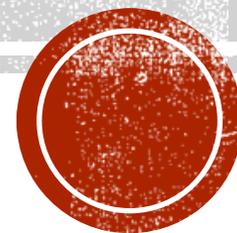


虚 拟 现 实 与 技 术

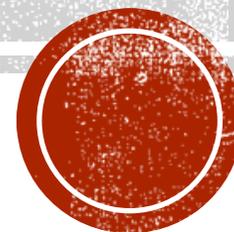
刘石坚 博士/副教授

C2-306

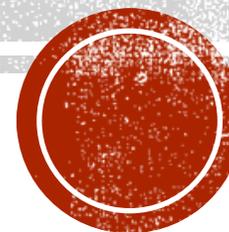
liusj2003@126.com



第8讲 AR引擎 VUFORIA

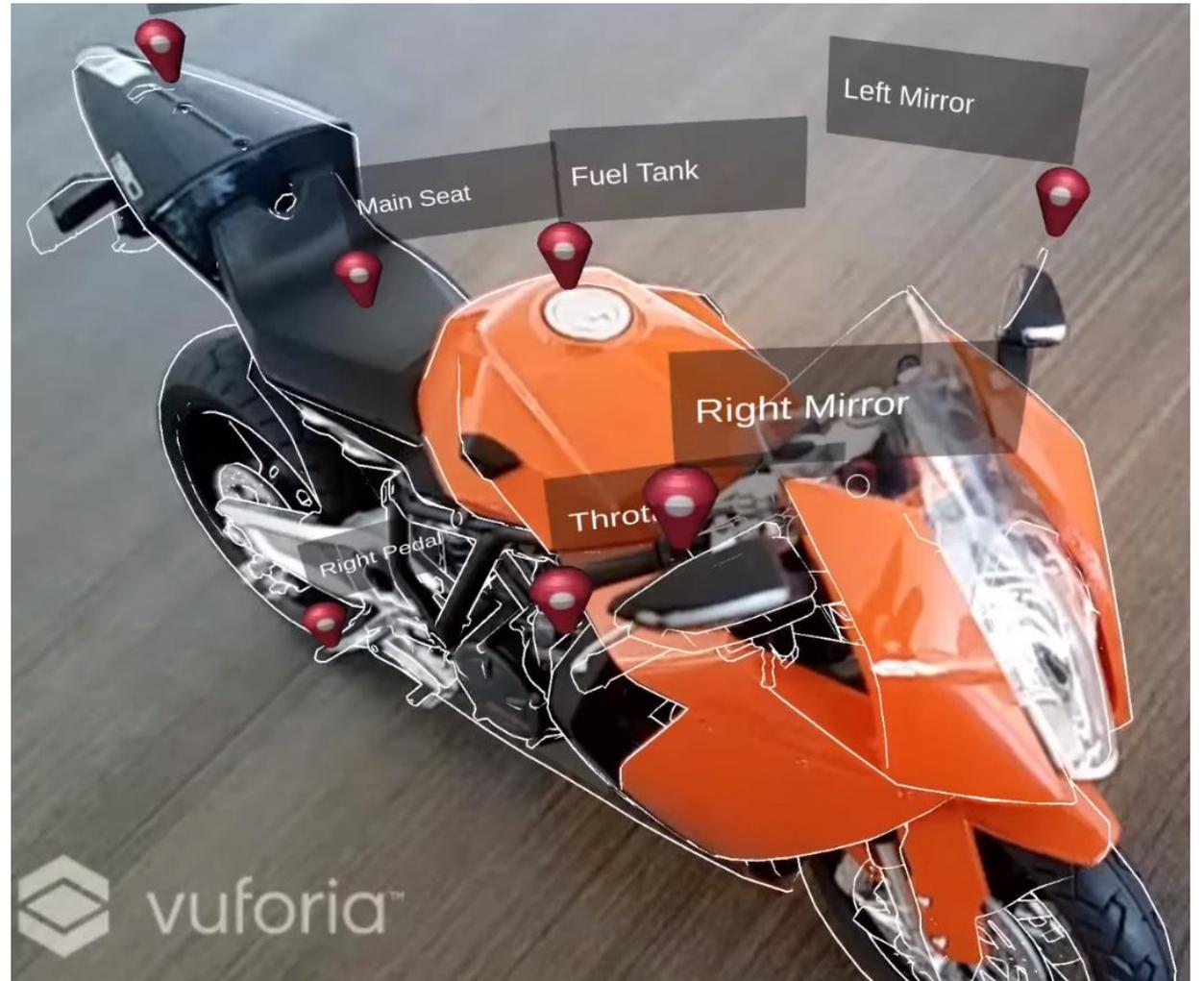


—、 初 始 VUFORIA



VUFORIA 引擎

- 目前应用最广的AR开发平台之一
- 支持的硬件平台：
智能手机、平板电脑、AR眼镜
- 支持的软件平台：
Android、iOS、UWP、Unity
- 支持的开发语言：
C#（Unity）、C++（iOS and UWP）、Java（Android）。



VUFORIA DEVELOPR PORTAL:

[HTTPS://DEVELOPER.VUFORIA.COM/](https://developer.vuforia.com/)

Jun 20, 2019

Vuforia Engine 8.3 is Available!

Summer is here, the sun is out, and so is Vuforia Engine's newest release! The team has been eagerly awaiting this announcement, as it's one of our *smartest* advancements with AR.

- Advanced Model Targets 360 - Recognition Powered by AI
- Brand New Model Target Generator Interface
- Improvements to Platform Specific Illumination Classes
- Upgrade to ARCore 1.7

In our last major release, we announced Advanced Model Targets that allowed for multiple views. Using AI, we enabled developers to choose several guide views that would appear when the user approached a physical model.

