



# QCAR 擴增實境基礎教學



幻覺?!

魔術?!

便秘?!

催眠?!



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# 擴增實境辨識/顯示方式

辨識方式

使用特定圖形標記進行影像辨識

使用實際景物  
影像辨識

使用GPS、RFID  
與電子羅盤定位

顯示方式

以螢幕呈現

頭戴式的視訊  
顯示方式

頭戴式的光學顯  
示方式



特定圖形標記



真實環境影像



定位技術

# QCAR 軟體需求(for Unity 3D)

- ◎ QCAR套件 [vuforia-unity-android-1-5-10.exe](#)(免費)
  - > 此套件為擴增實境的程式模組
  - > <https://ar.qualcomm.at/qdevnet/sdk/android>
- ◎ 圖形化開發軟體 [Unity 3D](#) (基本版免費、專業版3萬)
  - > 圖形化開發環境，能夠製作更複雜的擴增實境場景與數位內容，並且支援輸出到手機(Android / ios)
  - > <http://unity3d.com/>
- ◎ [Android-sdk-windows](#) (免費)
  - > 需安裝Android2.2以上版本

# QCAR 製作流程

- 上傳辨識影像至QCAR服務伺服器，轉成擴增實境追蹤物件
- 準備開發環境，將QCAR套件匯入開發環境中，進行擴增實境專案開發
- 將擴增實境專案以手機應用程式安裝檔匯出
- 在行動裝置進行apk安裝、並且執行

# 1.1 新增辨識影像專案

Qualcomm vuforia

Step1. 帳號登入

Hello, airstanair → MY ACCOUNT Log Out

Home SDK Dev Guide API Forums My Trackables Help

My Trackables » AR My Trackables

Step2. 點選 My Trackables

New Project Step3. 新增專案

bufferfly homework scu\_ar

6 Trackables Created : Dec 04, 2012 Last Modified : Dec 04, 2012

bles Apr 06, 2012 ified : Dec 09, 2012

New Project

Project name: \*

Save

Step4. 命名、送出

註: <https://ar.qualcomm.at/qdevnet/sdk/android>  
欲使用系統功能，需註冊帳戶

# 1.2 選擇專案類型

Create a trackable the

Step1. 建立追蹤物件

Rename Project

Delete Project

Back

## Create Trackable

Trackable Name: \*

Select Trackable Type: \*



Trackable Scene Size: ⓘ

Enter the desired width of your trackable. The trackable's height will be calculated automatically when you upload your image.

Width:

+ Create Trackabl

Step2. 選擇追蹤物件類型、大小

# 1.3 上傳影像檔案

My Trackables » homework » money » AR 2-D Trackable

Download Trackable Data

Rename Trackable

Delete Trackable

## Upload Image

Choose Image:

選擇檔案 未選擇檔案

File must be **JPG** or **PNG** and should be under 2 MB. Image name must be unique to a project; less than 25 characters; may only contain letters, numbers, and the underscore '\_'. When a trackable is detected in your application, this name will be used for reference.

+ Done

Step1. 點擊上傳

Upload

Width: 30

Step2. 選擇檔案並上傳



# 1.4 上傳結果

My Trackables » homework » money » Trackable » AR Trackable Details

Hide Features

Replace Image Delete Image

☆☆☆☆☆  
This image provides good tracking performance



註:系統會給予上傳的影像進行評價，滿分5顆星，經過測試3顆星的影像就有不錯的效果



# 1.5 下載追蹤物件檔案

My Trackables » homework » money » AR 2-D Trackable

Step1. 回到上一層路徑

Download Trackable Data

Step2. 下載追蹤物件檔案

Rename Trackable Delete Trackable

**Trackable Assets Package Download**

Select a format to match your development option:

