



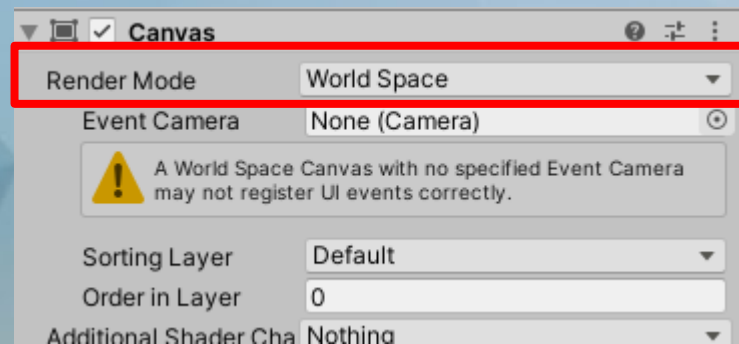
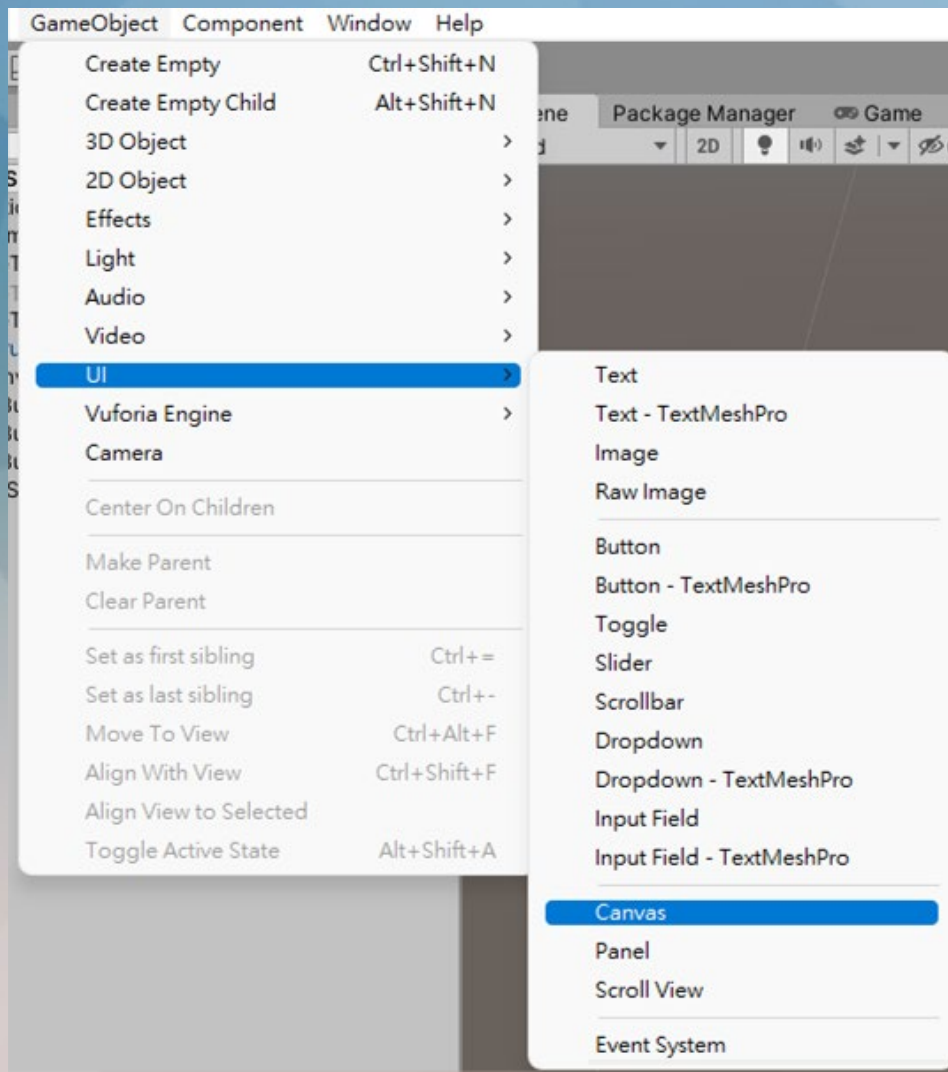
Unity開發實作(使用UI按鈕控制)

建立trigger、make transition



Unity開發實作(使用UI按鈕控制)

建立GameObject->UI-> canvas, 並將Render Mode改成world space



改成world space

Unity開發實作(使用UI按鈕控制)

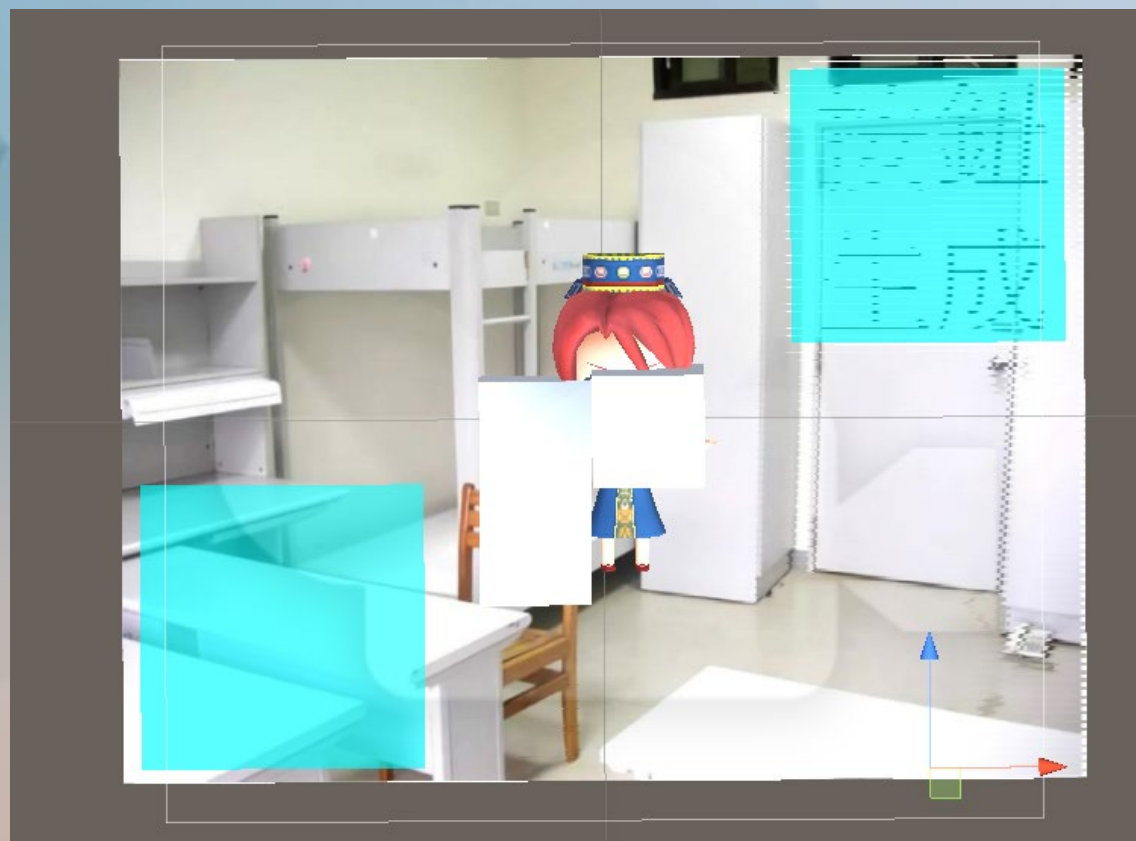
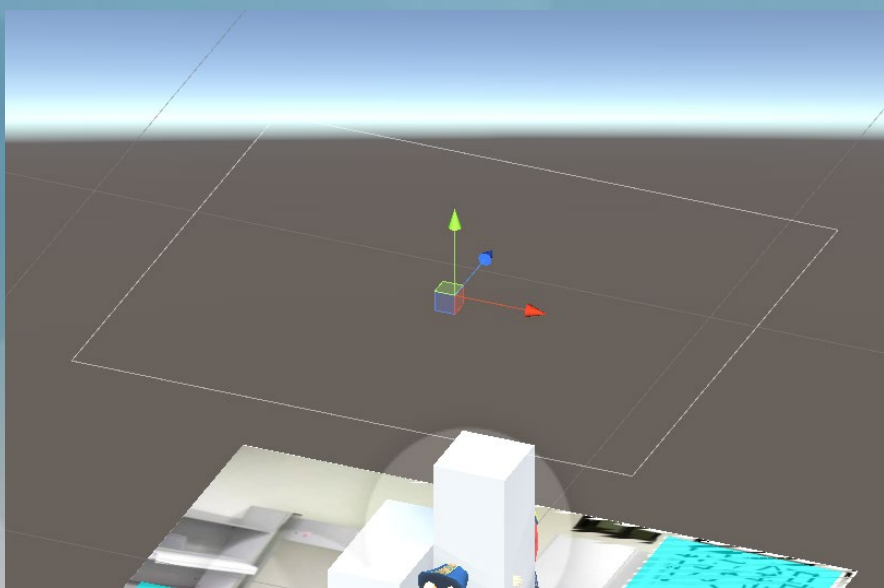
將Render Mode改成world space，才能把canvas拖動到自由的位置



改成world space

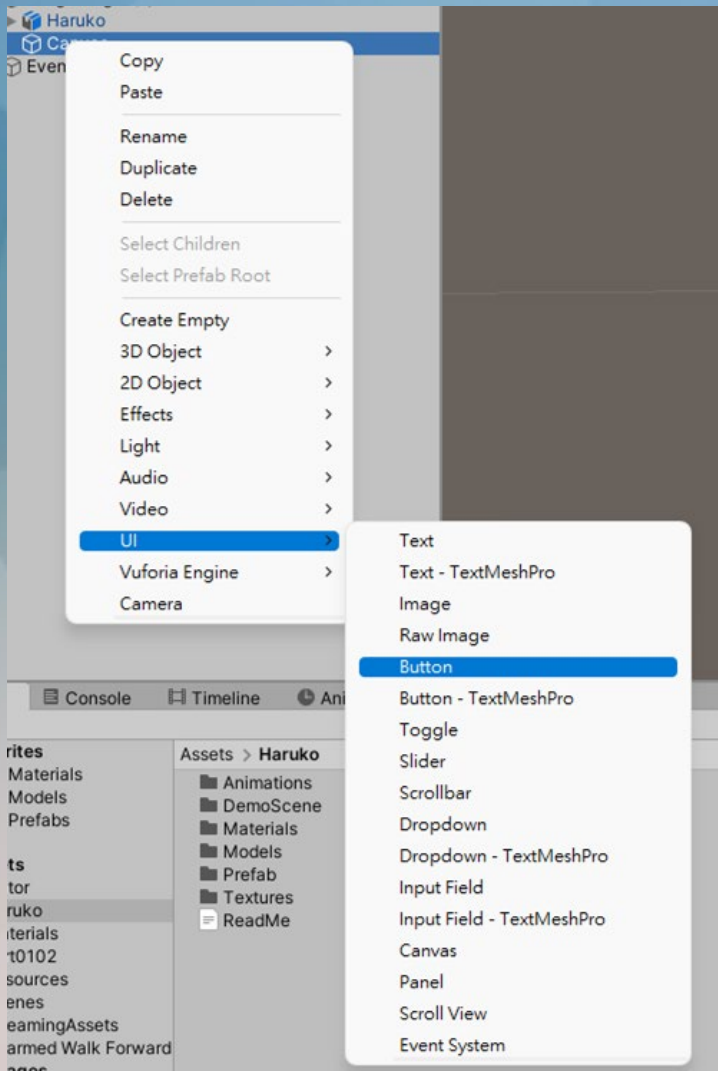
Unity開發實作(使用UI按鈕控制)

將UI canvas掛在image target下，並將位置(快捷鍵w)移到適當位置(平行於image target)