Now – no guide views needed. Advanced Model Targets 360 can recognize a physical

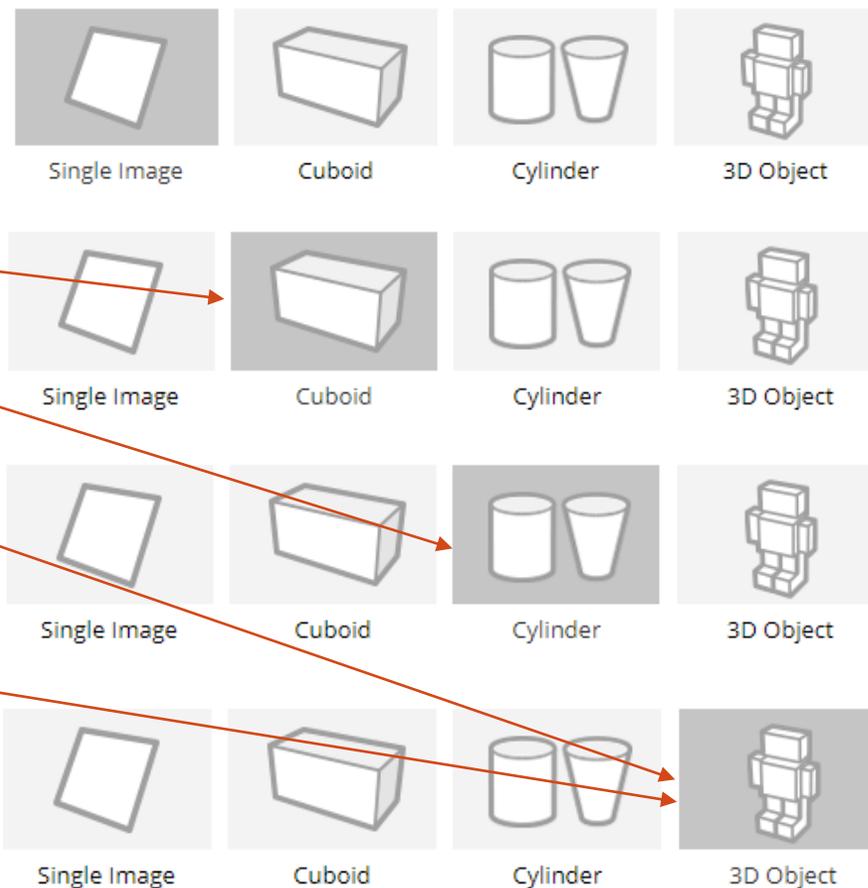
VUFORIA 支持的目标类型

- 基于图片纹理特征的AR

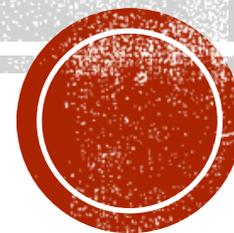
- 单个平面图片
- 多个平面图片
- 圆柱/圆锥表面图片
- 任意3D对象

- 基于几何形状特征的AR

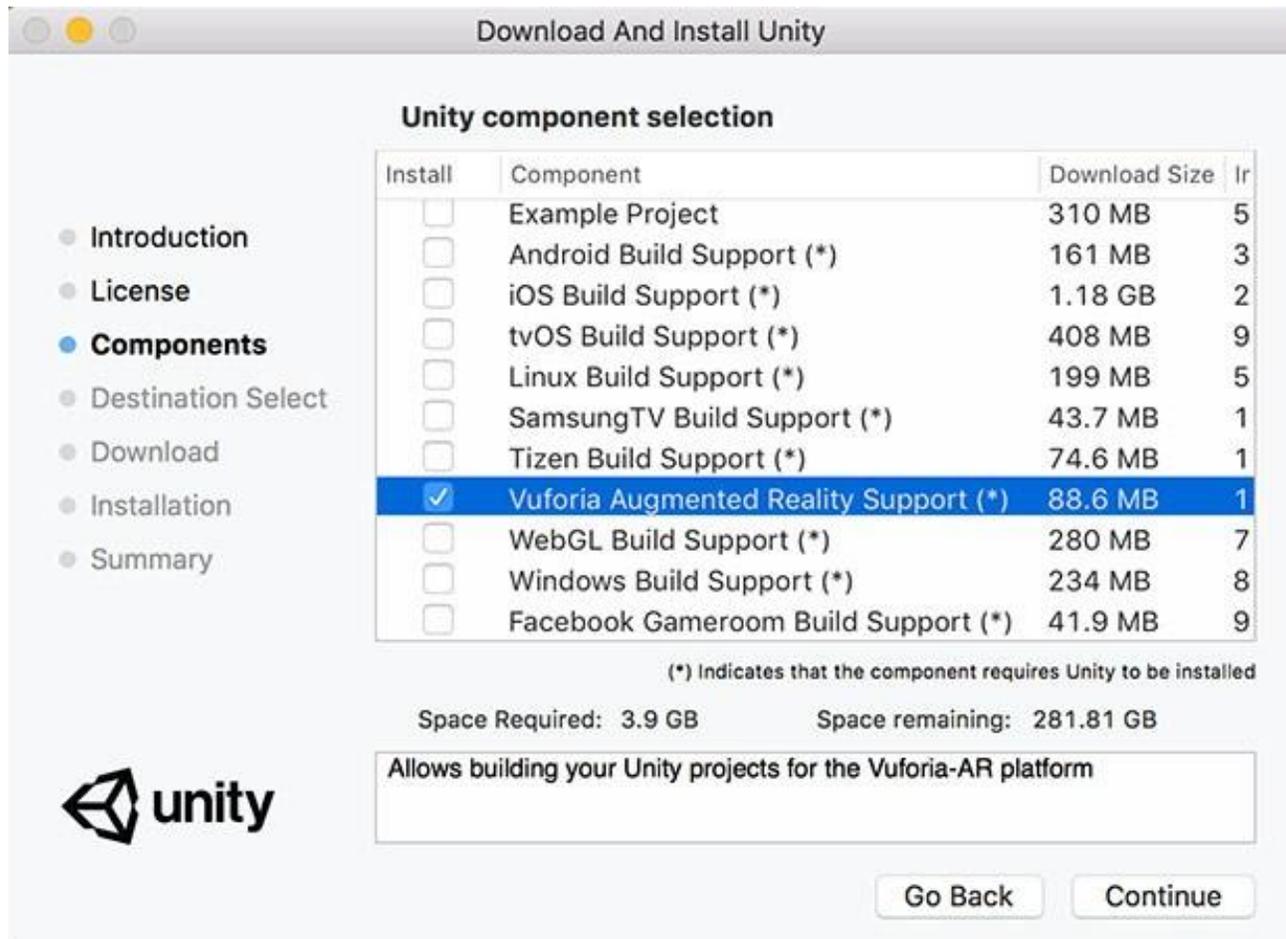
- 任意3D对象



二、在 UNITY 中使用 VUFORIA



VUFORIA引擎预备-UNITY版本 < 2019.2



The screenshot shows the 'Download And Install Unity' window. On the left, there is a navigation menu with 'Components' selected. The main area is titled 'Unity component selection' and contains a table with columns for 'Install', 'Component', 'Download Size', and 'Ir'. The 'Vuforia Augmented Reality Support (*)' component is selected with a checkmark. Below the table, it indicates 'Space Required: 3.9 GB' and 'Space remaining: 281.81 GB'. At the bottom, there is a text box stating 'Allows building your Unity projects for the Vuforia-AR platform' and two buttons: 'Go Back' and 'Continue'.