- SDK (Eclipse, Ant, Xcode, etc...)
- Unity Editor

Trackable assets name: ⓘ

homework .unitypackage

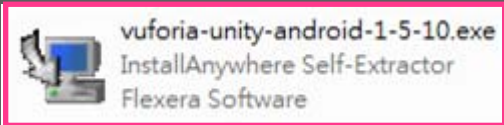
Next

Step3. 選擇Unity Editor並下載

homework.unity package

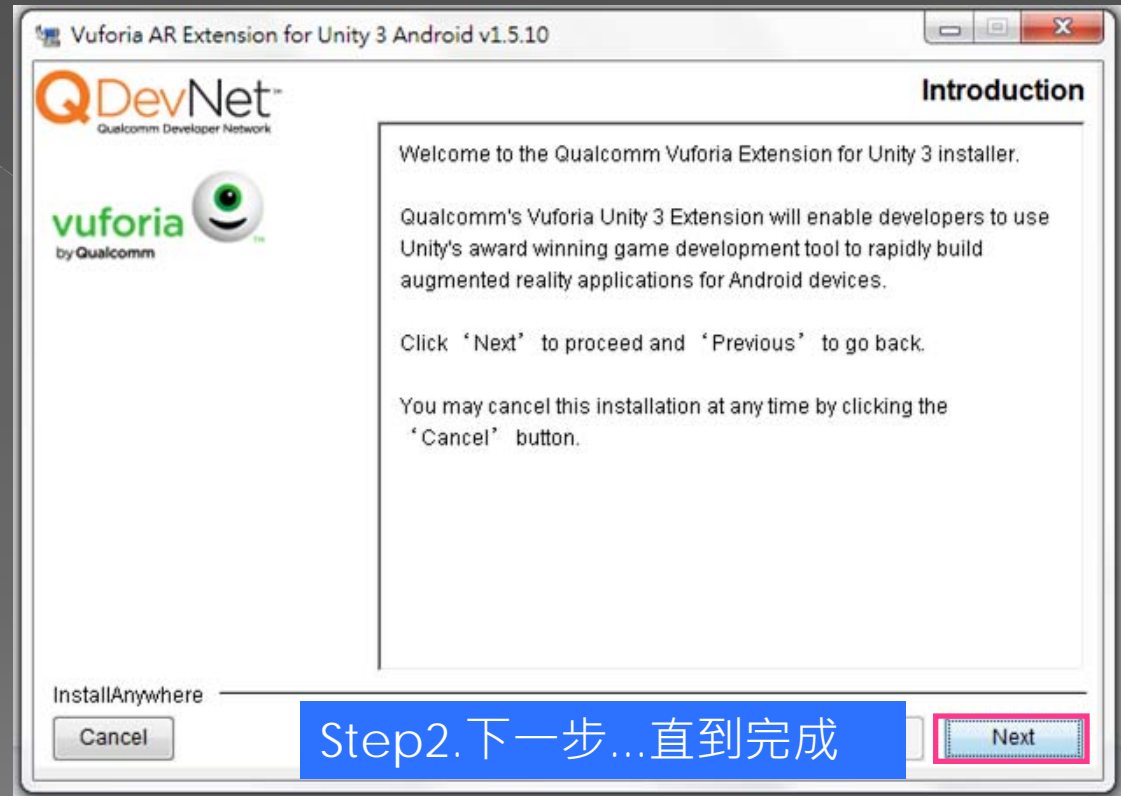
註: 下載後長這樣

# 安裝套件

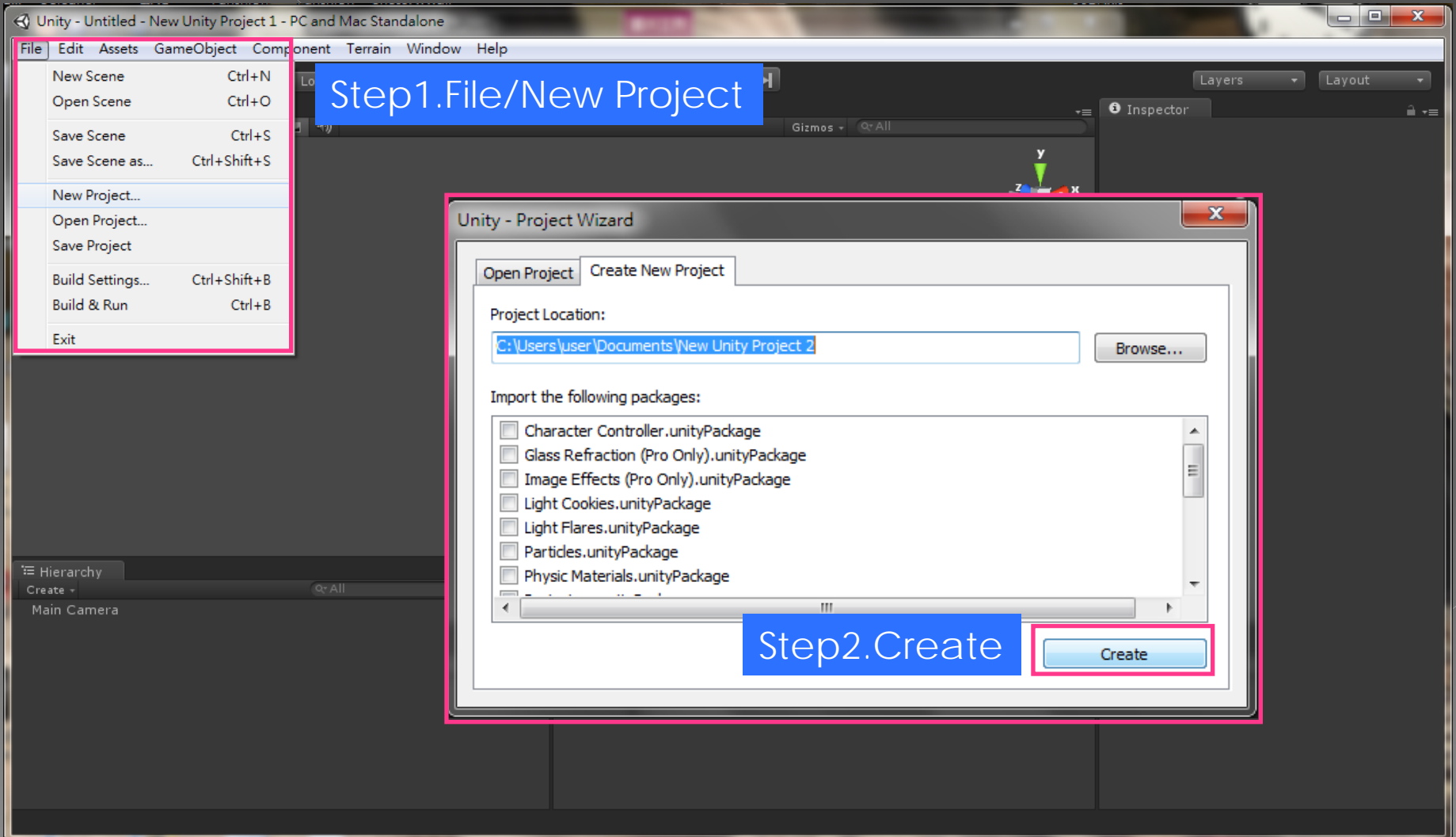


Step1. 安裝QCAR套件

註: 下載網址請看p3










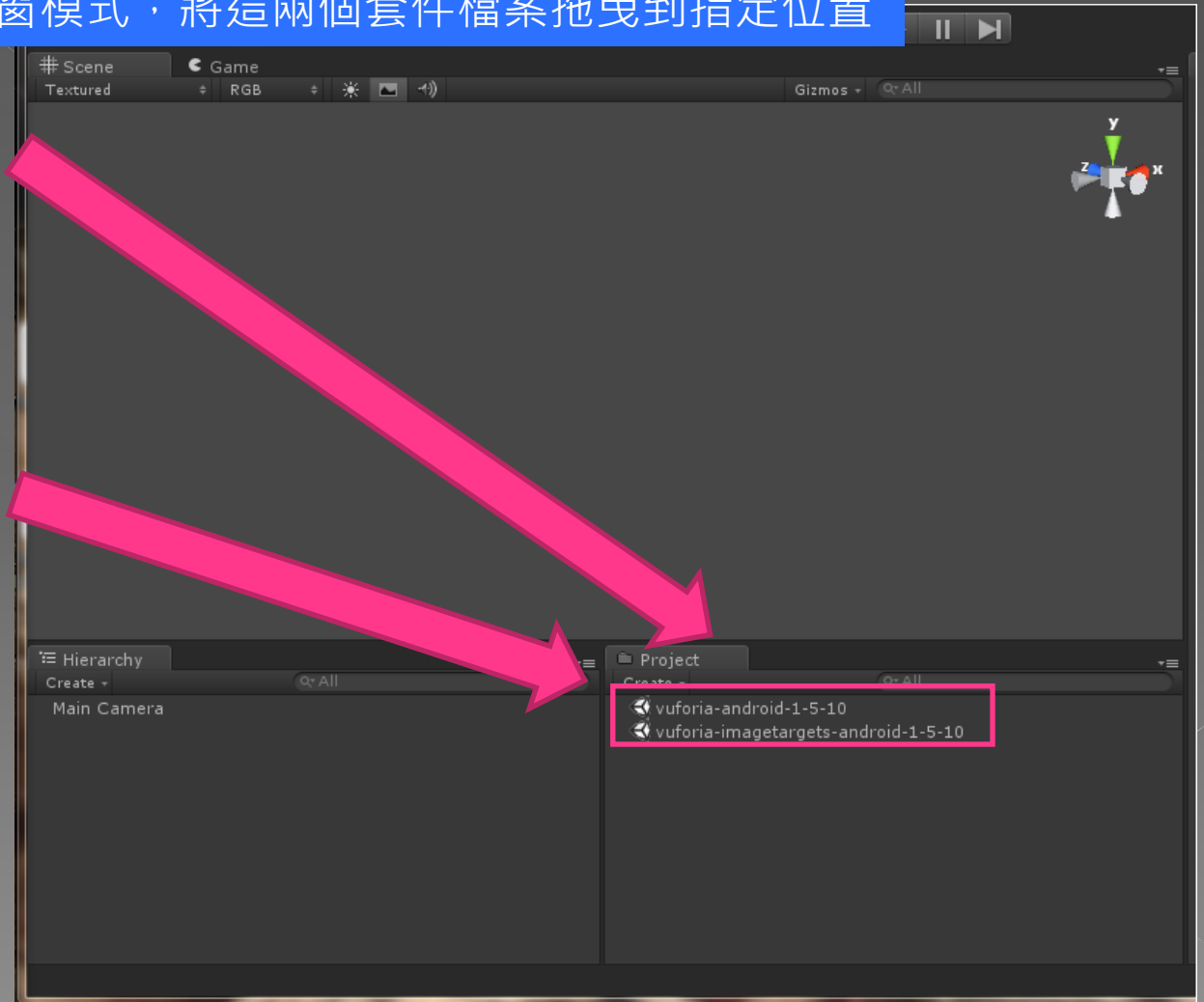
# 2.1 新增Unity 3D 專案



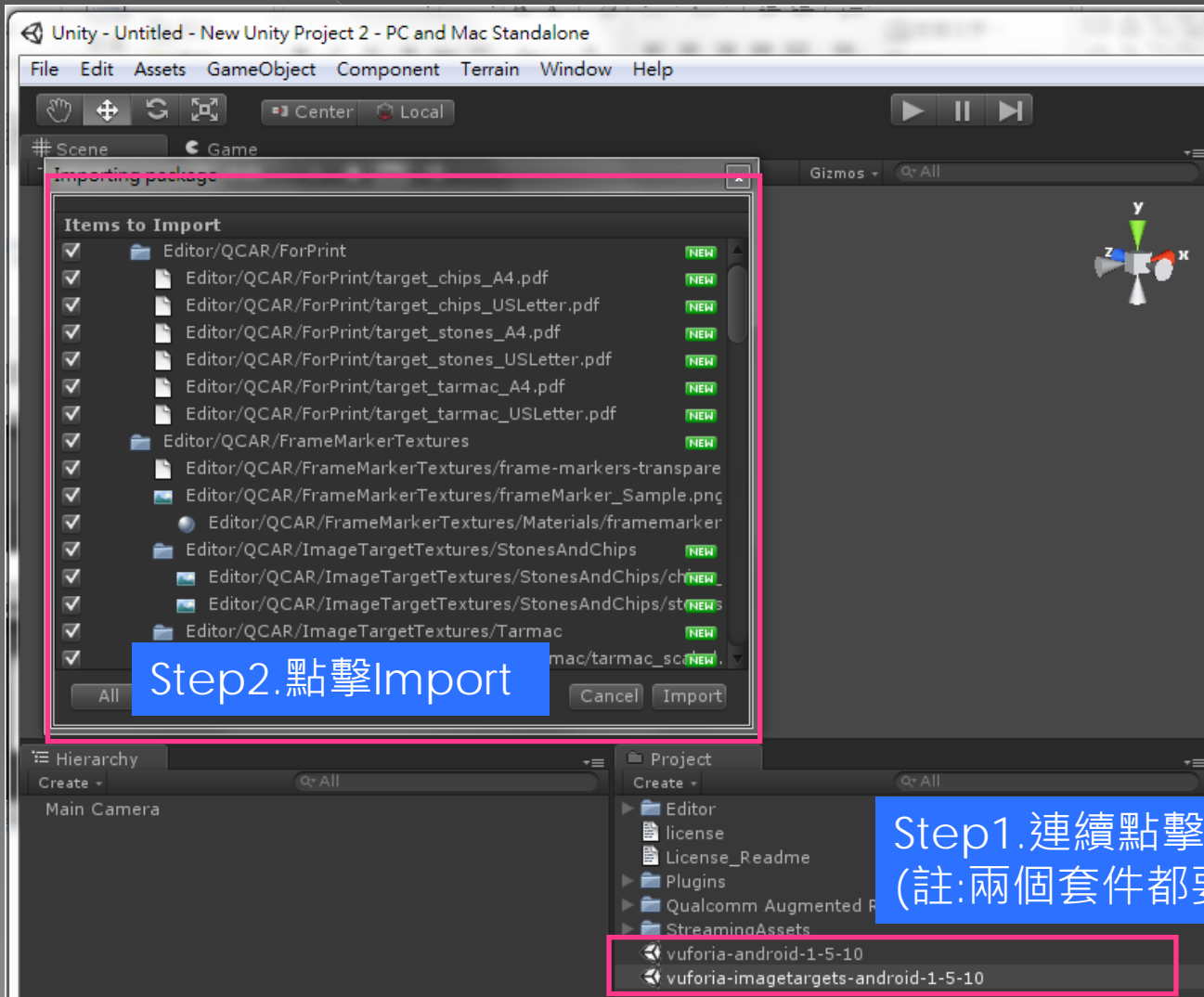
# 2.2加入QCAR套件

Step1.利用win7多視窗模式，將這兩個套件檔案拖曳到指定位置

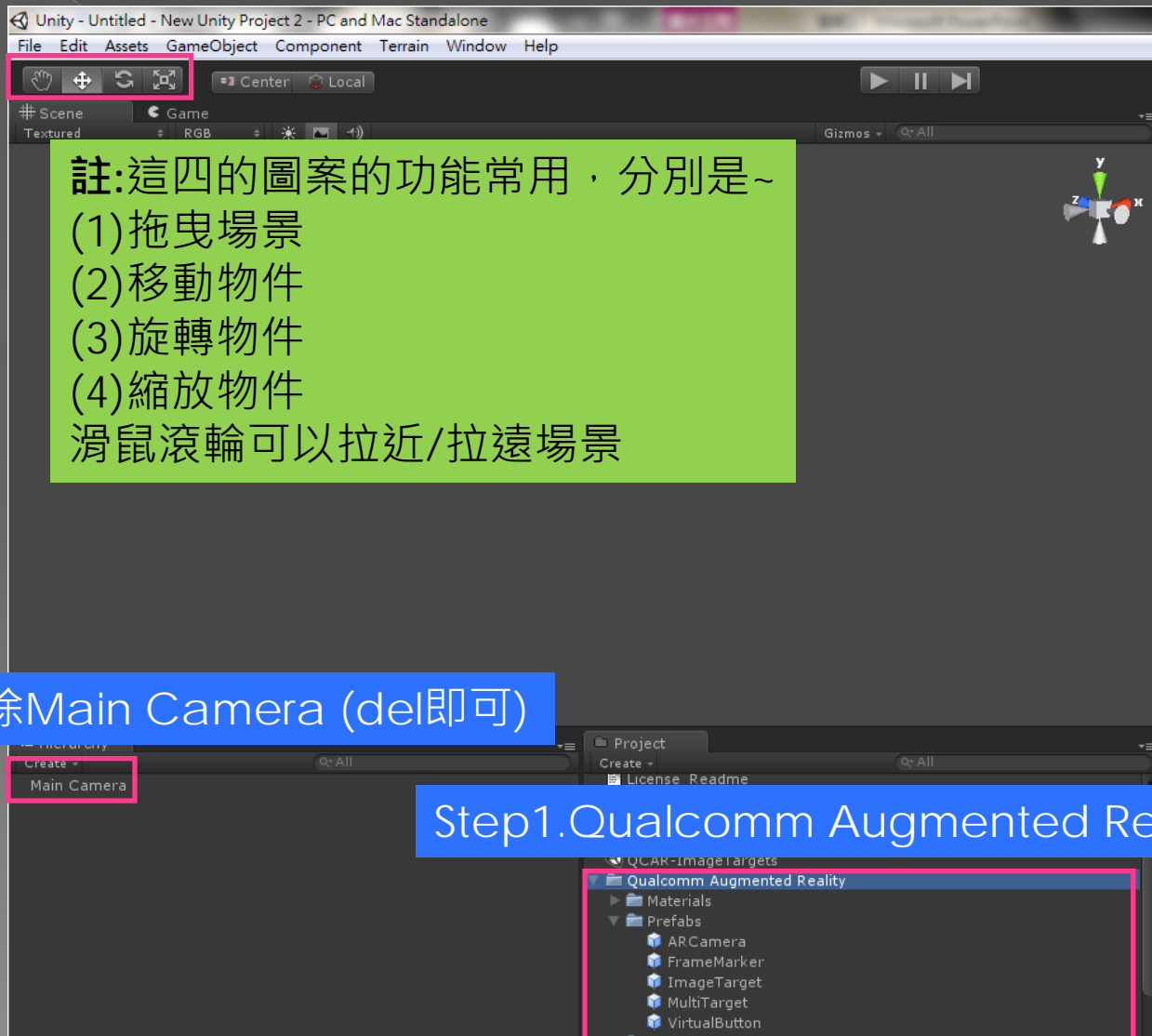
-  vuforia-android-1-5-10.unitypackage  
Unity package file
-  vuforia-backgroundtextureaccess-android-1-5-10.unitypackage  
Unity package file
-  vuforia-framemarkers-android-1-5-10.unitypackage  
Unity package file
-  vuforia-imagetargets-android-1-5-10.unitypackage  
Unity package file
-  vuforia-multitargets-android-1-5-10.unitypackage  
Unity package file
-  vuforia-occlusionmanagement-android-1-5-10.unitypackage  
Unity package file
-  vuforia-virtualbuttons-android-1-5-10.unitypackage  
Unity package file



