



Unity跨平台VR开发

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今日内容

- Unity内建支持的VR设备介绍
- Unity对VR渲染的底层优化
- Unity编辑器中VR项目演示



► AVAILABILITY  VR  MR



Facebook

► NOW 

In 2014, Facebook bought Oculus, the company that dreamed up the Rift headset and (literally) kick-started the VR revolution. [Read more](#)



HTC

► NOW 

The Taiwanese phone manufacturer teamed up with game maker Valve Software to launch a high-end headset, the HTC Vive. [Read more](#)



Sony

► OCTOBER 2016 

Unlike the Rift and the Vive, Sony's PlayStation VR is designed to work not with a PC but its own game console—which more than 36 million already own. [Read more](#)





Google

► NOW 

Google created Cardboard, its cheap assemble-it-yourself viewer, to bring virtual reality to the masses via their smartphones. [Read more](#)



Samsung

► NOW 

The Gear VR straps a Galaxy smartphone (new models only) to your head to deliver games and apps—all powered by Oculus software. [Read more](#)



OSVR

► DEV KIT AVAILABLE 

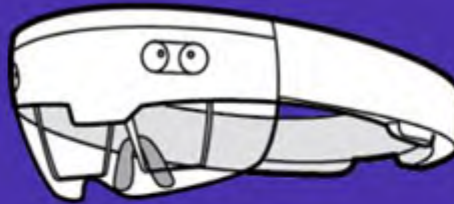
An open source platform for VR and MR launched in 2015 and backed by a consortium of companies like Intel and gaming outfit Razer. [Read more](#)



Fove

► FALL 2016 

This startup proposes to use eye tracking to sharpen what you focus on and blur everything else, cutting down on processing power.



Microsoft

► DEV KIT AVAILABLE 

The company's HoloLens is a wireless, wearable, sensor-packed computer that aggregates its data to embed holograms in the user's environment. [Read more](#)



Meta

► DEV KIT, FALL 2016 

Initially funded via Kickstarter in 2013, the startup has created a visor that projects virtual interactive displays in the wearer's field of vision.

Unity编辑器内建支持的VR设备





Oculus Rift



Gear VR



Playstation VR



Steam VR/HTC Vive



*Google
Cardboard*



Microsoft HoloLens





Unity 5.1 – 2015-06-09 开始拥有统一的VR接口



Unity 5.2 – 2015-09-08 添加对PSVR的支持



Unity 5.3 – 2015-12-08 添加一些新的VR功能

- 用户可以重写Head Tracking (*view matrix + FOV*)



Unity 5.4 – 2016-07-28 很多新的VR功能

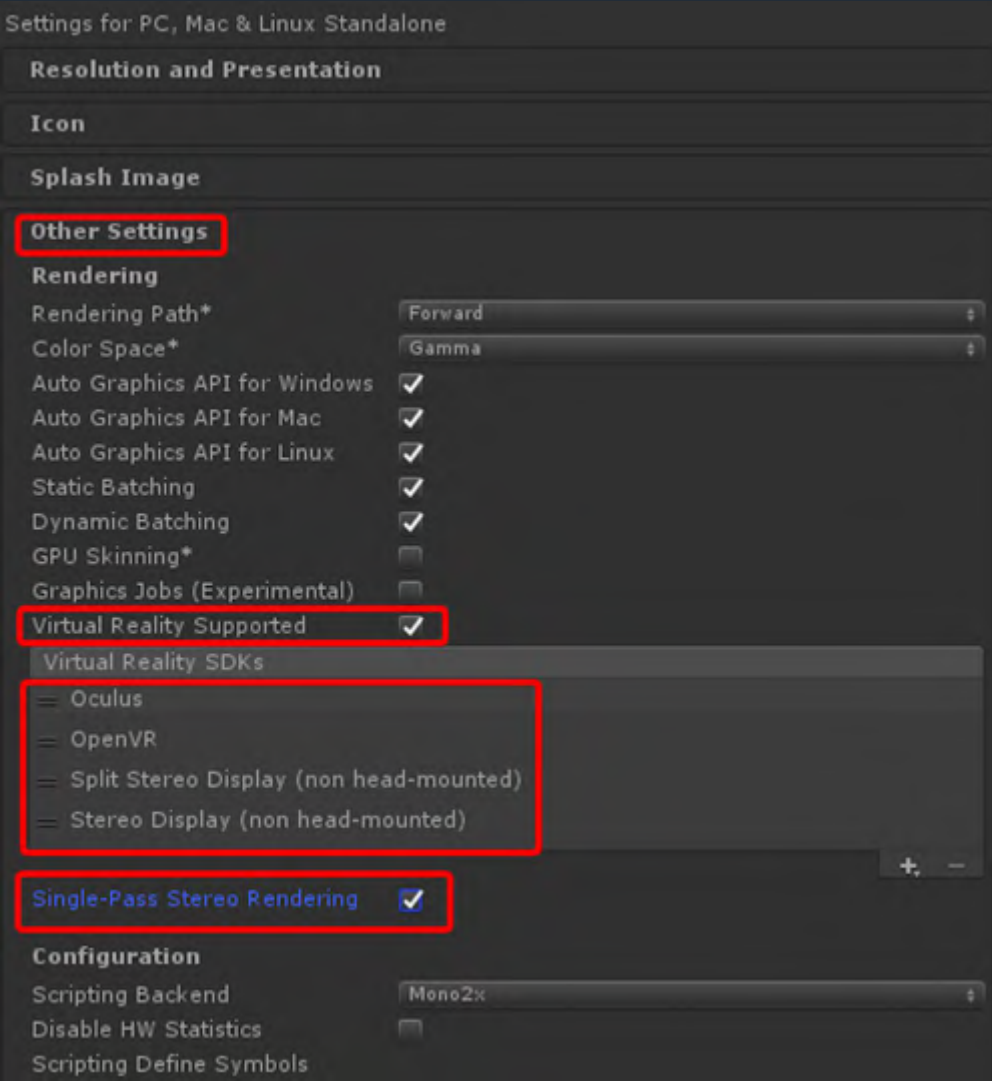
- 同时支持多种VR设备
- *Single-Pass Stereo Rendering*
- *Graphics Jobs (Experimental)*