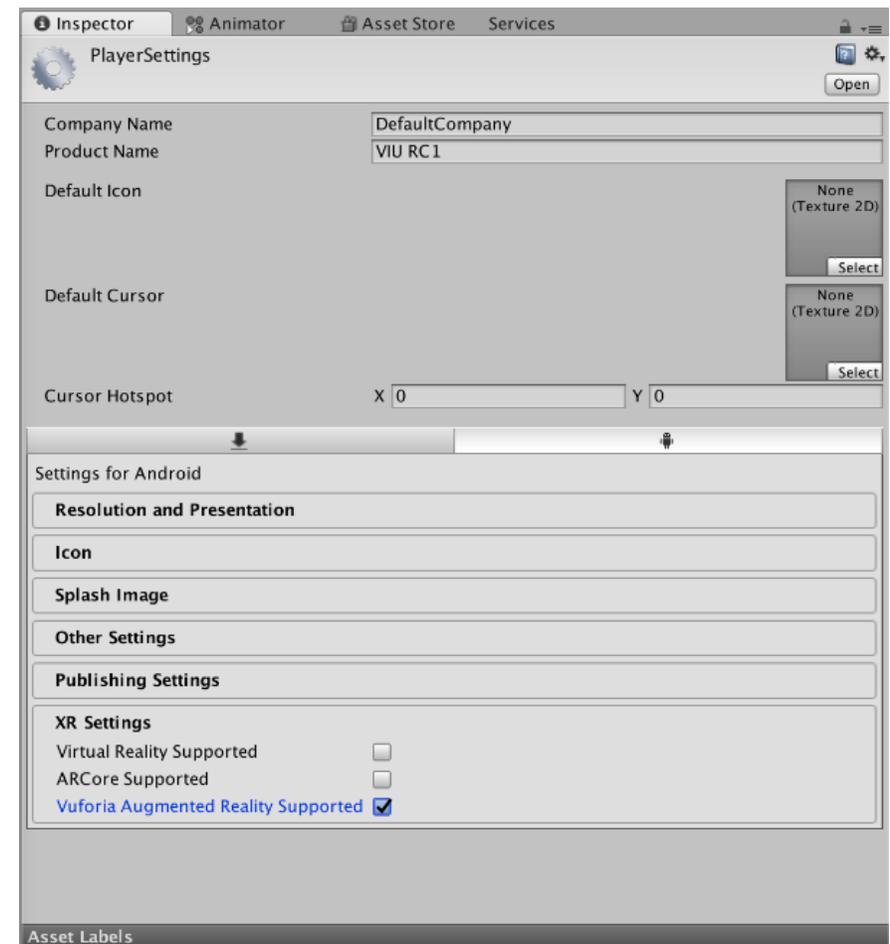
Install	Component	Download Size	Ir
<input type="checkbox"/>	Example Project	310 MB	5
<input type="checkbox"/>	Android Build Support (*)	161 MB	3
<input type="checkbox"/>	iOS Build Support (*)	1.18 GB	2
<input type="checkbox"/>	tvOS Build Support (*)	408 MB	9
<input type="checkbox"/>	Linux Build Support (*)	199 MB	5
<input type="checkbox"/>	SamsungTV Build Support (*)	43.7 MB	1
<input type="checkbox"/>	Tizen Build Support (*)	74.6 MB	1
<input checked="" type="checkbox"/>	Vuforia Augmented Reality Support (*)	88.6 MB	1
<input type="checkbox"/>	WebGL Build Support (*)	280 MB	7
<input type="checkbox"/>	Windows Build Support (*)	234 MB	8
<input type="checkbox"/>	Facebook Gameroom Build Support (*)	41.9 MB	9

(*) Indicates that the component requires Unity to be installed

Space Required: 3.9 GB Space remaining: 281.81 GB

Allows building your Unity projects for the Vuforia-AR platform

Go Back Continue



The screenshot shows the Unity Inspector window with the 'PlayerSettings' component selected. The 'XR Settings' section is expanded, and the 'Vuforia Augmented Reality Supported' checkbox is checked. Other settings like 'Company Name', 'Product Name', and 'Default Icon' are visible.

Inspector Animator Asset Store Services

PlayerSettings

Company Name: DefaultCompany

Product Name: VIU RC1

Default Icon: None (Texture 2D)

Default Cursor: None (Texture 2D)