## 2.3 匯入QCAR套件



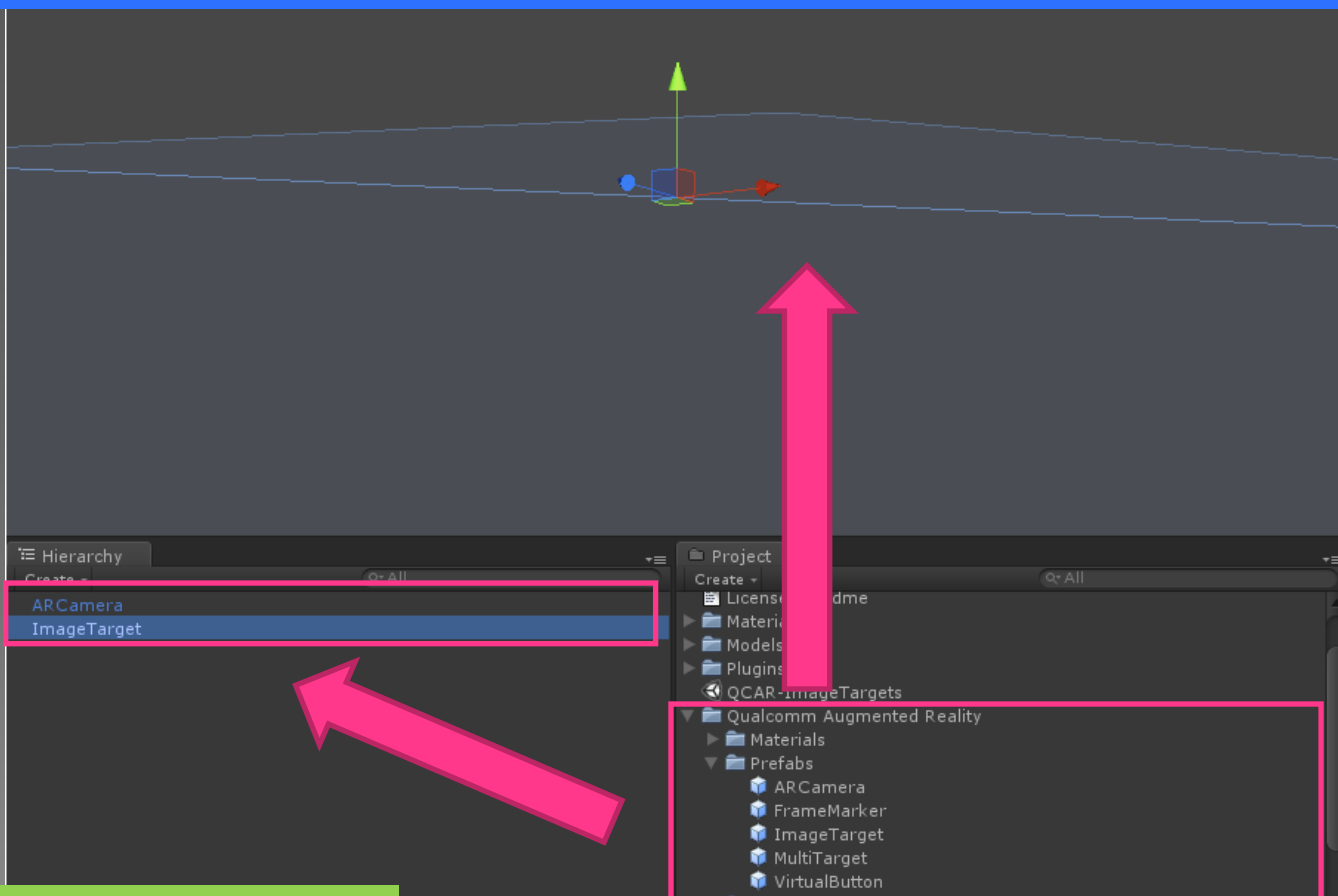
## 2.4環境準備





## 2.5.1 建立物件、視角

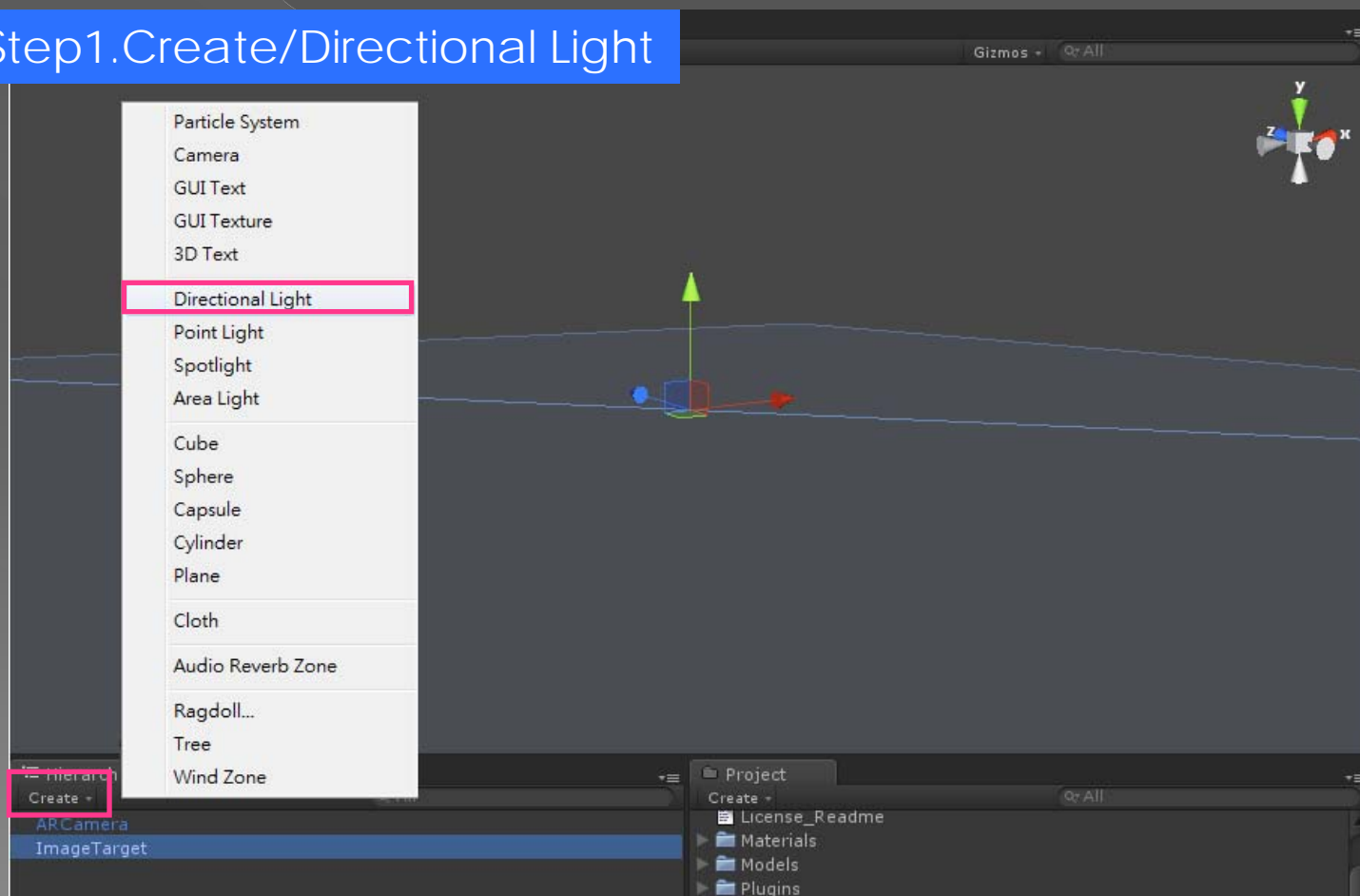
Step1. 將AR Camera 與 ImageTarget 拉入場景”或”拉入左邊式窗