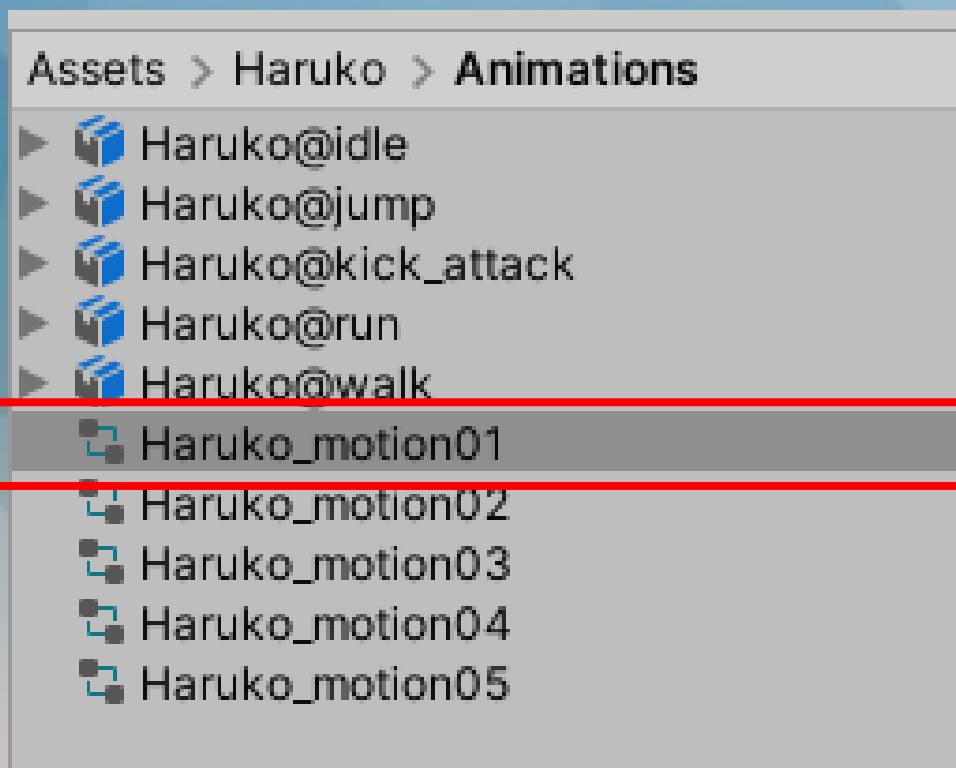
Unity開發實作(使用UI按鈕控制)

在canvas平行於image target後，建立按鈕並調到適當位置(盡量不要離image target太遠)



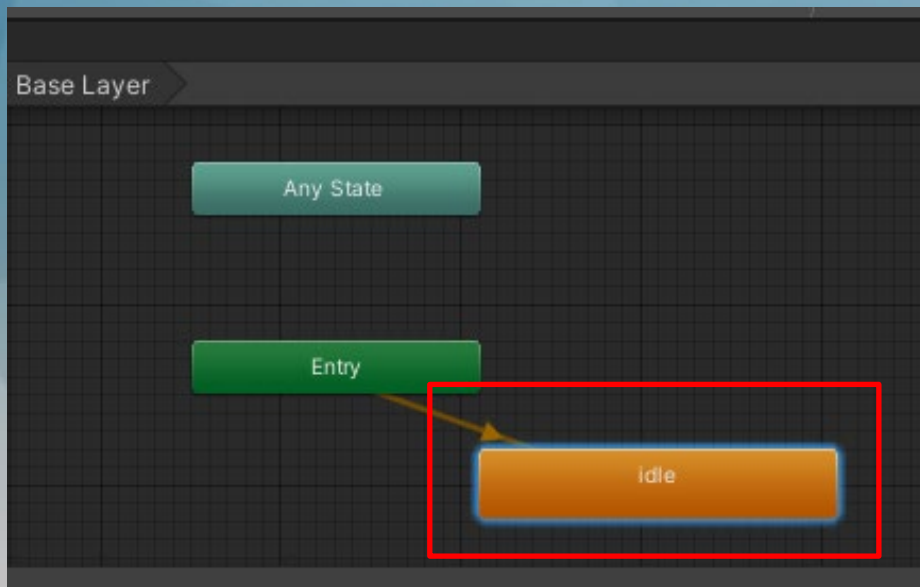
Unity開發實作(使用UI按鈕控制)

接著要製作動畫控制器，
進入目錄中選擇**Haruko_motion01**的動畫控制器進行修改



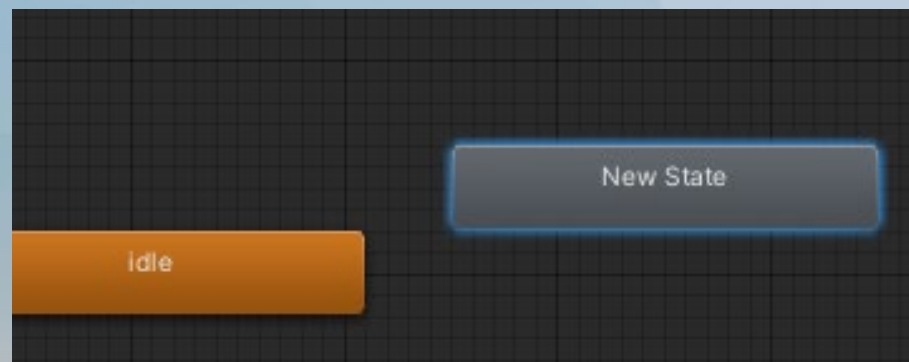
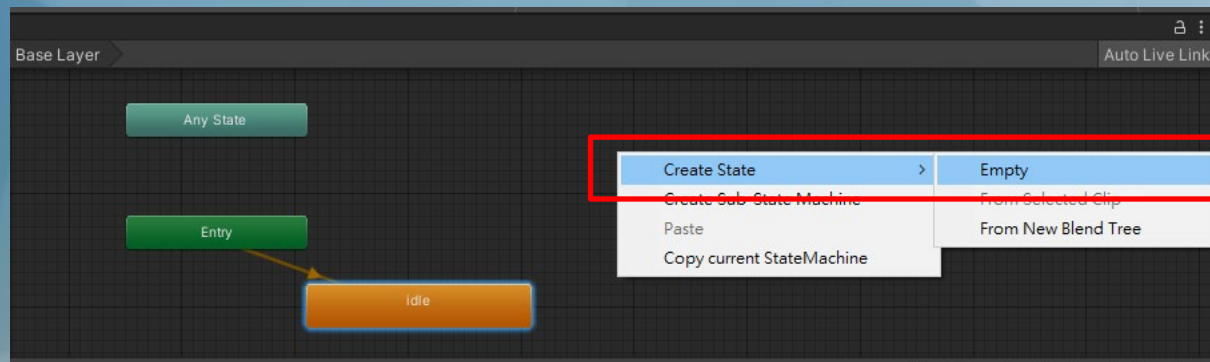
Unity開發實作(使用UI按鈕控制)

進入動畫控制器畫面，
橘色的idle為該動畫控制器的預設動畫，即遊戲執行時此動畫為第一個執行的，
執行完不是重複進行動畫就是變成靜止。



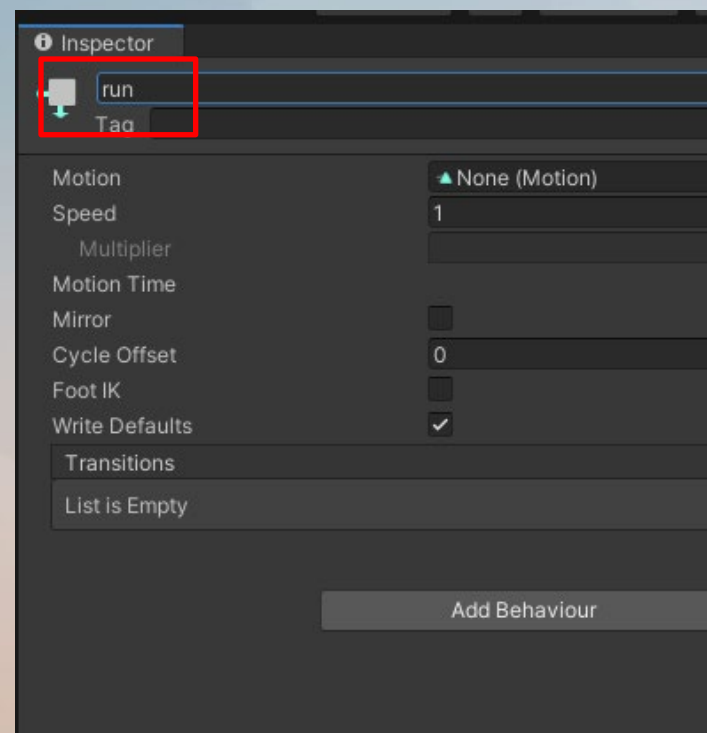
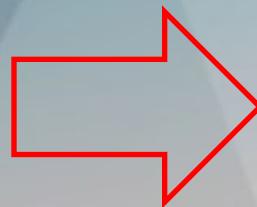
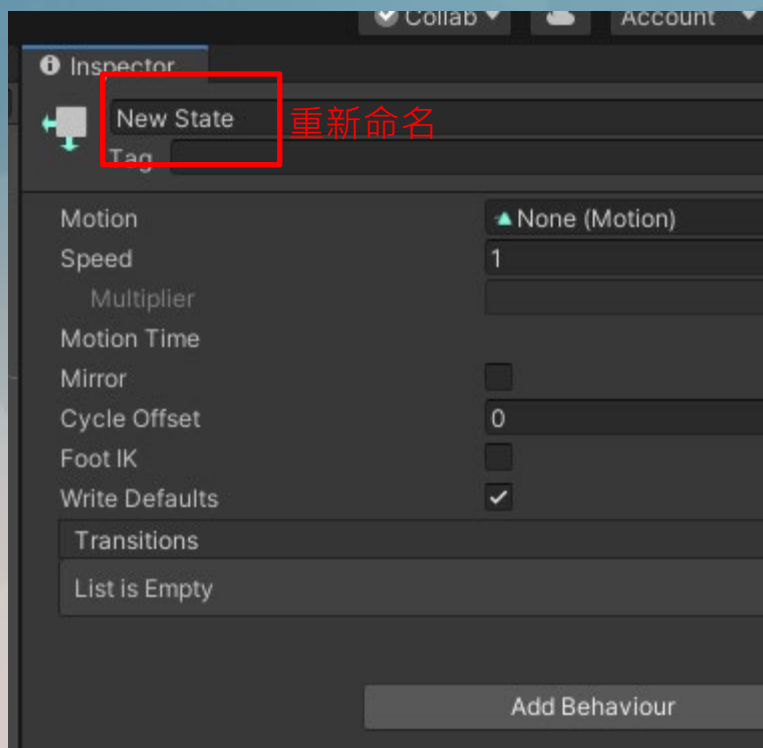
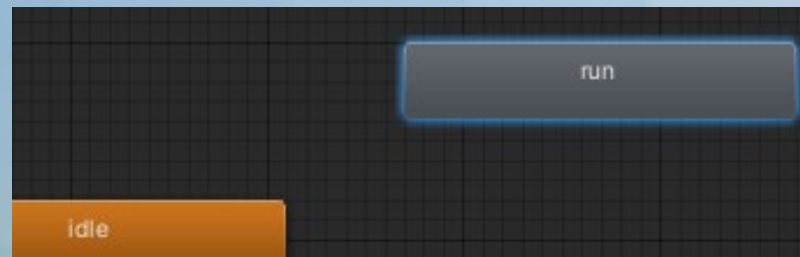
Unity開發實作(使用UI按鈕控制)

於是我們需要建立其他動畫，讓角色看起來生動，
在動畫控制器頁面的空白處中，滑鼠右鍵->Create state->empty



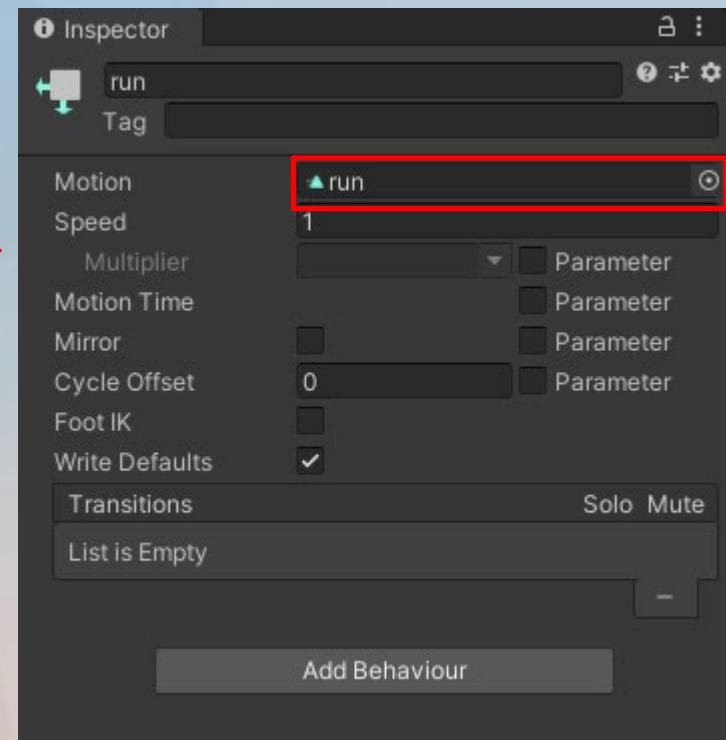
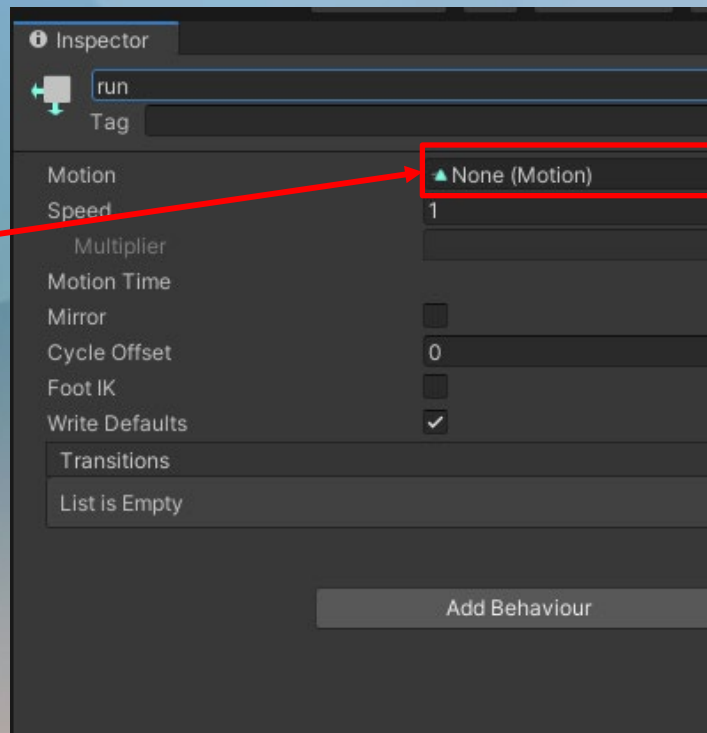
Unity開發實作(使用UI按鈕控制)