Cursor Hotspot: X 0, Y 0

Settings for Android

Resolution and Presentation

Icon

Splash Image

Other Settings

Publishing Settings

XR Settings

Virtual Reality Supported

ARCore Supported

Vuforia Augmented Reality Supported

Asset Labels



VUFORIA 引擎 预备-UNITY 版本 ≥ 2019.2

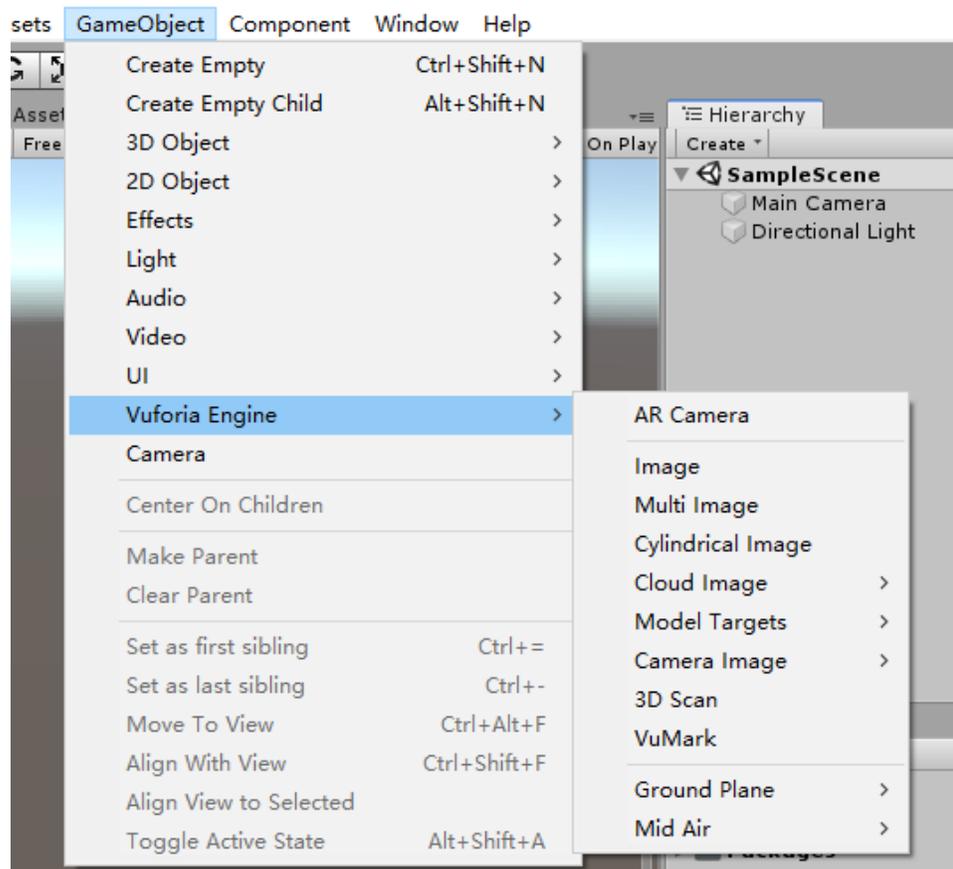
- Package Manager 窗口



VUFORIA 核心对象

■ 添加核心对象

方法一：主菜单 → GameObject 菜单 → 方法二：层次窗口 → 右键弹出窗口 →



Single Image



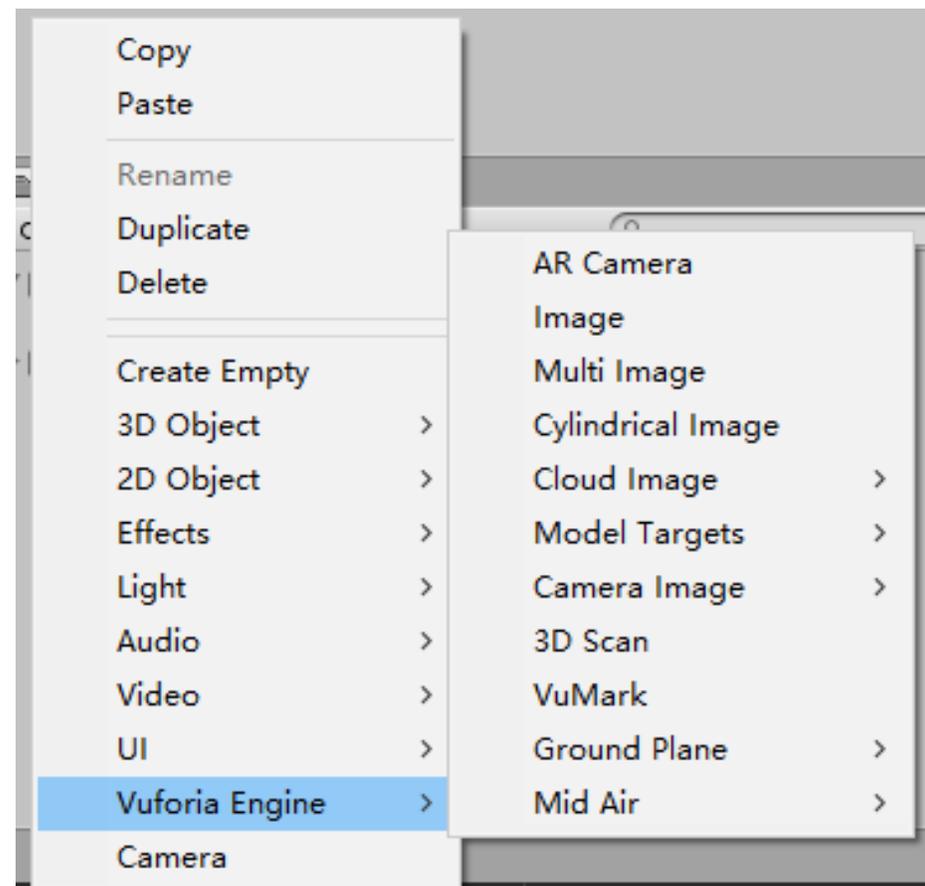
Cuboid



Cylinder



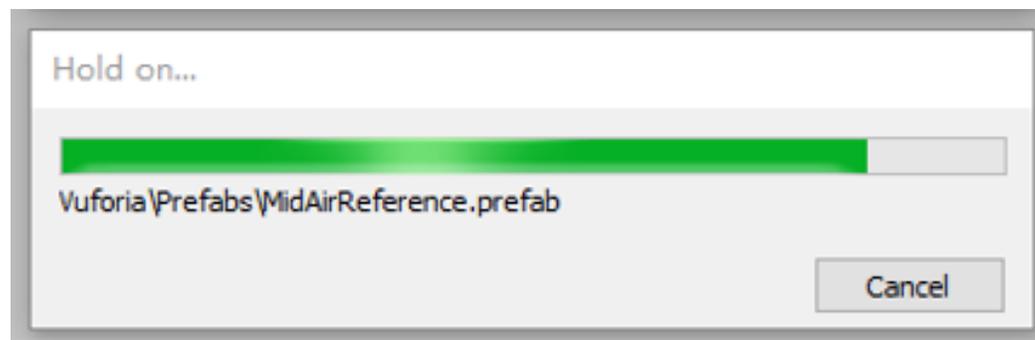
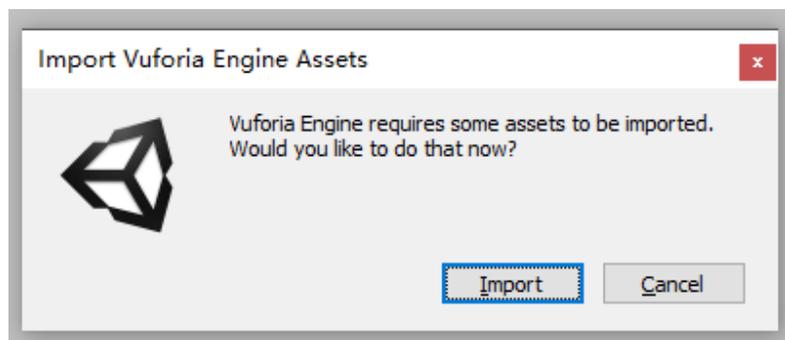
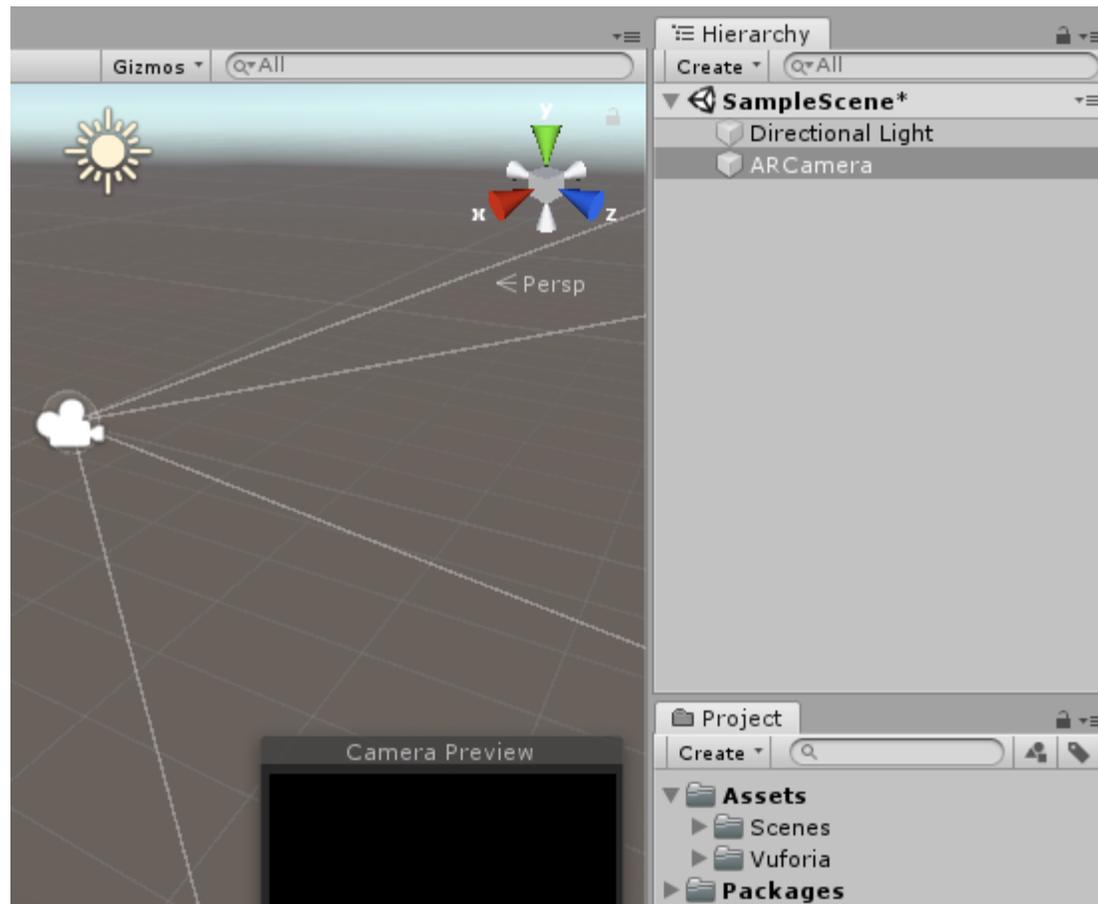
3D Object