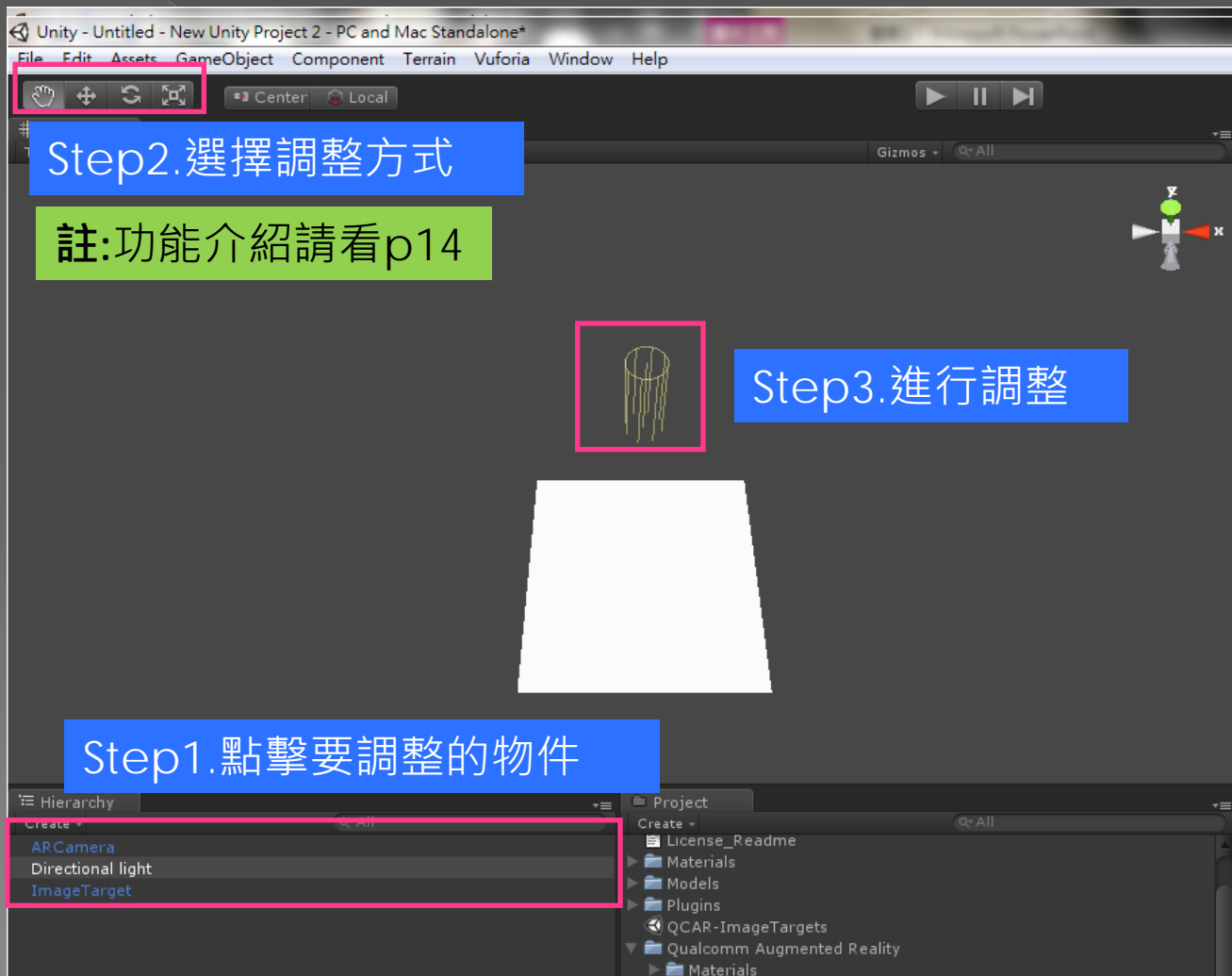
註:左邊視窗即為場景的物件

## 2.5.2 新增燈光

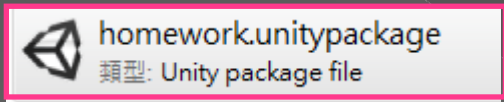
Step1. Create/Directional Light



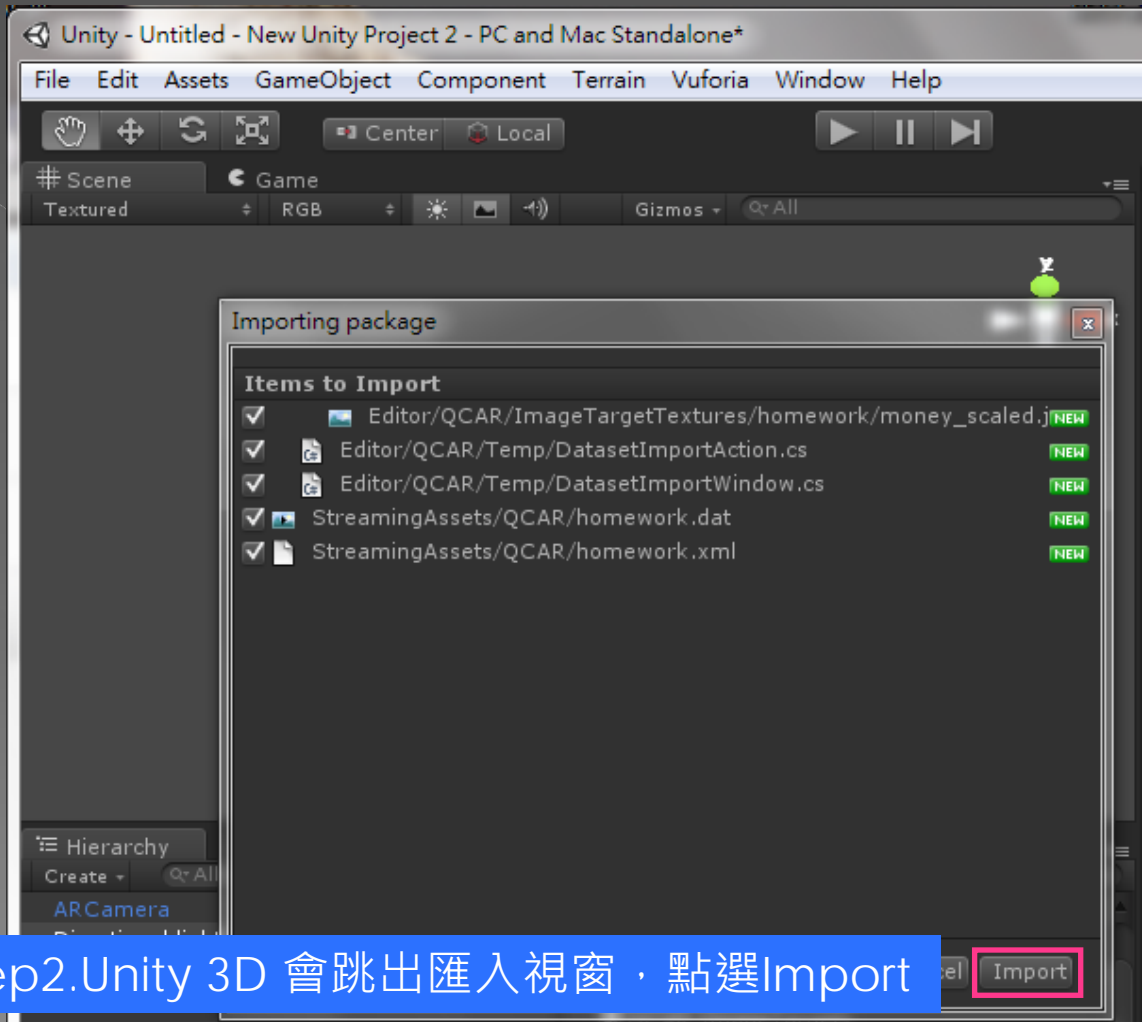
# 2.5.3調整視角、燈光



# 2.6加入追蹤物件

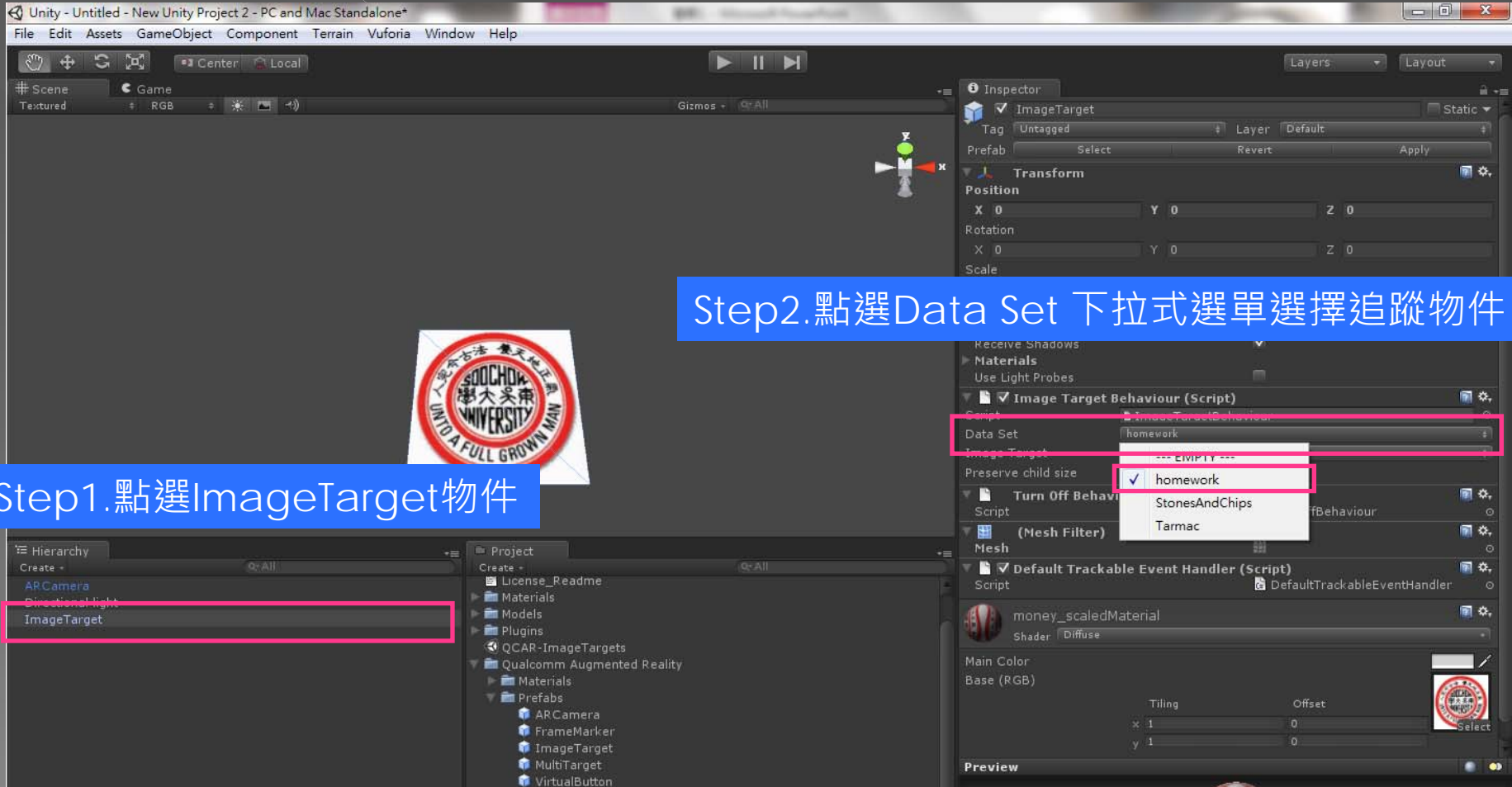


Step1.我們從QCAR服務  
伺服器所下載的追蹤物  
件，  
直接對檔案拖放進Unity  
註:詳情請看p9



Step2.Unity 3D 會跳出匯入視窗，點選Import

# 2.7.1 物件設定(ImageTarget)



# 2.7.2物件設定(ARCamera)

Unity - Untitled - New Unity Project 2 - PC and Mac Standalone\*

File Edit Assets GameObject Component Terrain Vuforia Window Help

Scene Game Textured RGB Gizmos All

Inspector

Position  
X -21.32208 Y 260.264 Z -9.236598  
Rotation  
X 86.37079 Y 54.90741 Z 55.69095  
Scale  
X 1 Y 1 Z 1

Camera  
Clear Flags Solid Color  
Background  
Culling Mask Everything  
Projection Perspective  
Field of View 51.27  
Clipping Planes  
Near 2 Far 5000  
Normalized View Port Rect  
X 0 Y 0  
W 1 H 1  
Depth 1  
Rendering Path Use Player Settings  
Target Texture None (Render Texture)  
HDR

GUI Layer  
Flare Layer  
Audio Listener  
QCARBehaviour (Script)  
Script OCARBehaviour

Script Data Set Load Behaviour  
Activate Data Set homework  
Load Data Set homework   
Load Data Set StonesAnd  
Load Data Set StonesAnd