建立完成後於inspector重新命名。



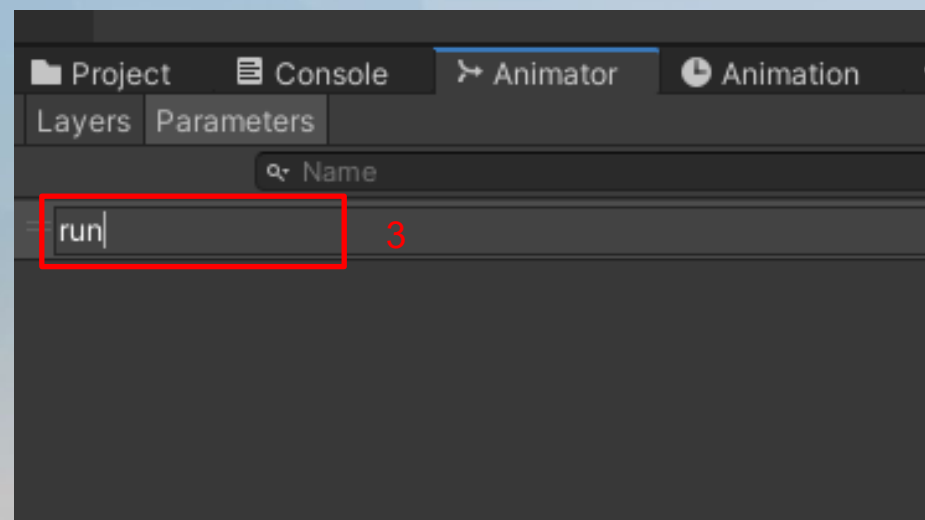
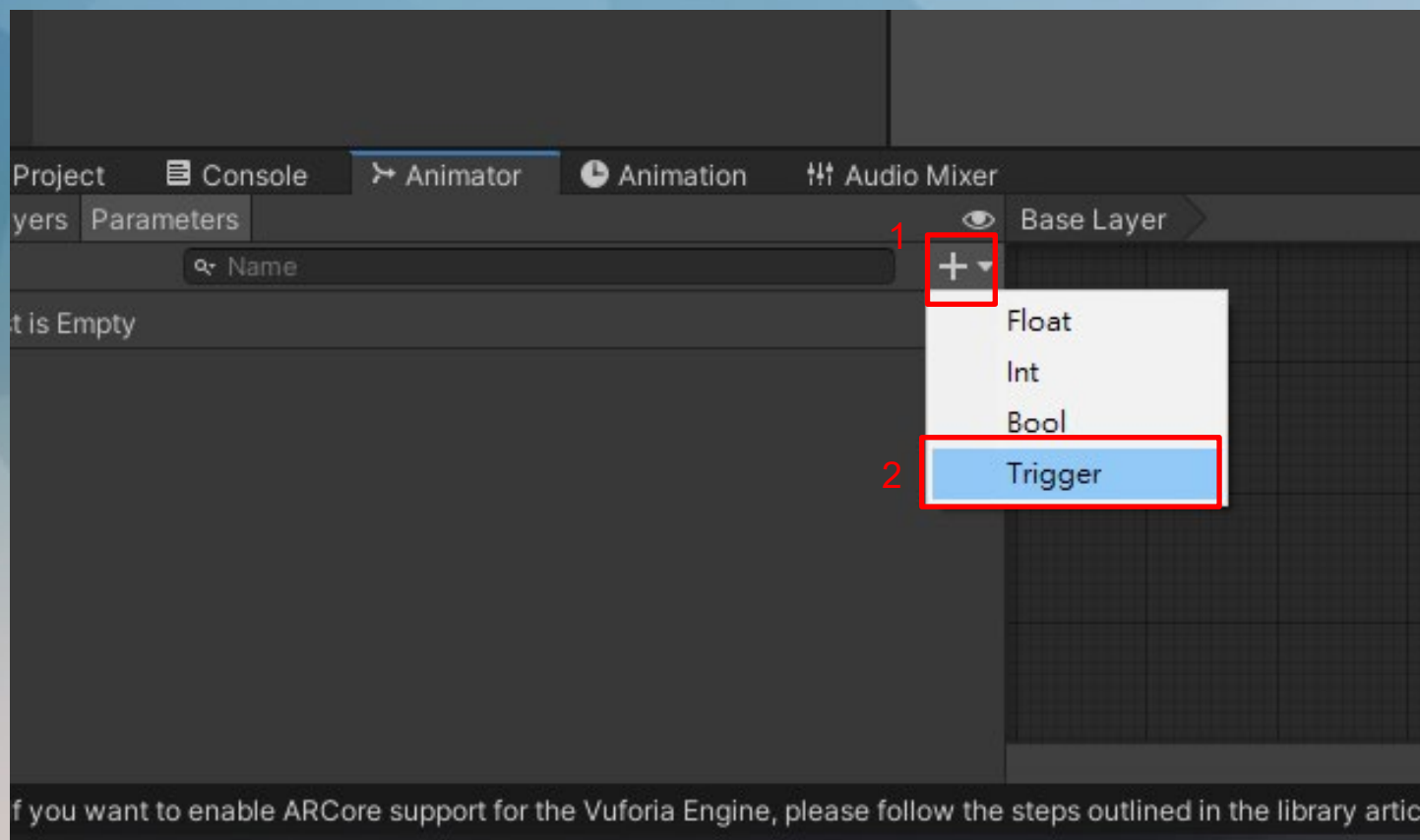
Unity開發實作(使用UI按鈕控制)

將想要的動作加入到動畫控制器(run)中



Unity開發實作(使用UI按鈕控制)

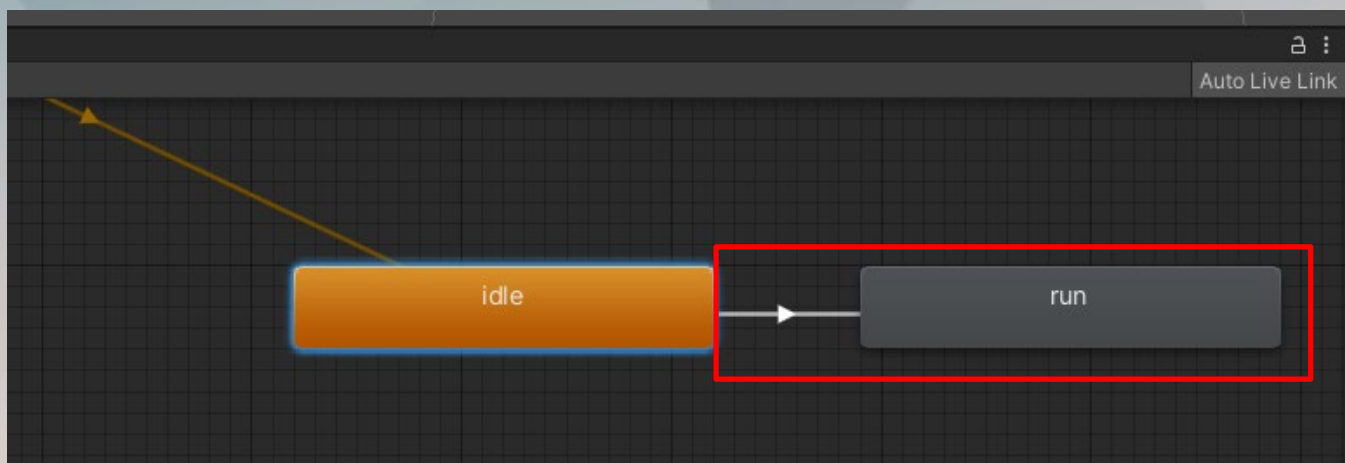
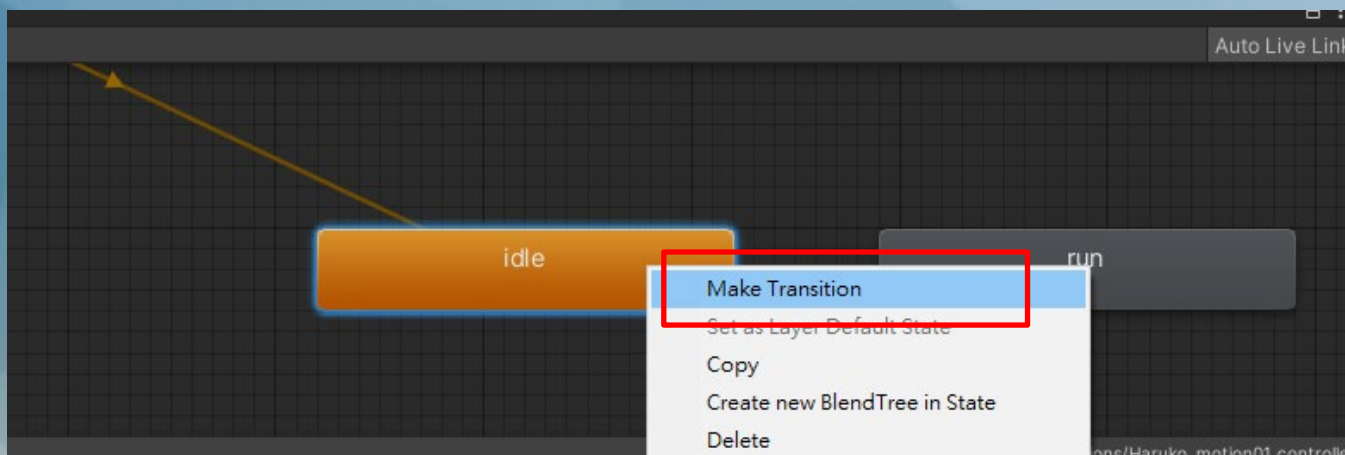
建立trigger, 點擊+號後選擇trigger並命名



If you want to enable ARCore support for the Vuforia Engine, please follow the steps outlined in the library article

Unity開發實作(使用UI按鈕控制)

建立make transition, 右鍵點擊idle選擇make transition會產生可滑動箭頭, 將滑鼠點擊run, 即建立成功。



點擊run後, 會有一個箭頭指向run

Unity開發實作(使用UI按鈕控制)