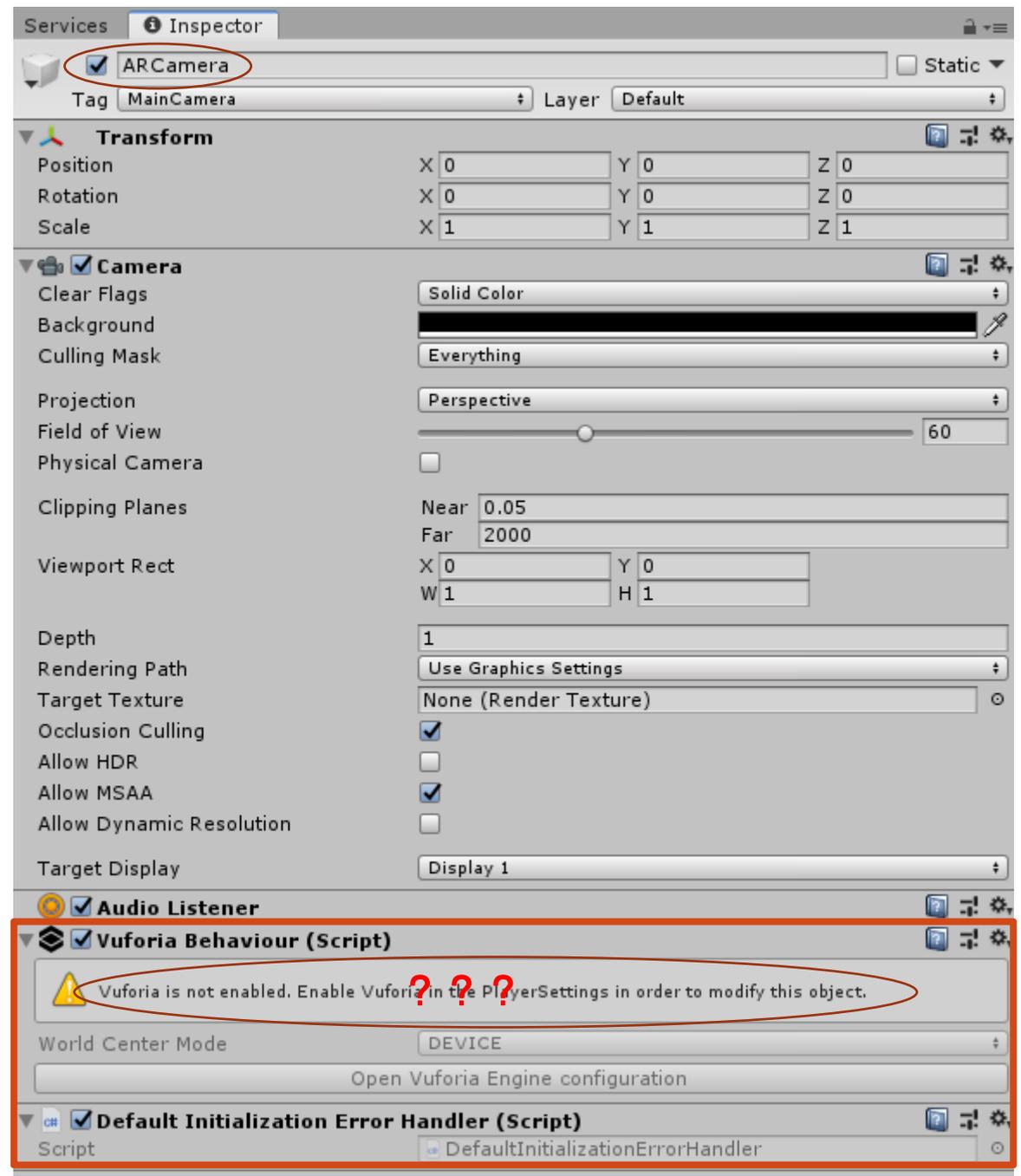
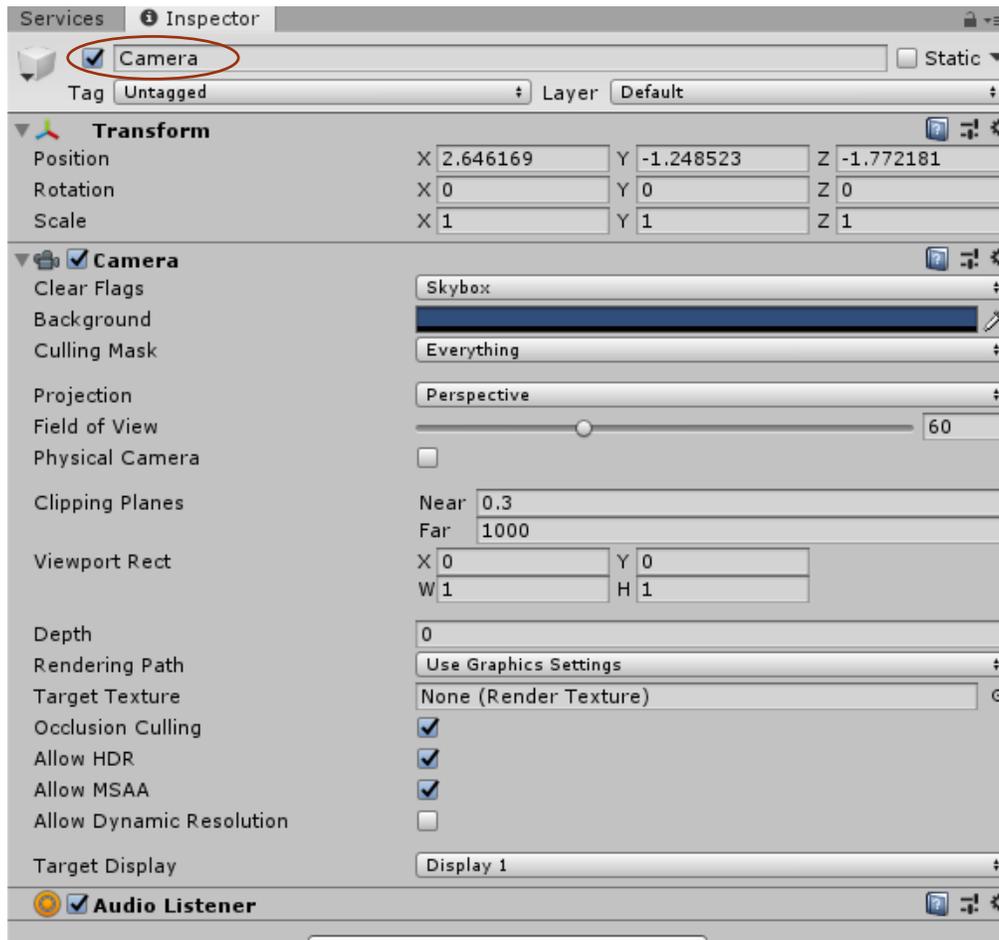
ARCAMERA