Hierarchy  
Create -  
ARCamera  
Directional light  
ImageTarget

Project  
Create -  
License\_Readme  
Materials  
Models  
Plugins  
QCAR-ImageTargets  
Qualcomm Augmented Reality  
Materials  
Prefabs  
ARCamera  
FrameMarker  
ImageTarget  
MultiTarget  
VirtualButton  
Scripts  
Shaders  
Scripts  
StreamingAssets  
Textures

QCAR Version: QCAR\_1\_5

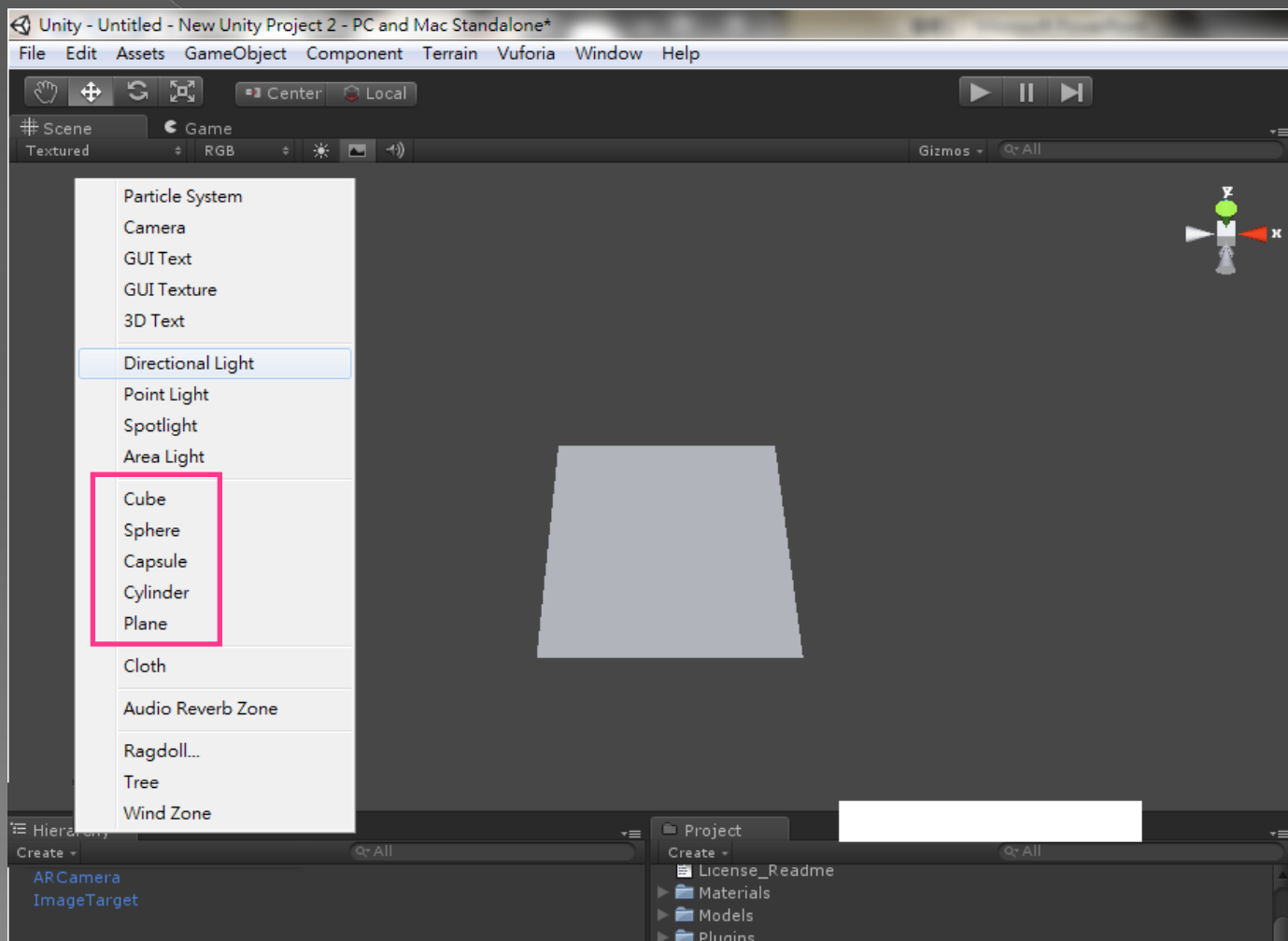
Step1. 點選ARCamera物件

Step2. 點選Activate Data Set  
下拉式選單選擇追蹤物件

Step3. 勾選Load Data set 追蹤物件



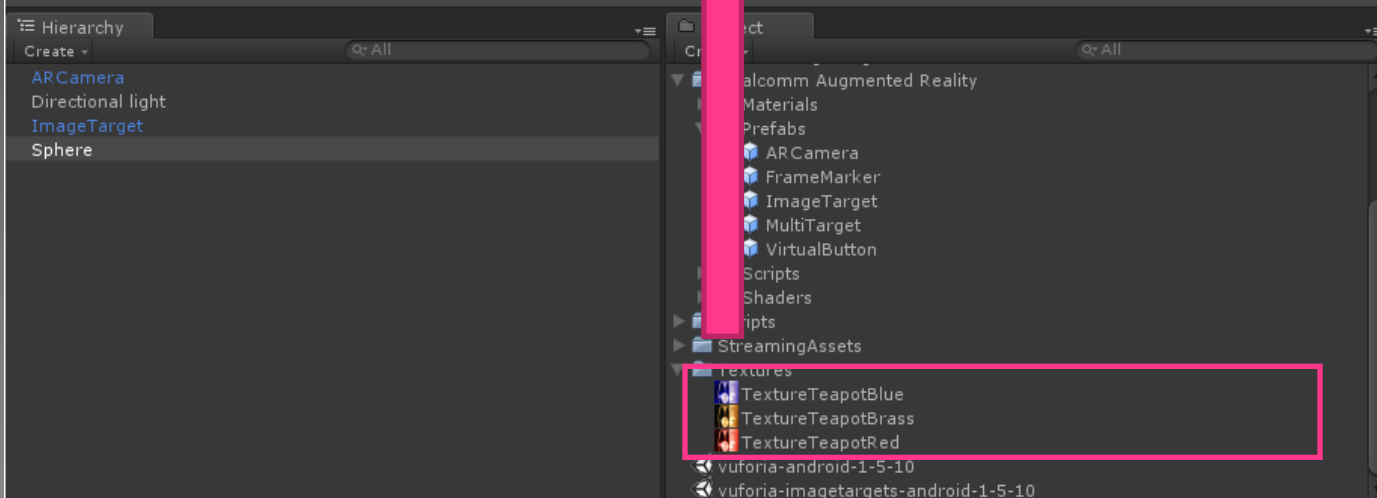
## 2.8.1 新增疊加物件



Step1.Create/sphere (沒有限制，這邊可以使用別的3D物件)

## 2.8.2 新增材質

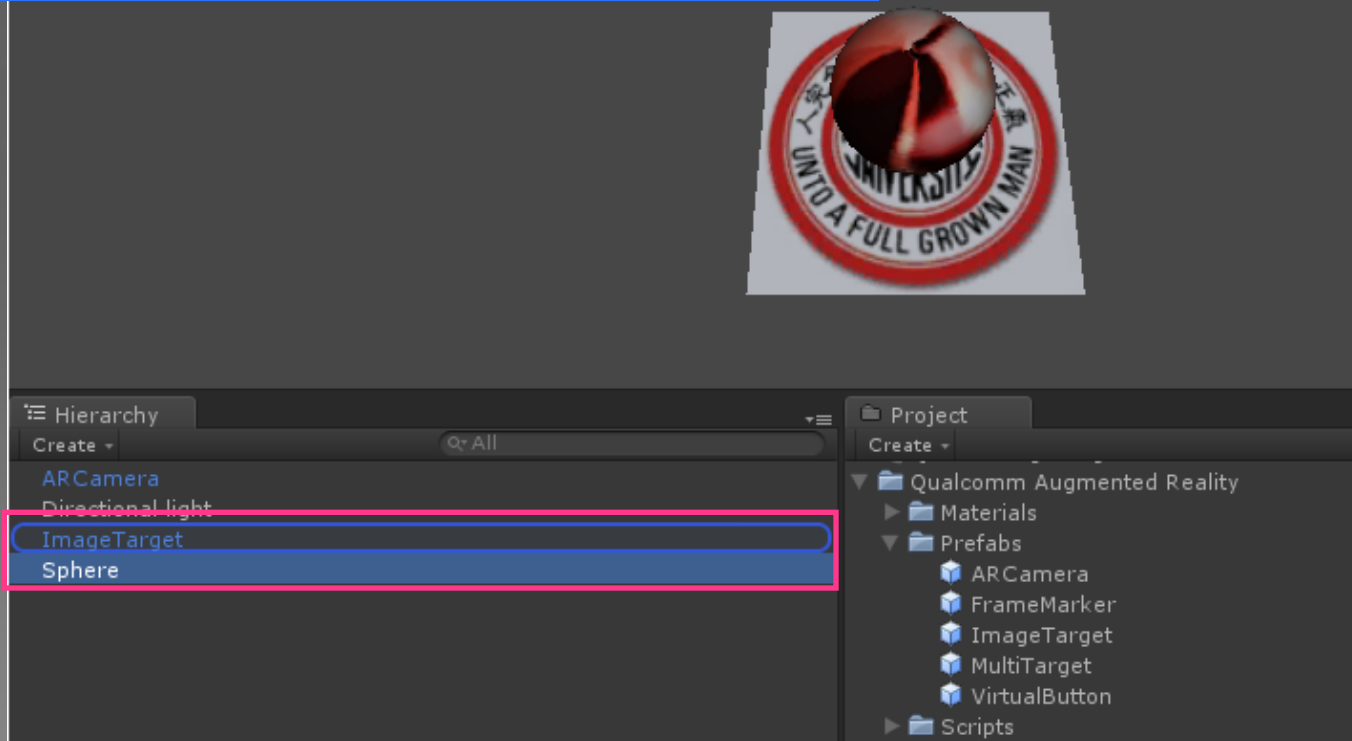
註:可以使用材質來改變3D物件的顏色，  
使用方式:將下面視窗的材質拖曳到3D物件中