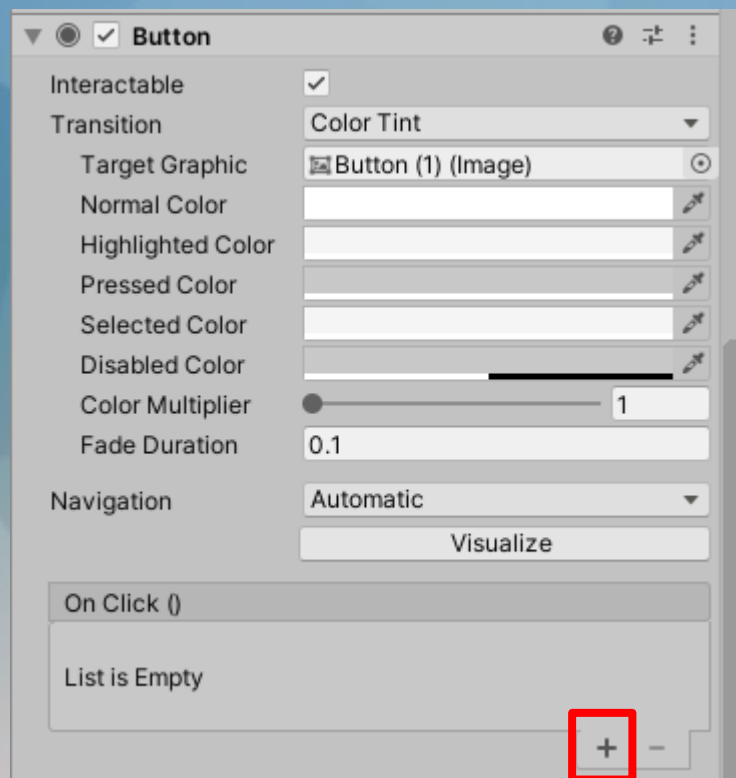
建立程式，參考/UI按鈕/示範

```
using System.Collections;
using System.Collections.Generic;
using UnityEngine;

public class modelbtn : MonoBehaviour
{
    public Animator an;
    public void run() 建立一個呼叫動畫控制器的function
    {
        an.SetTrigger("run");
    }
}
```

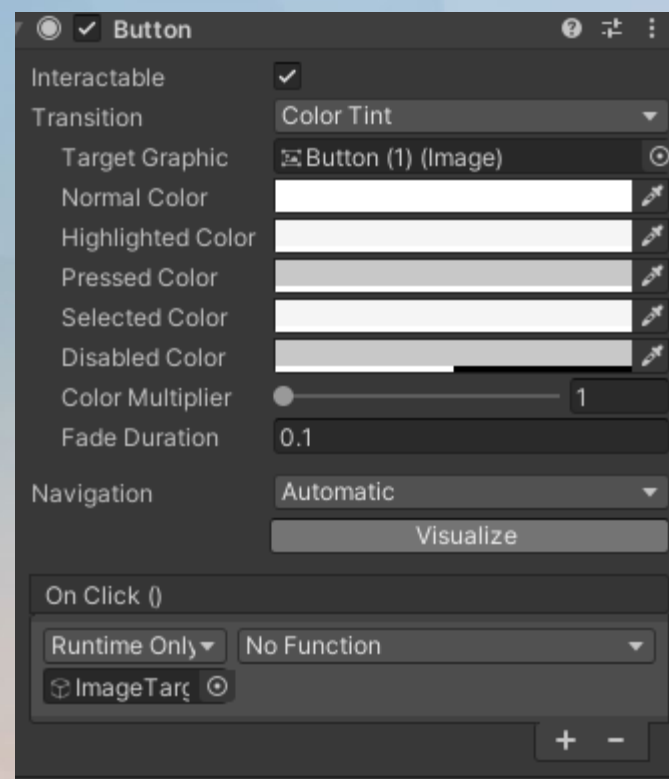
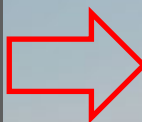
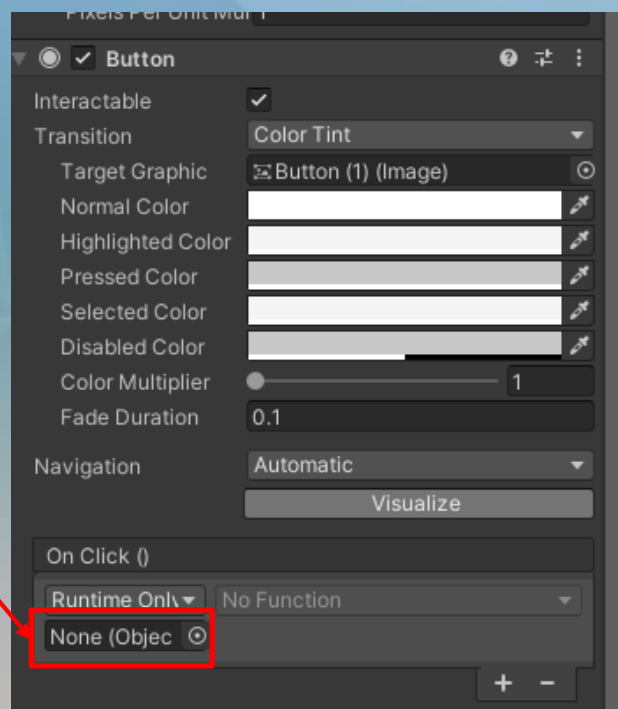
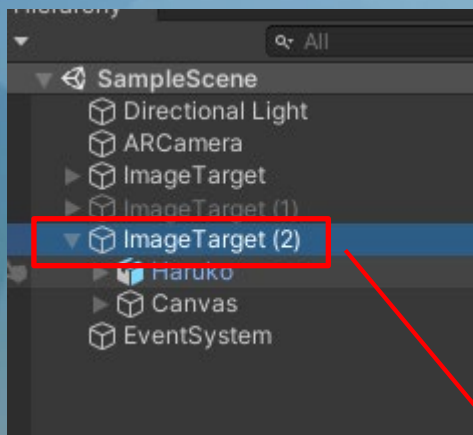
Unity開發實作(使用UI按鈕控制)

按鈕連線



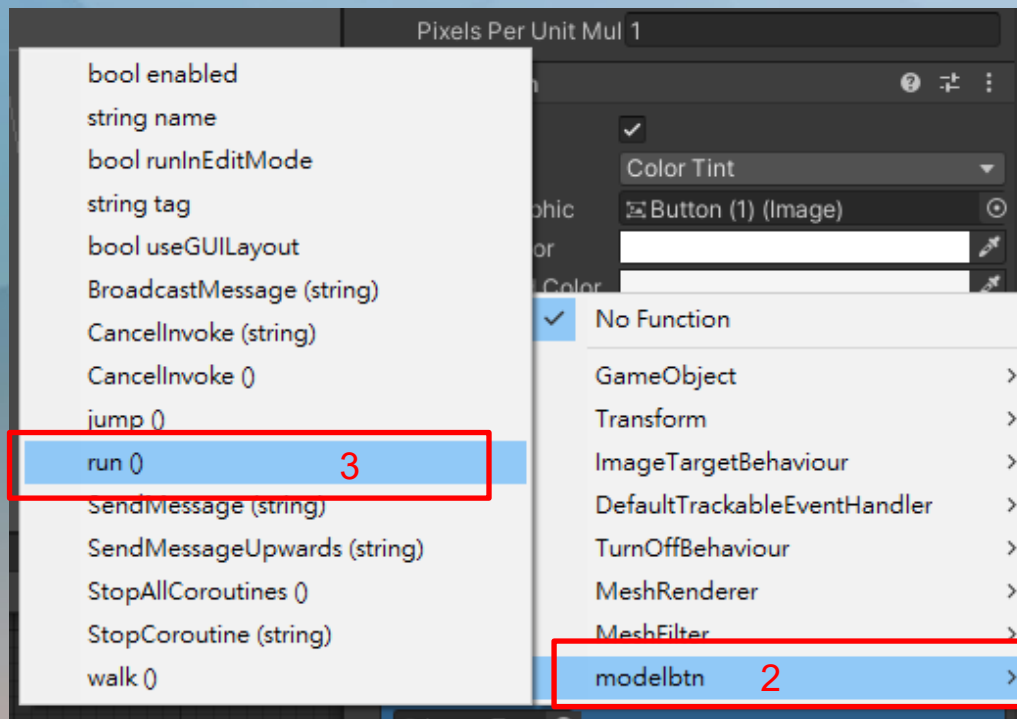
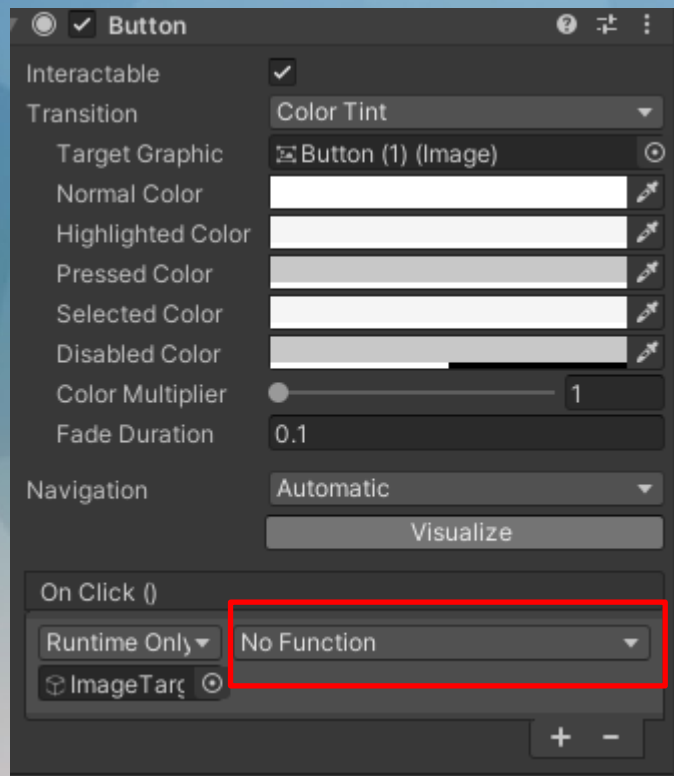
Unity開發實作(使用UI按鈕控制)

按鈕連線



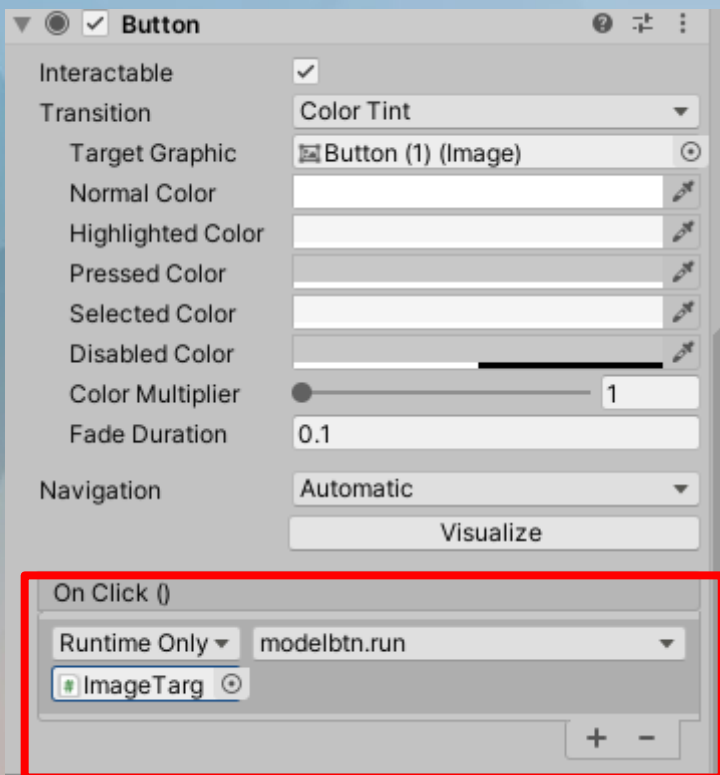
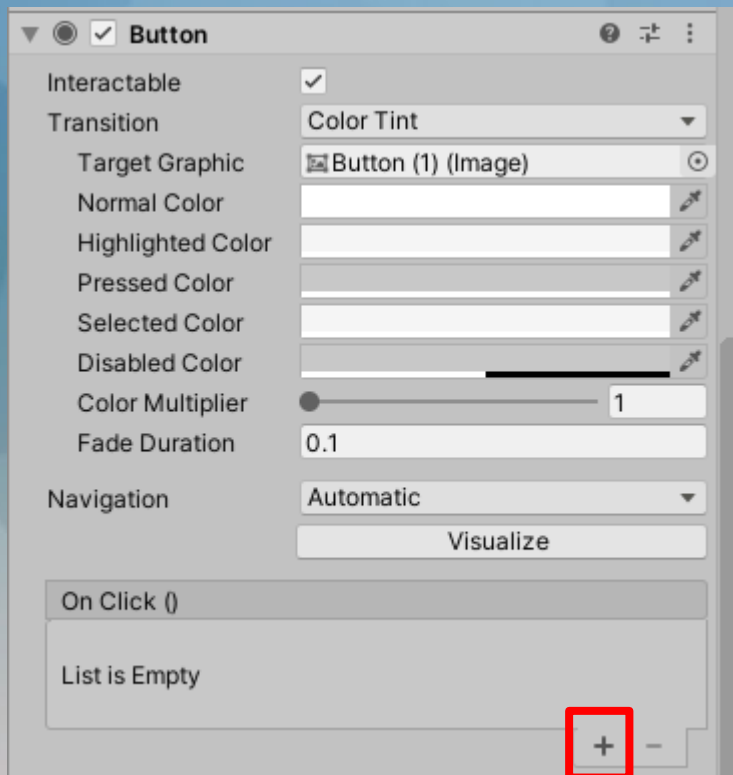
Unity開發實作(使用UI按鈕控制)