- AR相机对象简介
 - 获取相机图像显示在屏幕上
 - 使用摄像头：后置（手机、平板）
- 如何使用AR相机对象
 - 删除已有的Main Camera
 - 添加AR Camera

Vuforia Engine → AR Camera
组件缺失？



ARCAMERA的组件



LICENSE

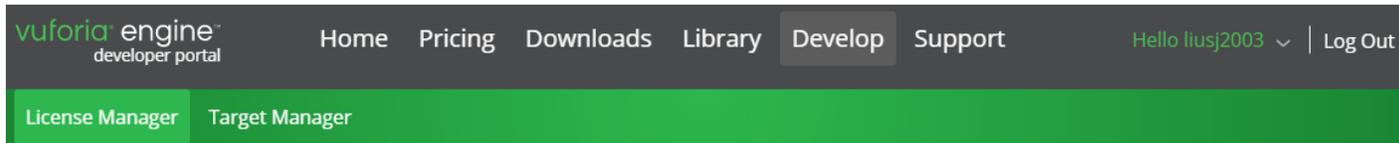
如何添加许可证

1. 在线申请开发密钥:

<https://developer.vuforia.com/vui/develop/licenses>

2. 粘贴开发密钥:

ARCamera → Vuforia Behaviour → Open Vuforia Engine configuration → Inspector 窗口 → Global



License Manager

Get Development Key

Buy Deployment Key

Create a license key for your application.

Name	SSON ⓘ	Type	Status ▾	Date Modified
Test	N/A	Develop	Active	Dec 05, 2018

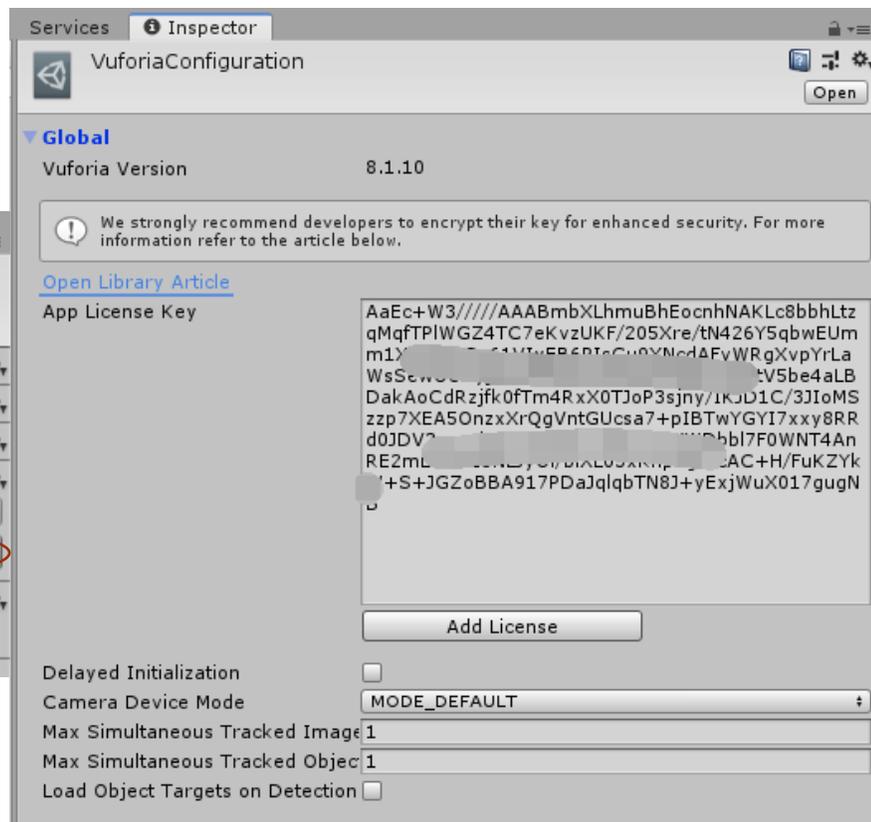
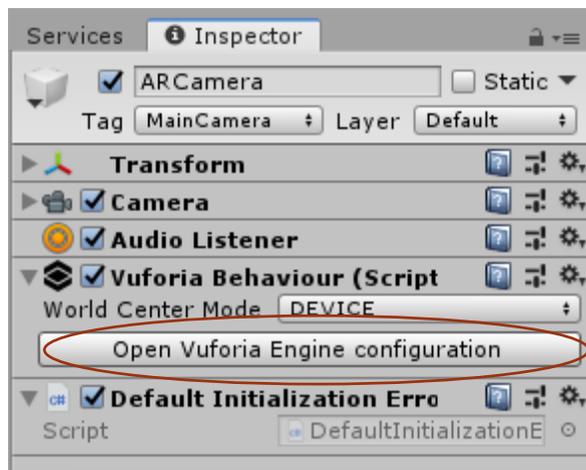