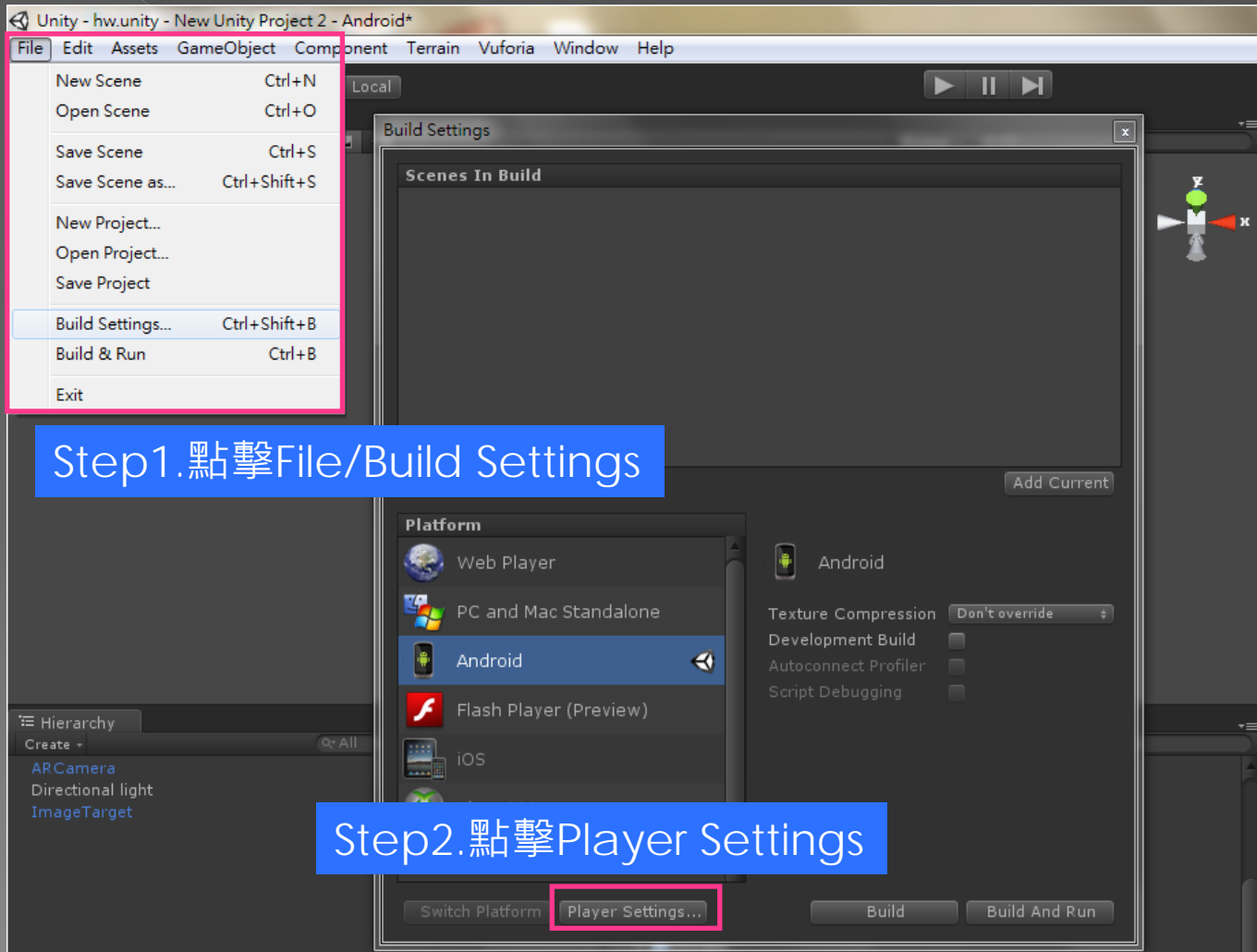
▲ Compressed texture money\_scaled is used as icon. This might compromise visual quality of the final image. Uncompressed format might be considered as be