同时支持多种VR设备

- 最新的Unity 5.4版本支持Oculus, GearVR, OpenVR (SteamVR/HTC Vive) 和 Playstation VR (PSVR需要单独设置)
- 提供统一API用于和不同的VR设备进行交互
- 无需添加额外的SDK (因为已经集成到Unity了)
- 统一的底层优化 (例如 : Single-Pass Stereo Rendering)

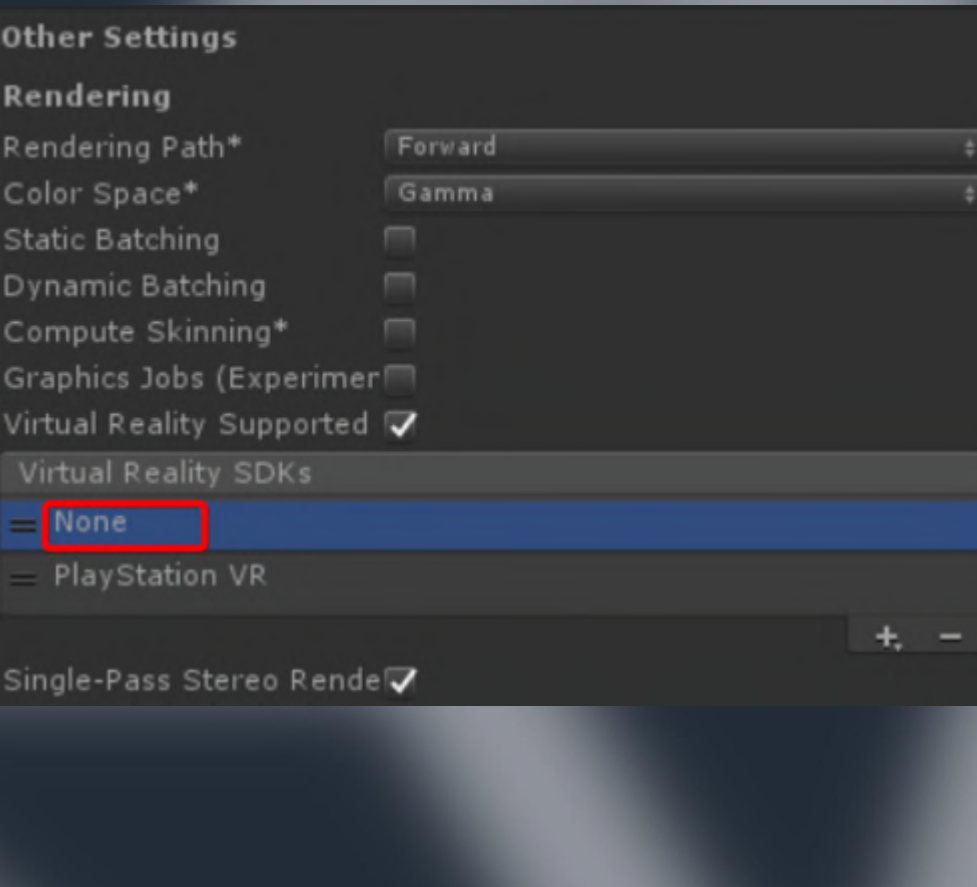




Oculus&OpenVR开发选项

- Oculus支持Oculus Rift & GearVR开发
- OpenVR支持SteamVR & HTC Vive开发
- 使用OpenVR需要先安装Steam和SteamVR

PSVR开发选项



- 列表上的None表示项目开始运行的时候不会直接进入VR模式，在这里你可以检测头盔是否已经正确连接，然后再过渡进入VR模式
- 如果是处于开发阶段，可以直接把Playstation VR选项放到上面，这样就直接进入VR模式

Single-Pass Stereo Rendering

- 改变了之前先渲染左眼，再渲染右眼的模式，一次性完成两只眼睛的渲染
- 通常情况下可以把Main Thread上的渲染时间减半，也可以降低Render Thread上所消耗的渲染时间
- 有一些脚本和Image FX可能不工作，要具体项目具体分析



Graphics Jobs

- 5.4系列版本里面的试验性功能
- 将Main Thread上的渲染工作分配一部分给Worker Threads，这可以大幅减轻Main Thread占用的CPU
- Forward Rendering和Deferred Rendering完全支持Graphic Jobs

Render Mode	Graphics Jobs Support
Forward Rendering	Full.
Deferred Rendering	Full.
Legacy Deferred	None.