IMAGE 对象

- Image对象简介
 - 自定义图片目标
 - 具有丰富的纹理细节

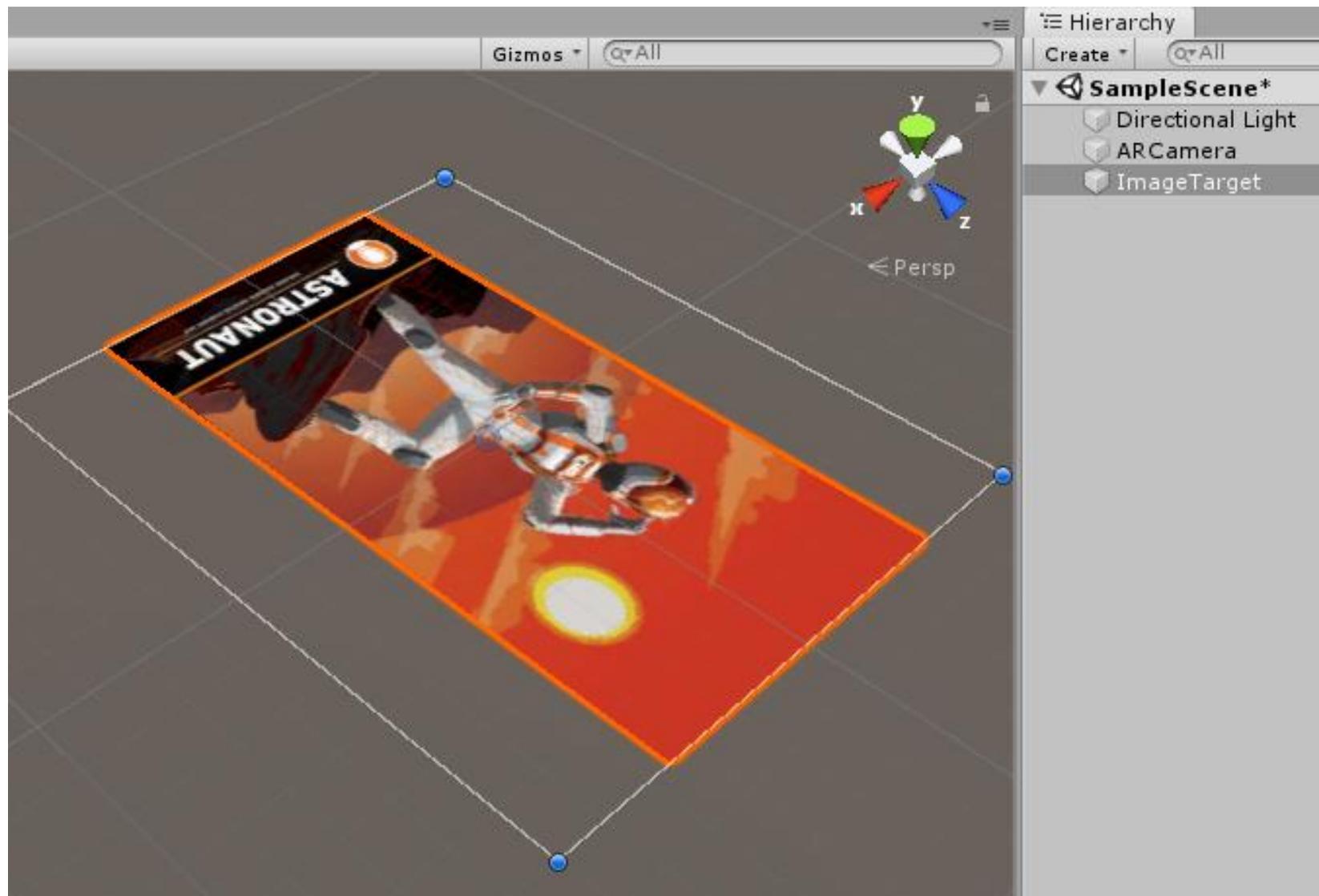
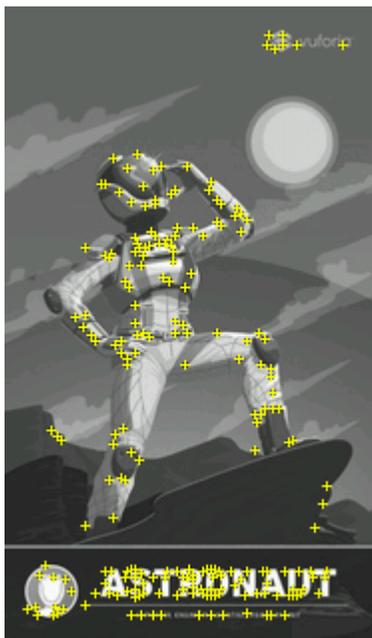
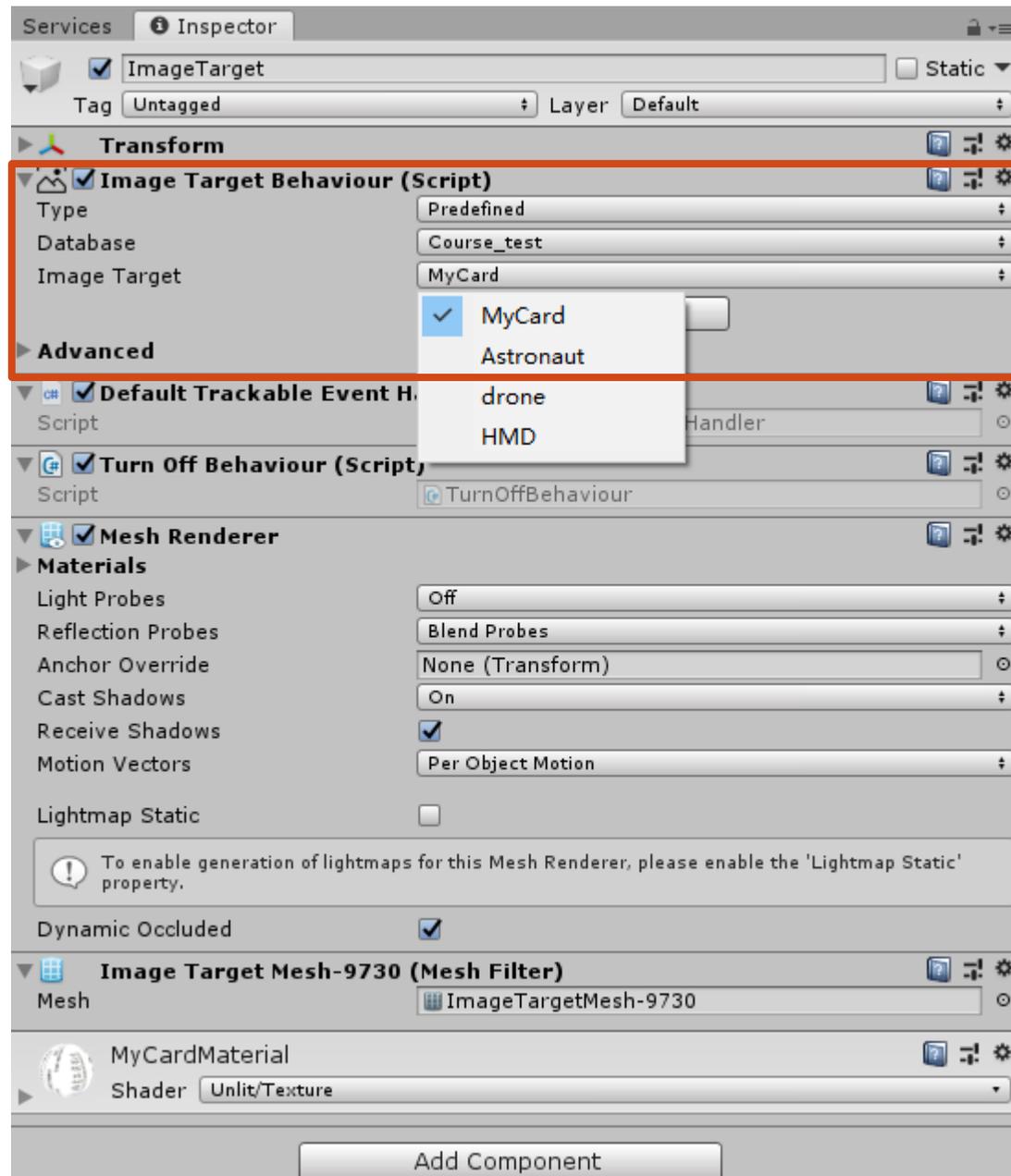
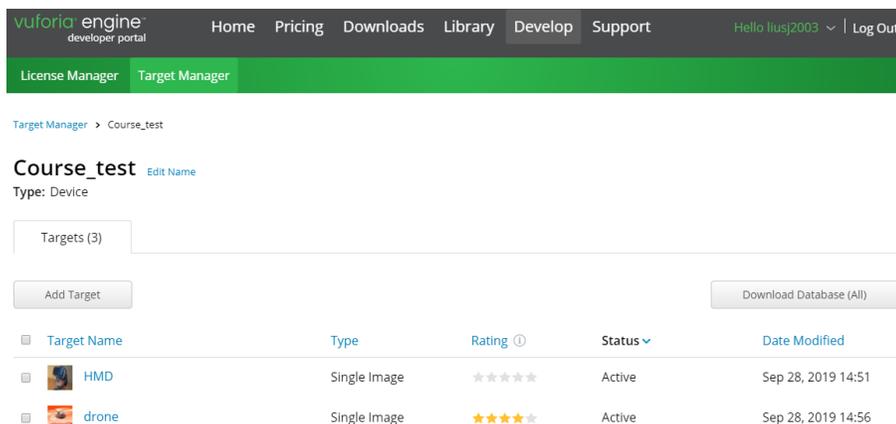