## 2.8.3 放入ImageTarget物件

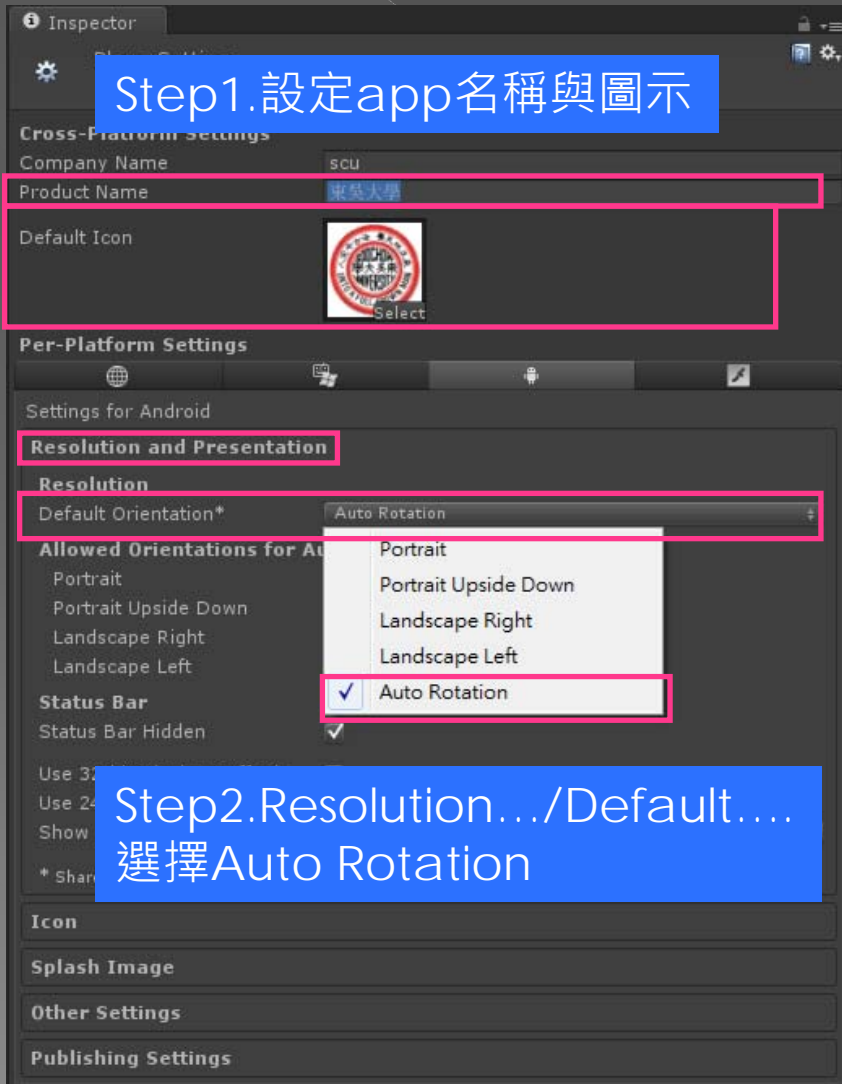
Step1. 將3D物件拖曳到ImageTarget中



# 3.1.1 專案匯出設定

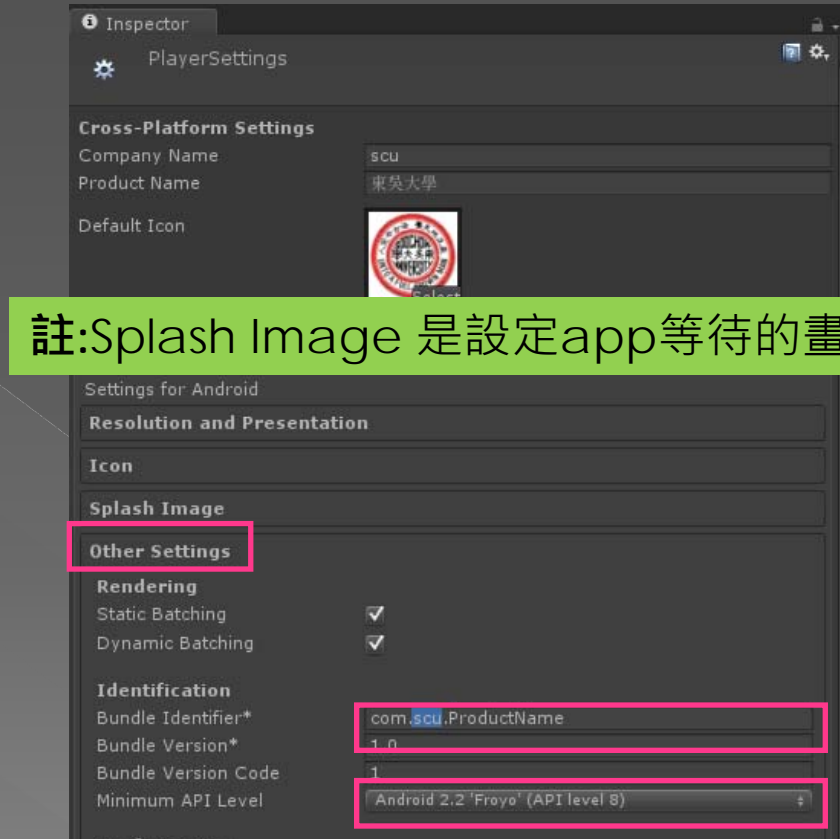


# 3.1.2專案匯出設定



Step1.設定app名稱與圖示

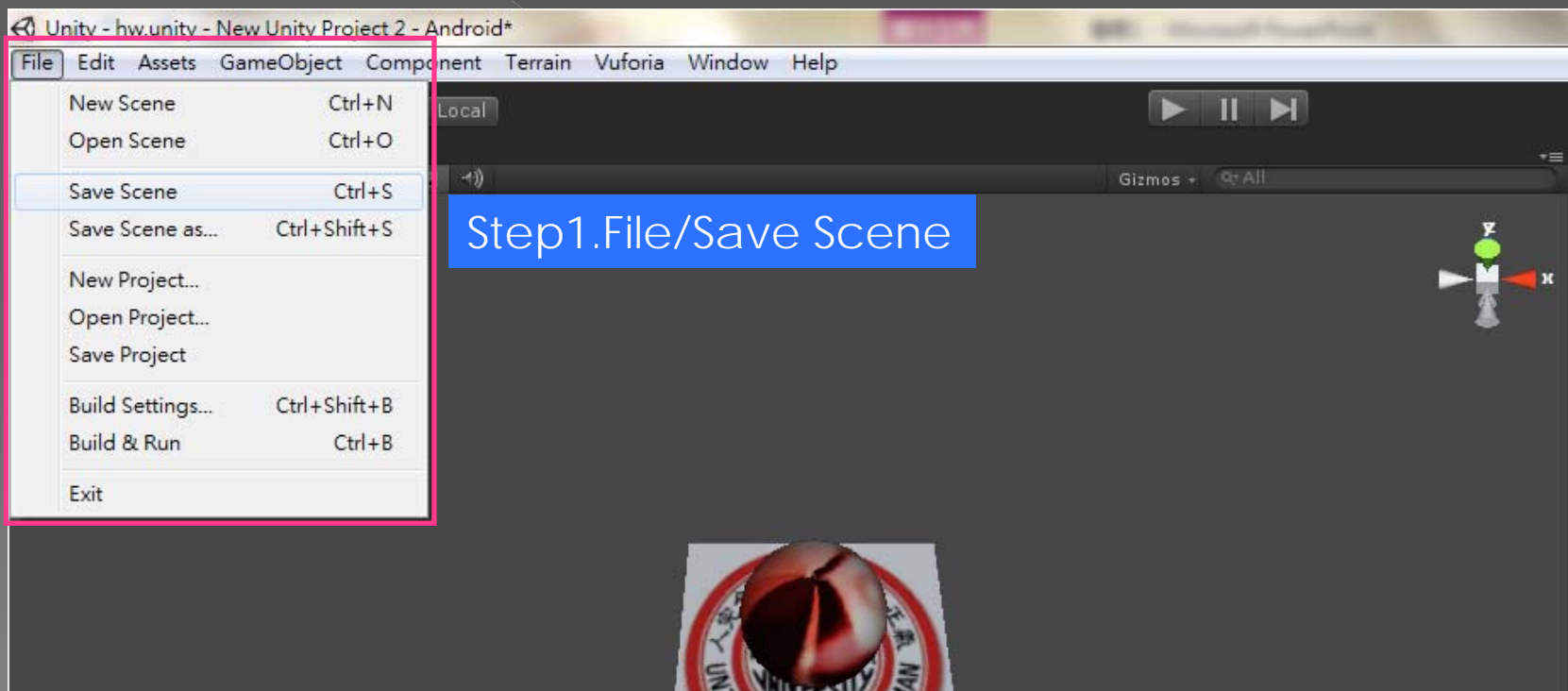
Step2.Resolution.../Default...  
選擇Auto Rotation



註:Splash Image 是設定app等待的畫面

Step3.Other Settings/  
Bundle Identifier\* 將scu那格修改其他名字  
Minmum API Level 設定Android2.2

# 3.1.3 儲存匯出設定





# 3.2 匯出專案

**Step1. File/Build Settings**

**Step2. 點擊Build**

註:支援多種平台, ios....

# 3.3將安裝檔移入手機安裝

Step1.匯出完成後，會產生一個apk檔



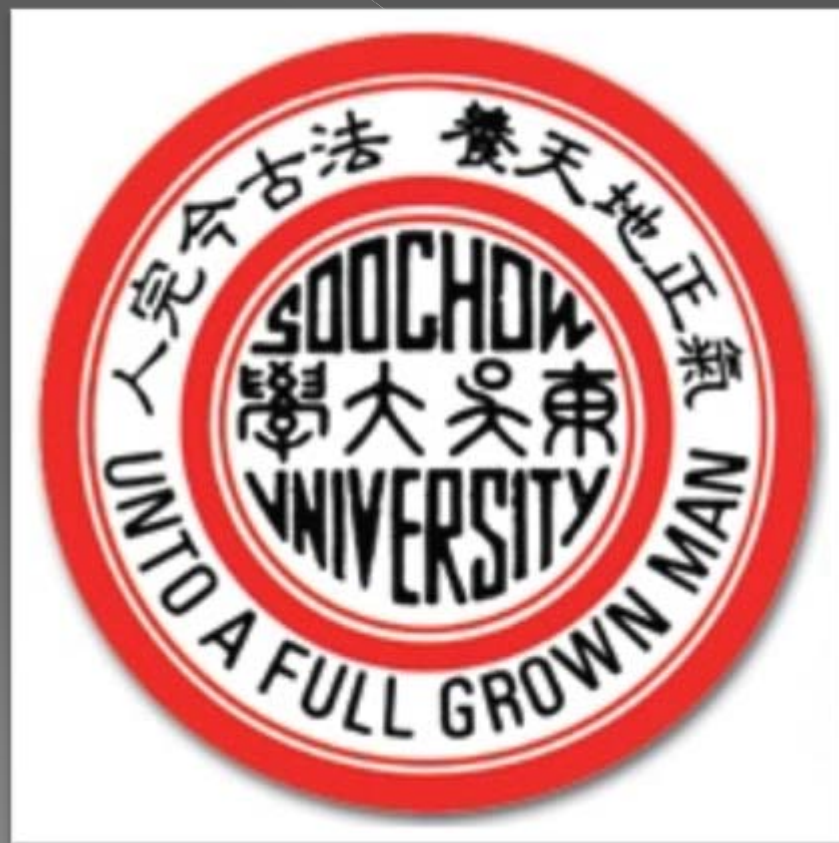
東吳大學.apk

類型: APK 檔案



Step2.將apk移入手機，安裝即可

## 4.1原圖測試(辨識程度佳)



註:本軟體辨識率非常好，你可以試著將影像遮住一半以上，依舊能夠辨識

## 4.2 真實影像測試(辨識程度佳)





## 4.3 相似影像測試(辨識程度佳)



# 生活中的應用例子

某一天中午，我走在街上，看到滿街的飲食店的招牌...  
我....我.....我拿起了手機~開了這個app  
我終於知道，我餓了。





感謝大家的聆聽

Thank you~😊