Other Settings

Rendering

Rendering Path* Forward

Color Space* Gamma

Auto Graphics API for Windows ☒

Auto Graphics API for Mac ☒

Auto Graphics API for Linux ☒

Static Batching ☒

Dynamic Batching ☒

GPU Skinning* ☐

Graphics Jobs (Experimental) ☐

Virtual Reality Supported ☒

Virtual Reality SDKs

= Oculus

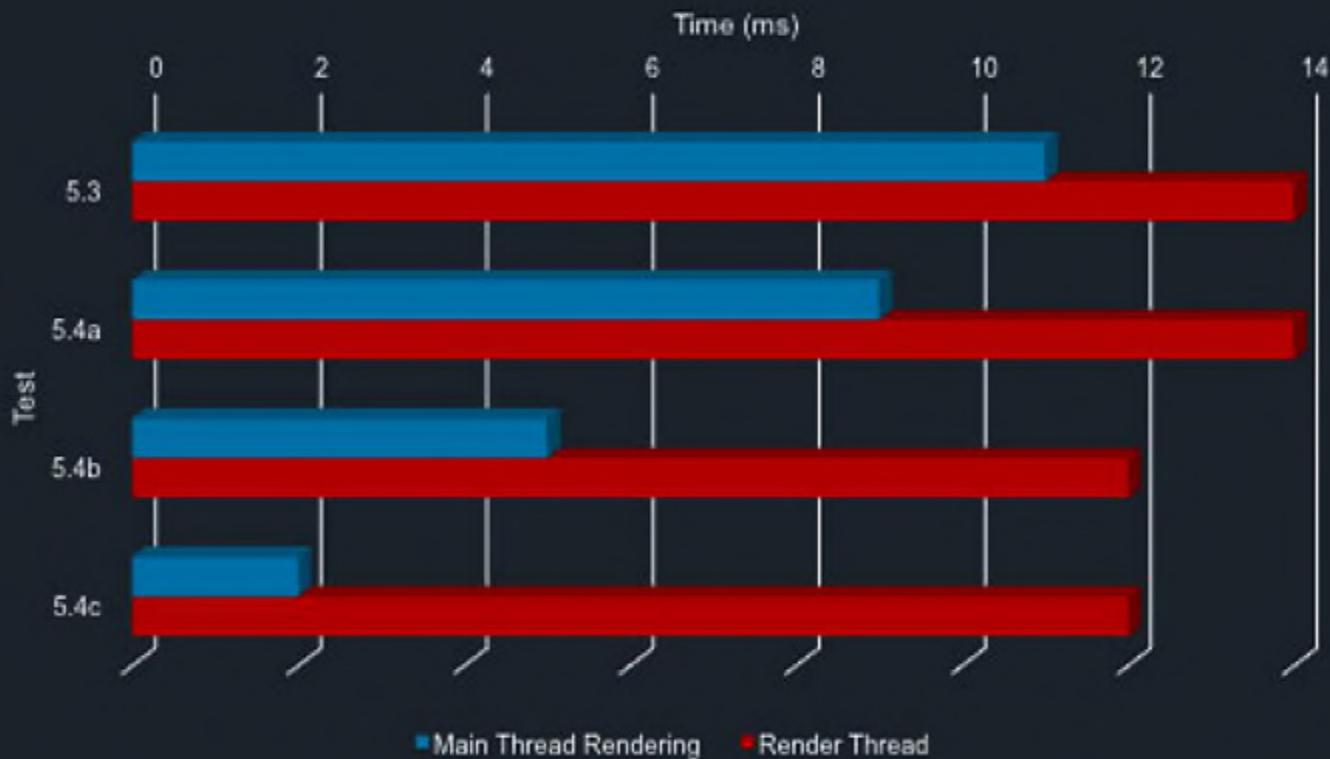
= Stereo Display (non head-mounted)

= Split Stereo Display (non head-mounted)

Single-Pass Stereo Rendering ☐



Performance Test



5.4a Unity 5.4 two pass VR.

5.4b Unity 5.4 Single Pass VR.

5.4c Unity 5.4 Single Pass VR + Graphics Jobs enabled.

Note: Performance increases shown here are for an ideal case. They may well vary from project to project depending on the type of content you are rendering and how you are rendering it.



Playstation®VR专属更新 - HTile Culling

- 当用Unity内置的Playstation®VR进行渲染时，Unity会应用Htile Culling功能
- 此功能可以把因为Lens Distortion导致的，处于最终渲染帧外围的区域，在早期就剔除掉
- 可以剔除大约17%的像素，节省GPU pixel shader time
- 下图的紫色区域就是被剔除的区域：



Unity编辑器中VR项目演示





Thank you