點擊no function->程式腳本名稱->run()



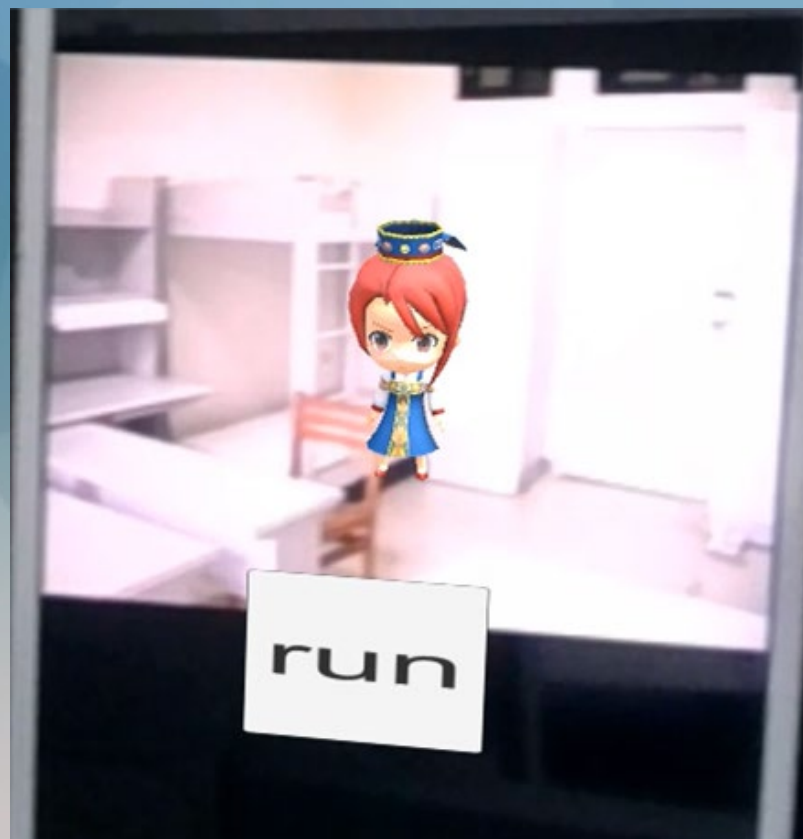
Unity開發實作(使用UI按鈕控制)

按鈕連線



Unity開發實作(使用UI按鈕控制)

實際測試



未按按鈕閒置動畫



按按鈕開始跑步

Unity開發實作(使用UI按鈕控制)

試試看

若我今天想讓模型做其他動作，該怎麼使用呢？

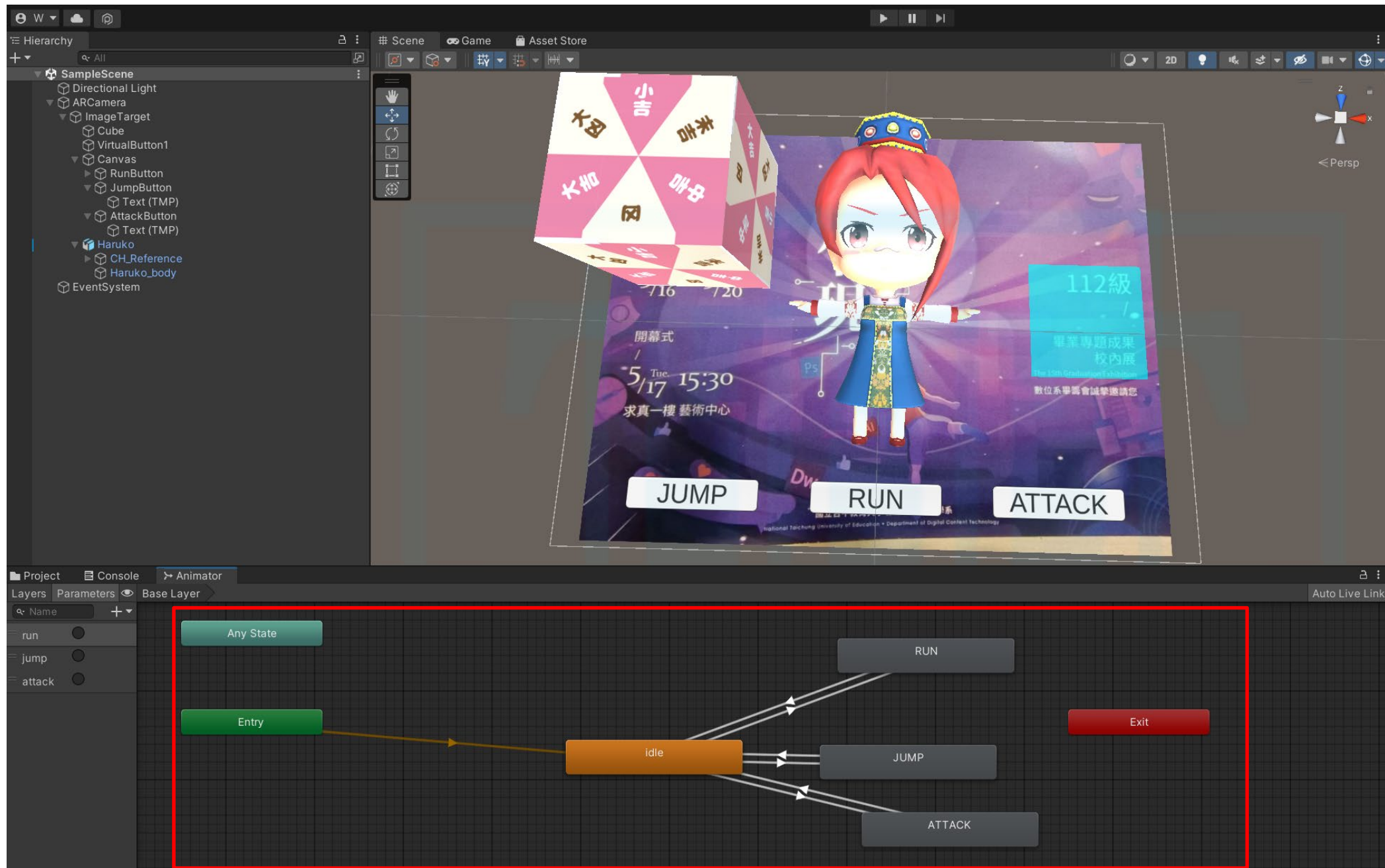


Unity開發實作(使用UI按鈕控制)

今天想讓模型做其他動作，該怎麼使用呢？

```
UIButtonController.cs X
Assets > UIButtonController.cs > UIButtonController > attack()
1  using System.Collections;
2  using System.Collections.Generic;
3  using UnityEngine;
4  using UnityEngine.UI;
5
6  0 references
7  public class UIButtonController : MonoBehaviour
8  {
9      // Start is called before the first frame update
10     3 references
11     public Animator an;
12     0 references
13     public void run()
14     {
15         an.SetTrigger("run");
16     }
17
18     0 references
19     public void jump()
20     {
21         an.SetTrigger("jump");
22     }
23
24     0 references
25     public void attack()
26     {
27         an.SetTrigger("attack");
28     }
29 }
```

完成



參考資源

Vuforia 介紹 - 新手入門指南

https://www.gameislearning.url.tw/article_content.php?getb=39&foog=9997

Vuforia 教學 unity AR 設定流程(以Unity 2021.x版為例)

https://www.gameislearning.url.tw/article_content.php?getb=7&foog=9997

Vuforia 虛擬按鈕(Virtual Button) – AR 互動製作

https://www.gameislearning.url.tw/article_content.php?getb=9&foog=9997

Virtual buttons in AR with Vuforia in Unity3D

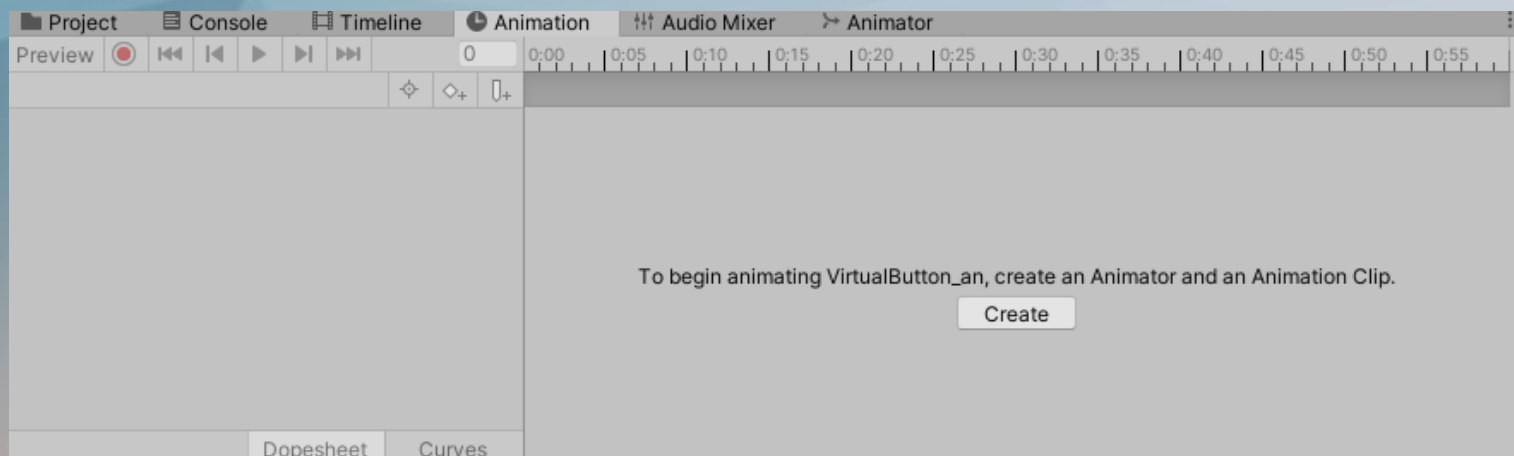
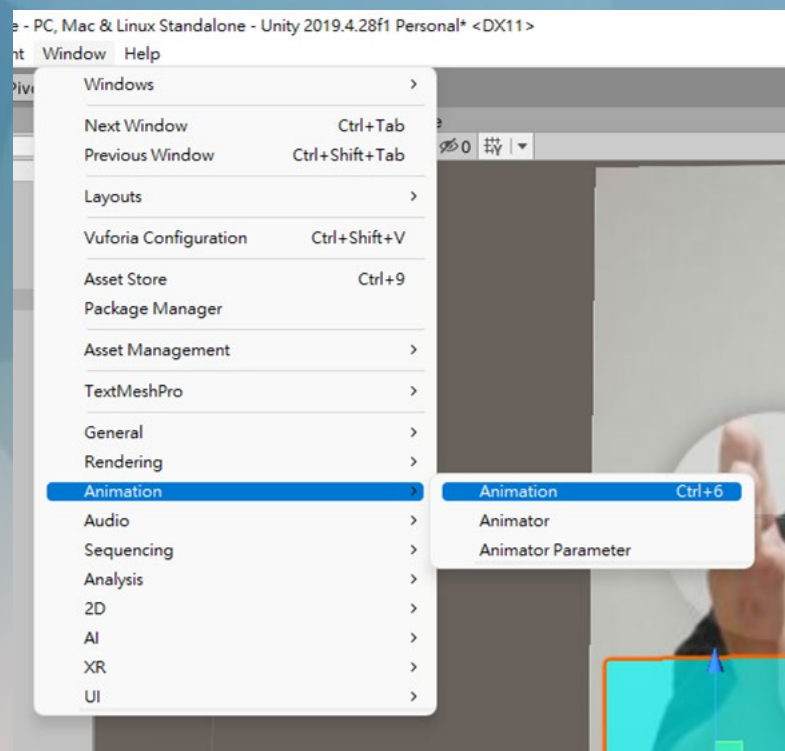
<https://www.youtube.com/watch?v=Ckw4RKKVE3k>

以下投影片為待刪除

Unity開發實作(虛擬按鈕)