IMAGE 对象的组件

- 如何添加Image对象
 - 在线添加数据库
<https://developer.vuforia.com/vui/develop/databases>
 - 下载并导入数据库文件
 - 创建ImageTarget对象
 - 选择目标对象：
ImageTarget→ImageTargetBehaviour组件→ImageTarget下拉框

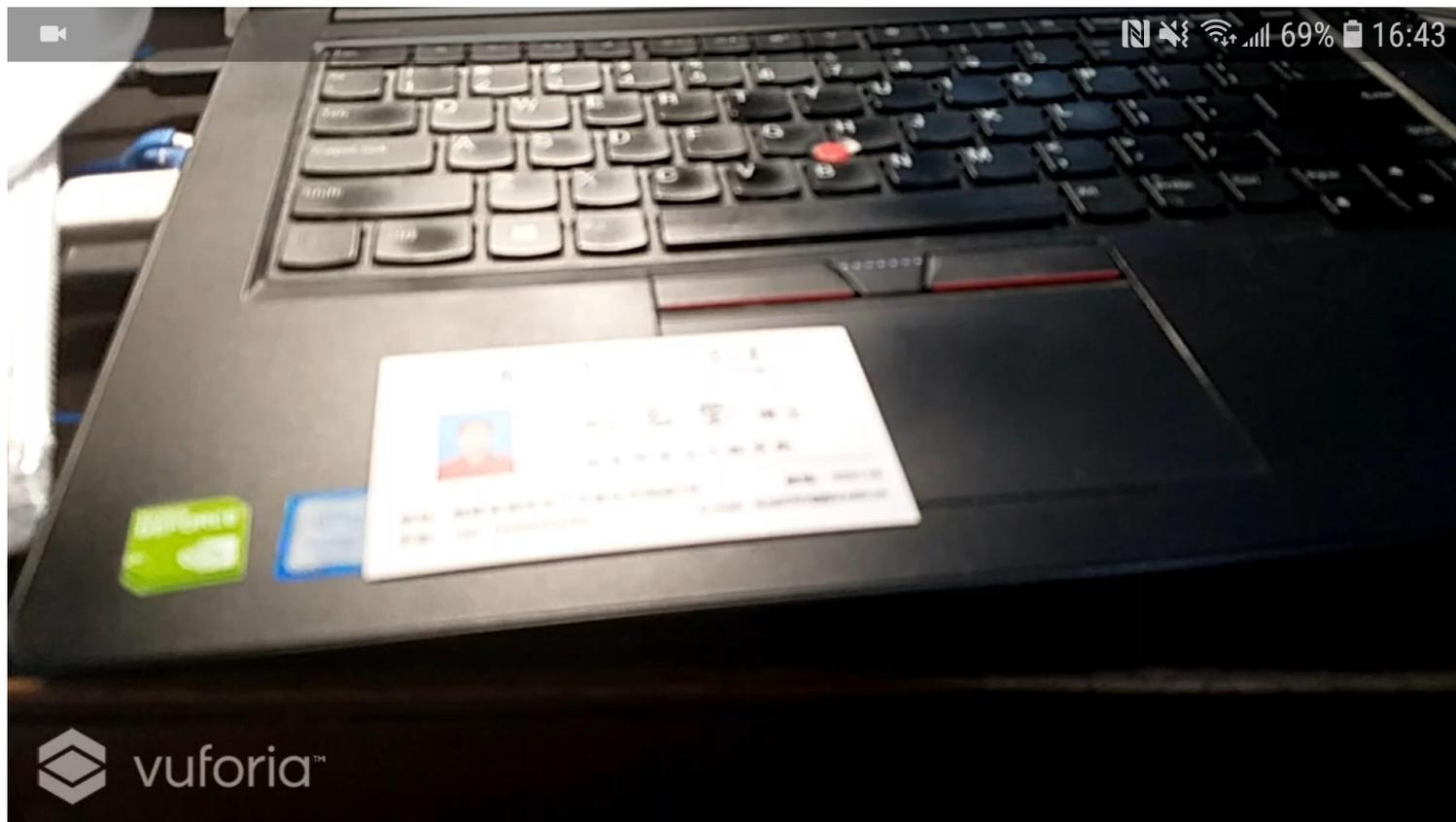


具体操作步骤

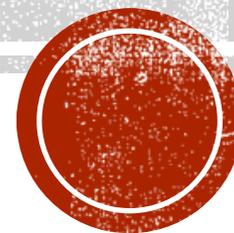
1. 添加ARCamera
2. 配置许可证
3. 激活目标数据库
4. 添加“辅助对象”到场景中
5. 编译并发布工程



体验AR

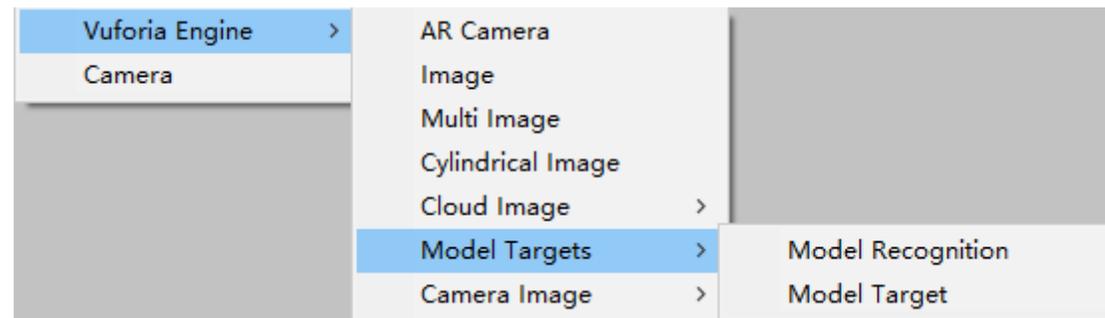


三、课后



思考&预习

- 除Vuforia以外，你是否了解其他的AR引擎？
- AR引擎的工作原理是什么样的？
 - AR引擎如何识别图片对象？
 - 当相机角度改变以后，AR引擎如何正确判断图片对象的方位？
- 除了图片纹理特征，还有什么特征可以用来识别AR对象？
- 如果图片因弯曲而不再处于一个平面上，是否还能进行AR识别和追踪？Vuforia是怎么做的？
- Vuforia中的Model Target是什么？他与Model Recognition有什么区别？



谢 谢

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liusj2003@126.com