動畫製作

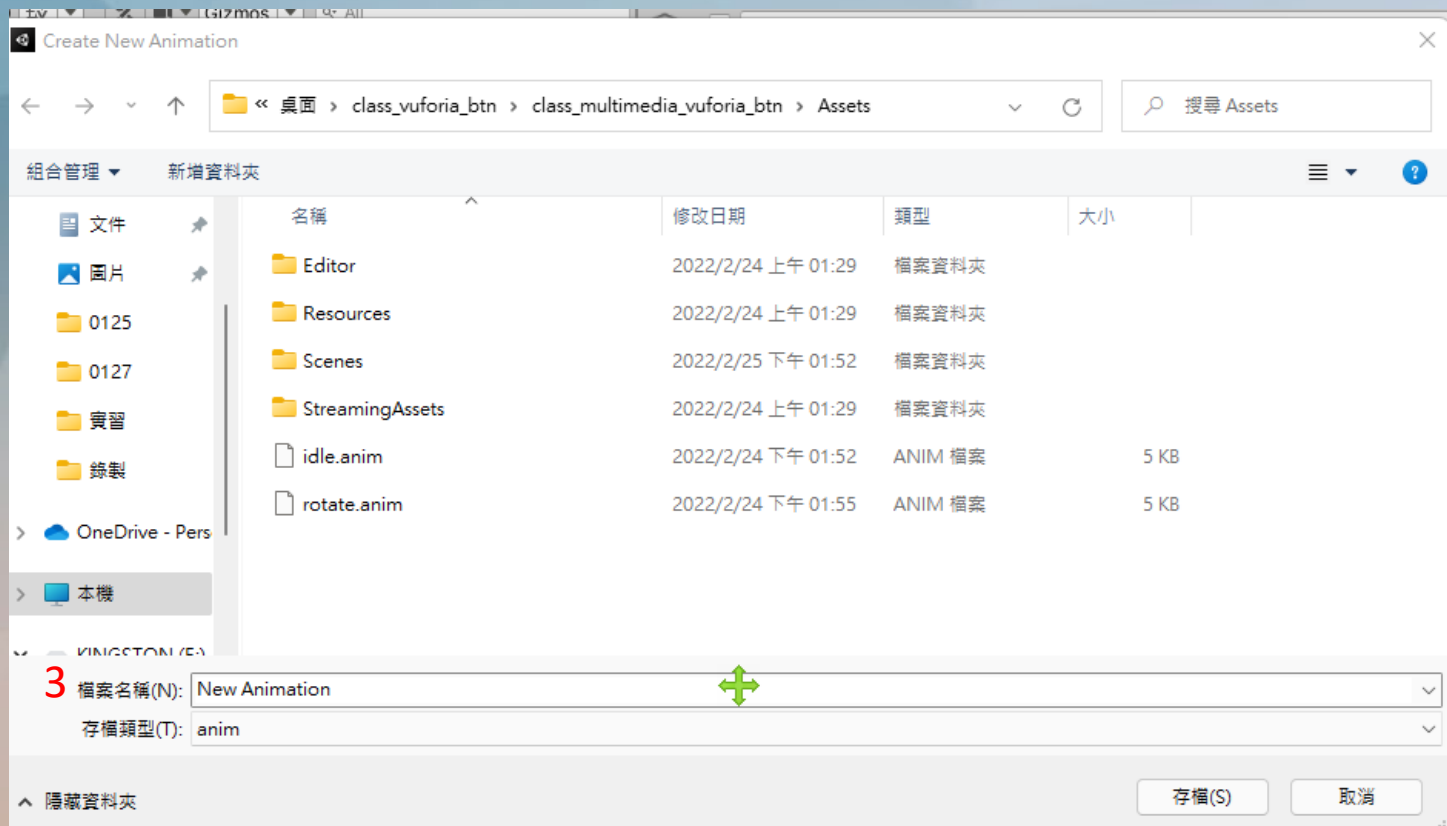
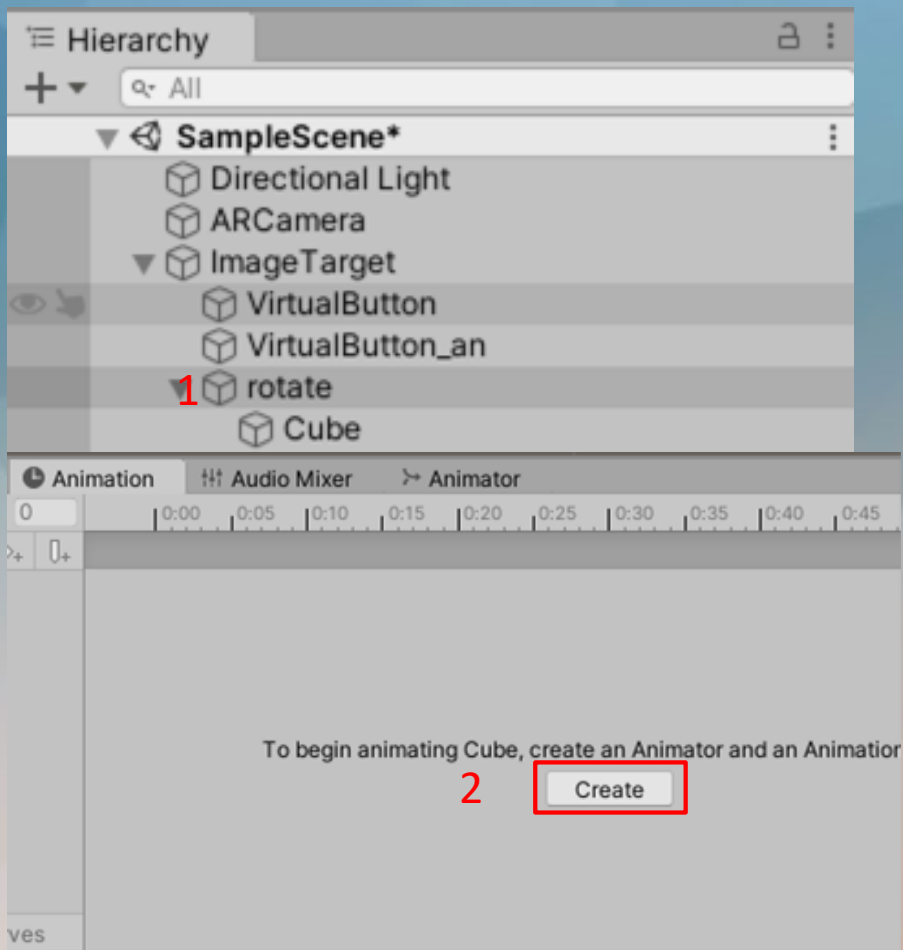
Window->Animation->Animation,呼叫動畫製作視窗



Unity開發實作(虛擬按鈕)

動畫製作

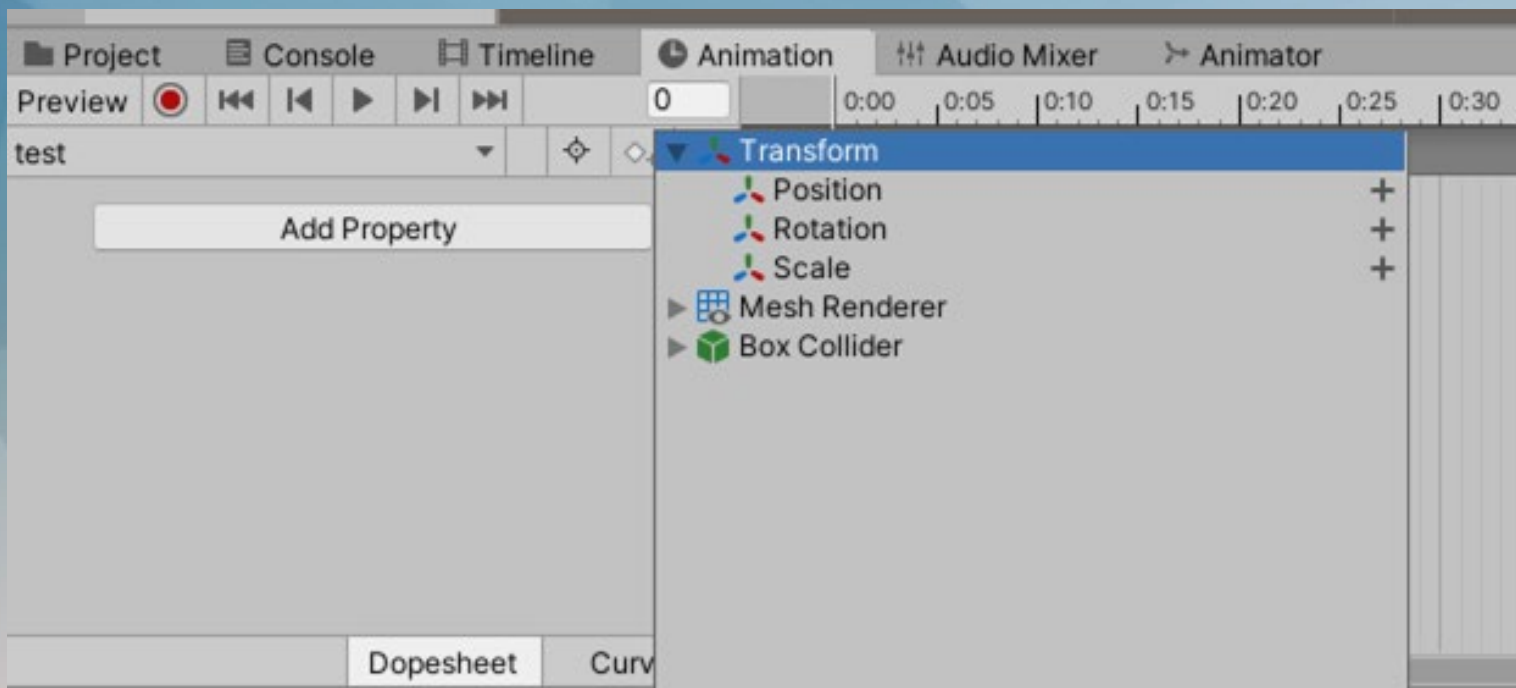
務必先點選模型在按建立動畫



Unity開發實作(虛擬按鈕)

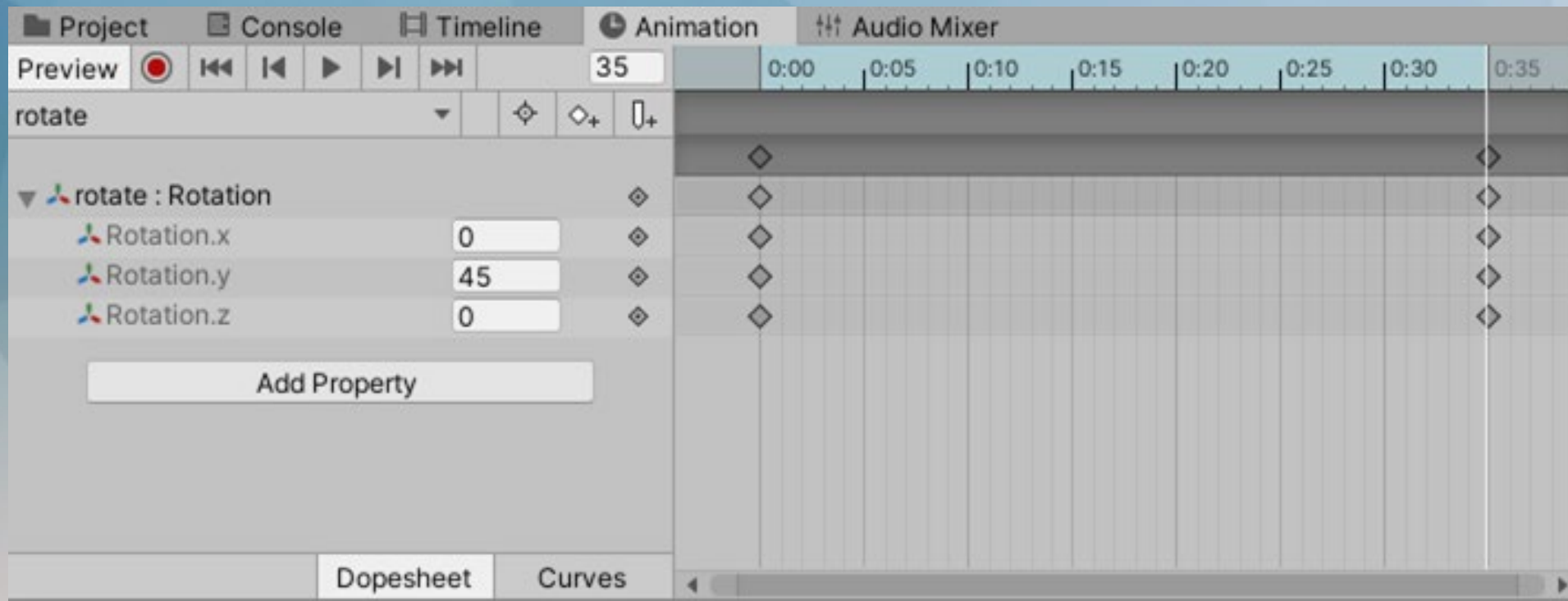
動畫製作

檔案建立後，點選Add Property選擇Transform，以Rotation為示範



Unity開發實作(虛擬按鈕)

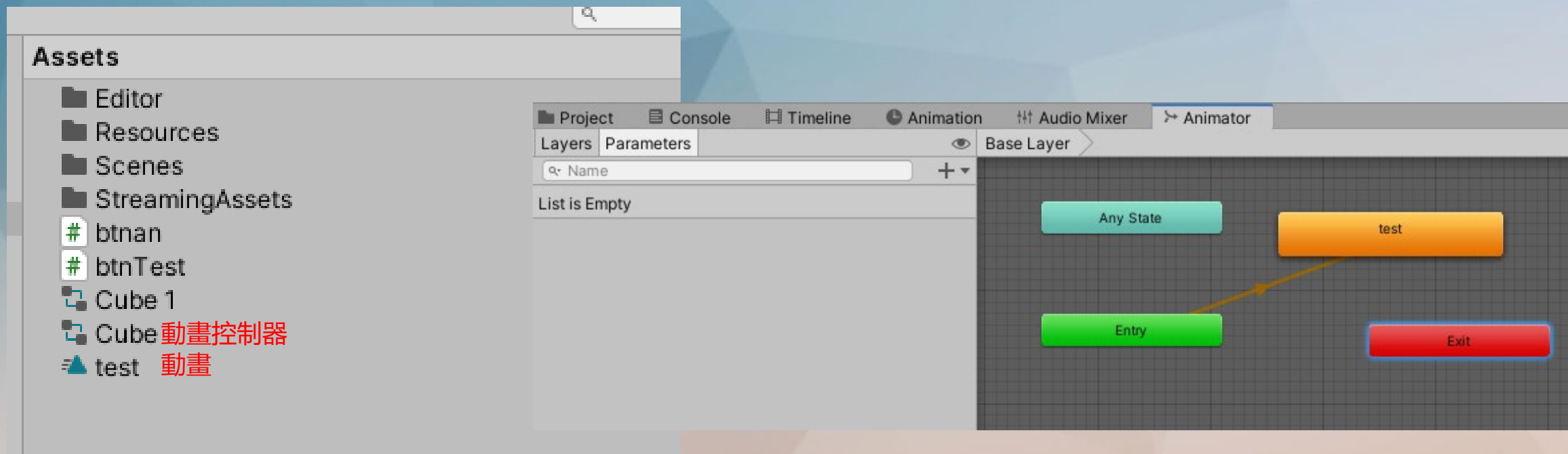
動畫製作



Unity開發實作(虛擬按鈕)

動畫控制器

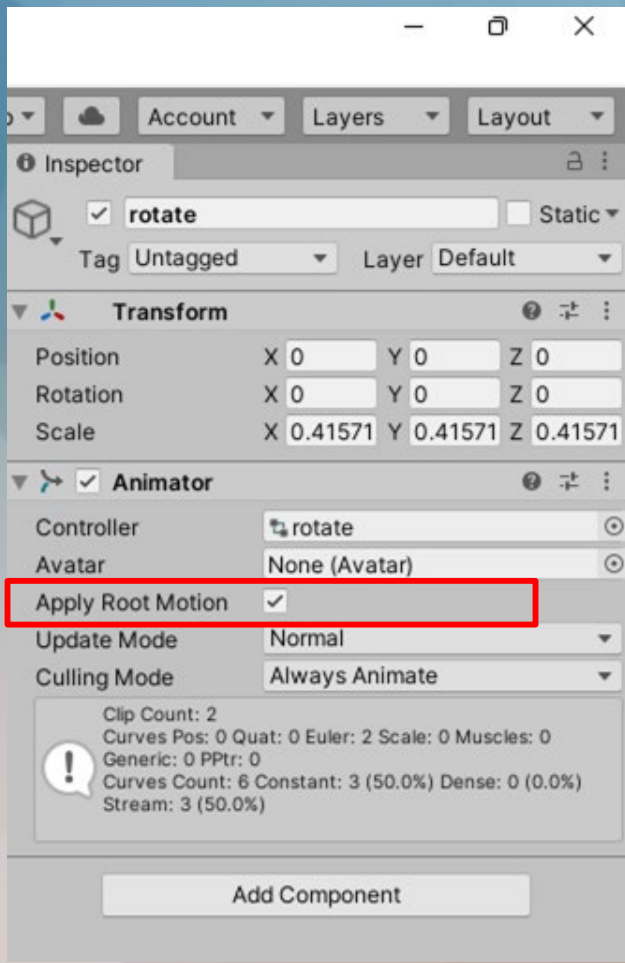
當你製作完動畫後，會發現目錄中同時被新增了一個Cube的檔案，此為動畫控制器，負責動畫切換工作



Unity開發實作(虛擬按鈕)

動畫控制器

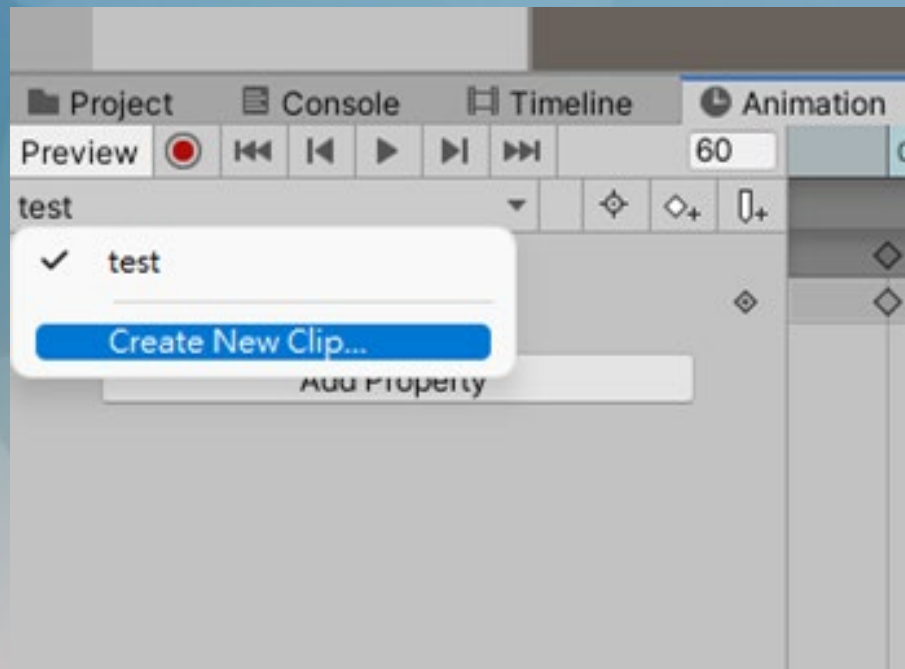
將apply root motion打勾



Unity開發實作(虛擬按鈕)

靜態動畫製作

點選cube動畫檔名旁的引號->create new clip->命名



Unity開發實作(虛擬按鈕)

靜態動畫製作

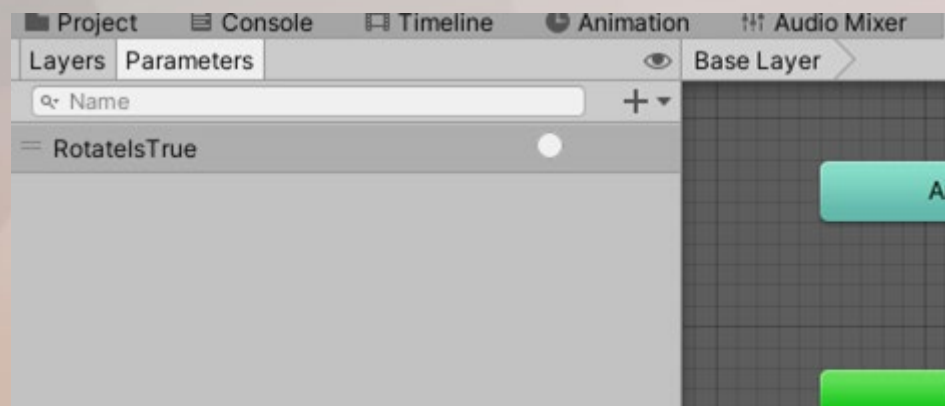
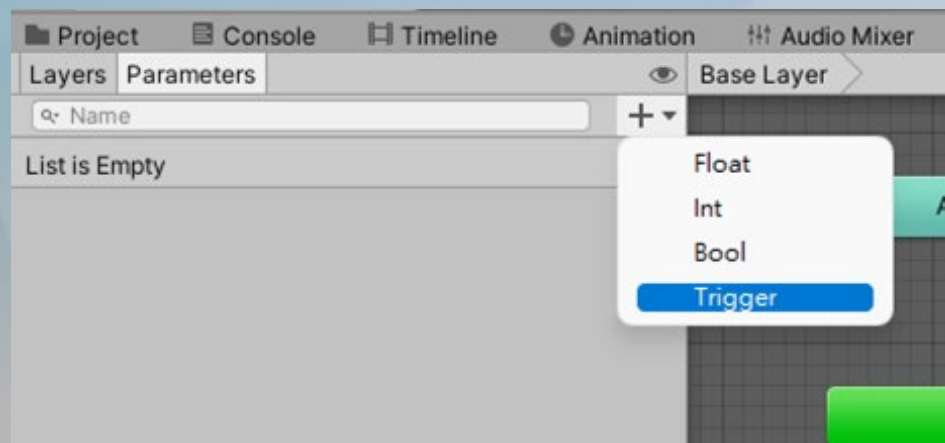
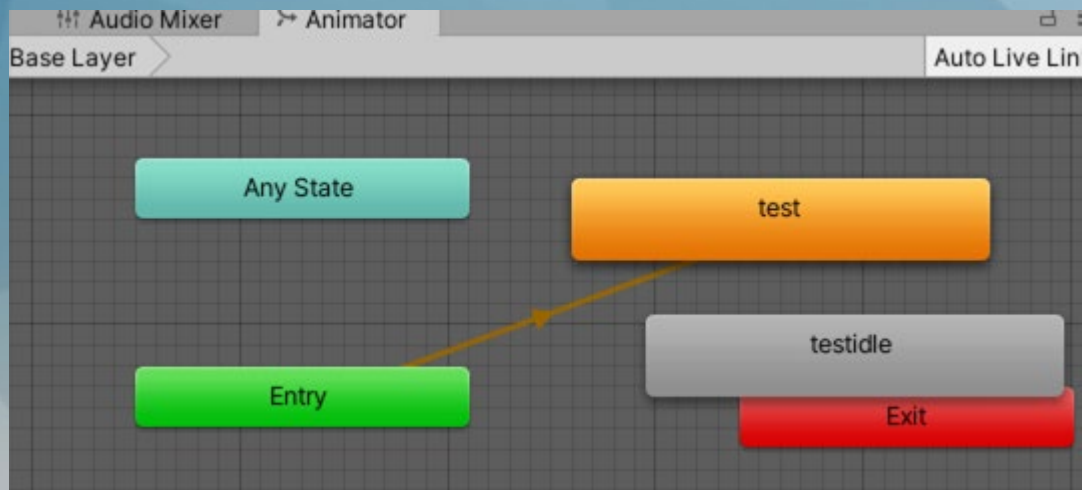
add property到rotation,然而這次我們建立後甚麼都不用動, 因為我們就是要建立一個靜態動畫



Unity開發實作(虛擬按鈕)

動畫控制器

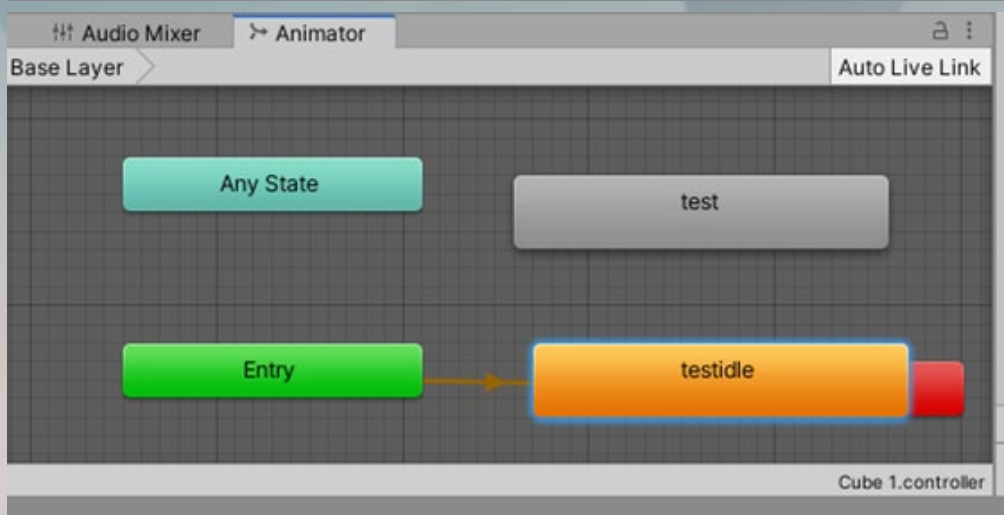
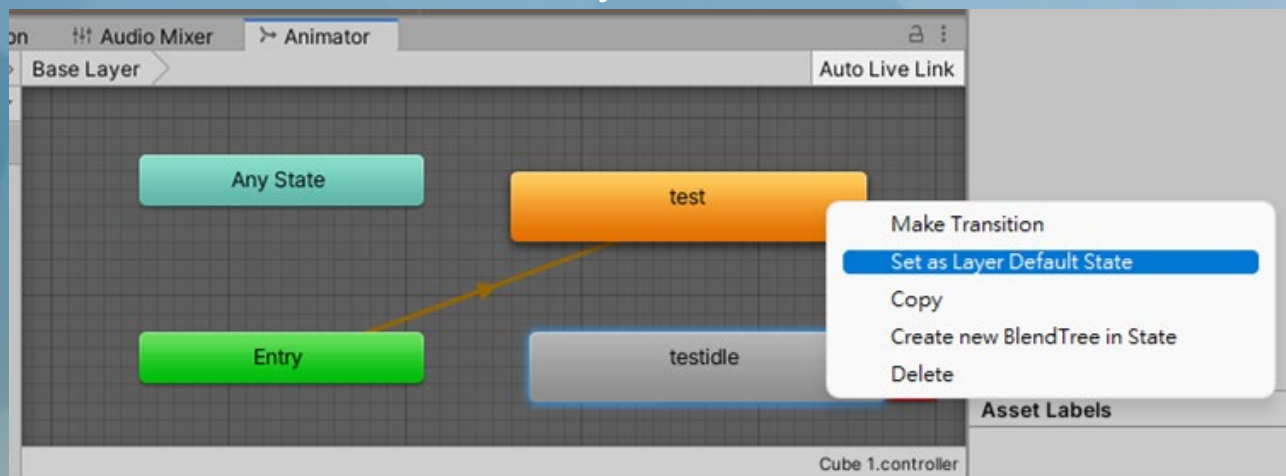
回到動畫控制器，此時會發現兩個動畫都在控制器，接著開始做動畫如何切換的工作，建立一個Trigger變數



Unity開發實作(虛擬按鈕)

動畫控制器

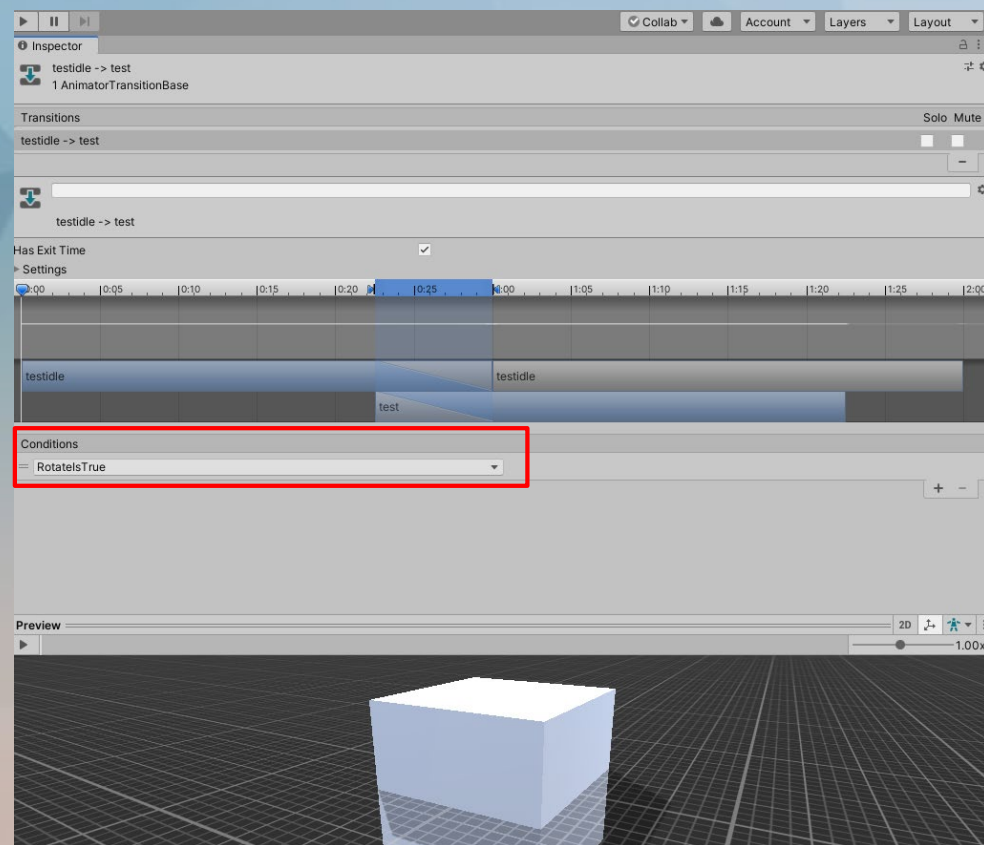
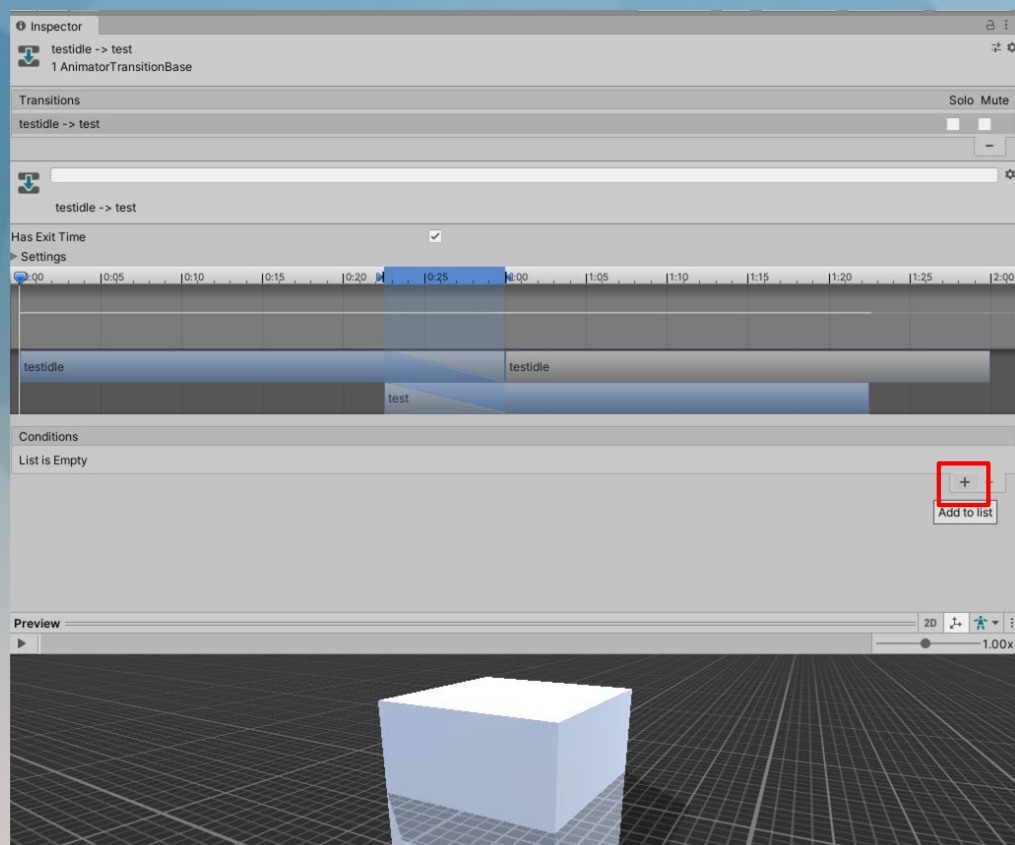
右鍵點選靜態動畫選取set as layer default state



Unity開發實作(虛擬按鈕)

動畫控制器

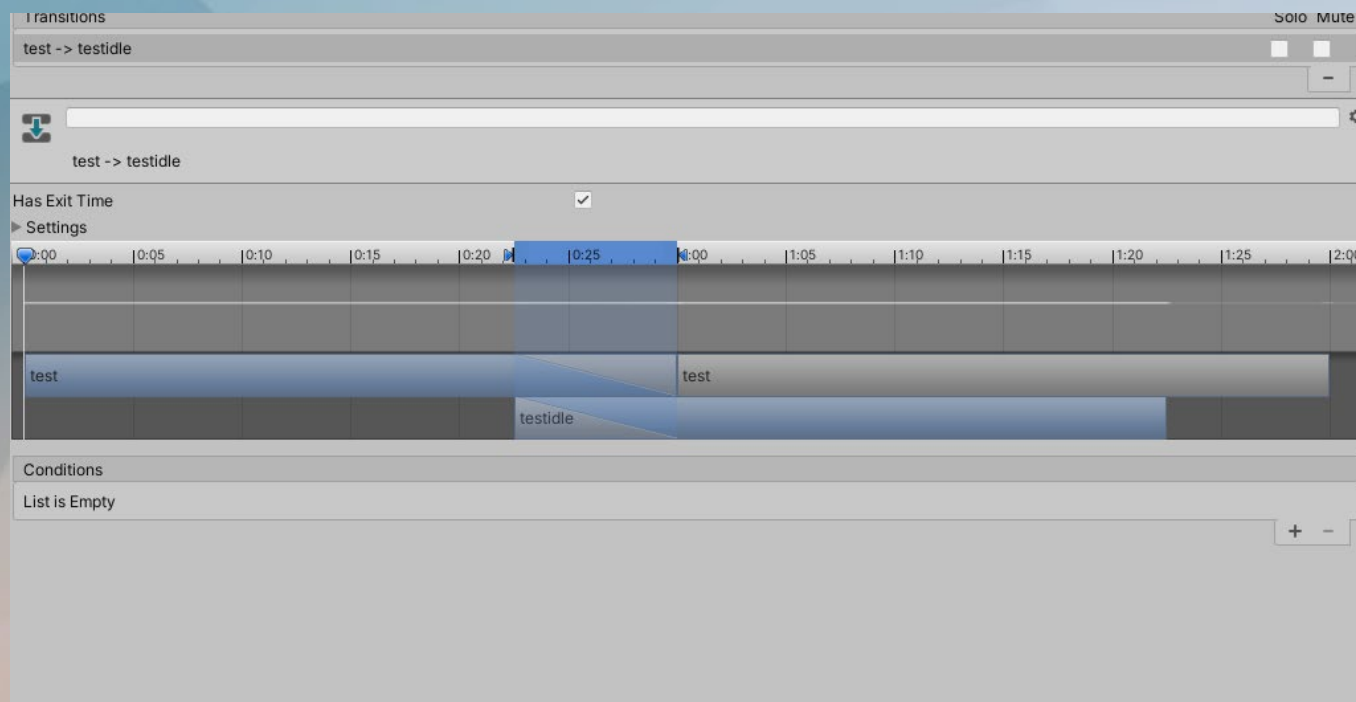
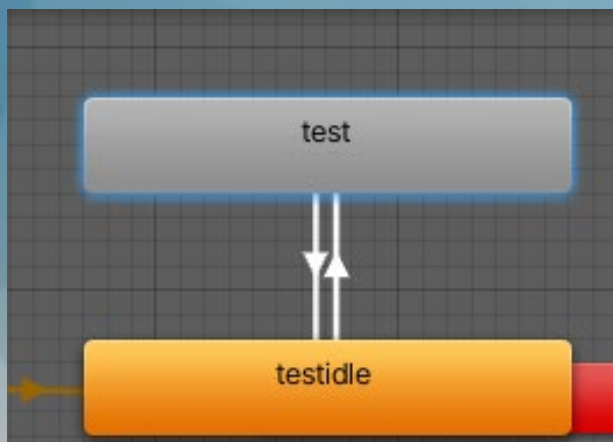
點選箭頭後，於condition建立切換事件，選擇之前創建的trigger變數



Unity開發實作(虛擬按鈕)

動畫控制器

現在有靜態到動態的工作了，那動態到靜態呢?只要一樣右鍵動態動畫make transition指向靜態動畫就好囉



注意!這邊condition就不用使用trigger了!

Unity開發實作(虛擬按鈕)

動畫控制器

將靜態到動態的**Has Exit Time** 取消勾選，動到靜不需要!

