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Unity Setup for Magic Leap One

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For CIM424/624 Augmented Reality
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Installing Lumin SDK and packages

1. Register an account on Magic Leap Creator Portal
2. Download Package Manager: https://creator.magicleap.com/downloads/lumin-sdk/overview
3. Double-click on the downloaded file to star the installation. Remember to launch package manager at the end of the installation.
4. Select the latest Lumin SDK. In the right window pane select Download & Install. Select "Apply Changes" to install the SDK. https://creator.magicleap.com/learn/tutorials/tutorial-getting-started-with-magic-leap-remote
5. In the right window pane select Open Folder. The Lumin SDK directory opens.
6. In the SDK directory, go VirtualDevice > bin > UIFrontend, and then open MLRemote.exe (Windows) or Magic Leap Remote.app (MacOS).
7. Under **Common Packages**, download and install C API documentation (optional)
8. Under **Unity Packages**, download and install **Magic Leap Unity Package** and **Unity API Documentation**

Magic Leap Remote (Simulator)
1. Start Magic Leap Remote by double-click MLRemote.exe (Windows) or Magic Leap Remote.app (MacOS). Note: The simulator should always be started before zero-iterating in Unreal or Unity.
2. Problems with Virtual Rooms (the following is a reply on ML forum):

the integrated Intel graphics chipsets don't provide sufficient 3D graphics "oomph" to drive Magic Leap Remote, and so we don't support them at all.

For macOS, you'll need a MacBook with either NVIDIA Geforce or AMD Radeon discrete graphics chips.

For Alienware, need to manually switch to NVIDIA card (some can do it with Fn+F7, or right-click the desktop -> NVidia Control Panel -> manage 3D setting -> Set OpenGL rendering to GTX card).

Load a Virtual Room in Magic Leap Remote
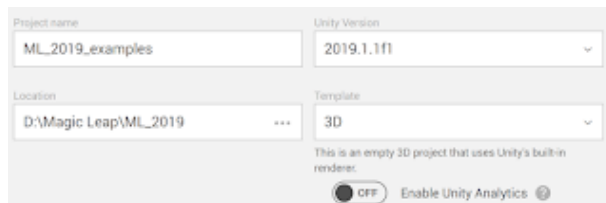- https://creator.magicleap.com/learn/tutorials/tutorial-getting-started-with-magic-leap-remote
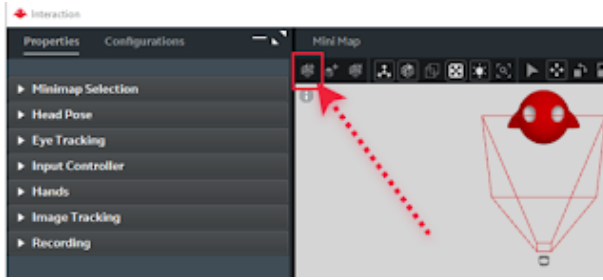
To load one of the default virtual rooms, navigate <Lumin SDK> > MagicLeap > mlsdk > v#.##.# > VirtualDevice > data > VirtualRooms > ExampleRooms. For Windows, it is usually under /Users/your_user_name/MagicLeap/mlsdk/v0.x.x/...

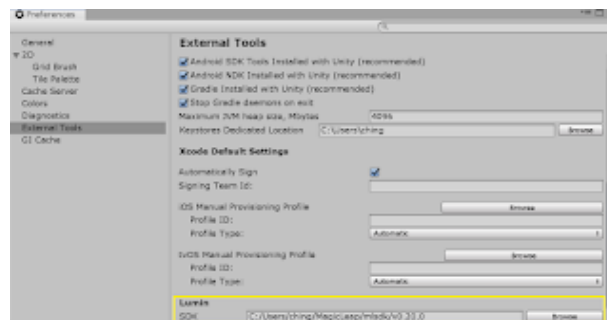## Installing and Configuring Unity

1. Download Unity 2019.1 from the Unity website.
2. To setup Lumin SDK path in Unity, open Unity (create a new project) and select **Edit -> Preferences**, select **External Tools** and browse the path to set it up for Lumin SDK.
3. Back to Unity, select **File -> Build Settings** to switch the platform to Lumin.

Create a new project in Unity 2019.1

Setting up the path for Lumin SDK in Unity
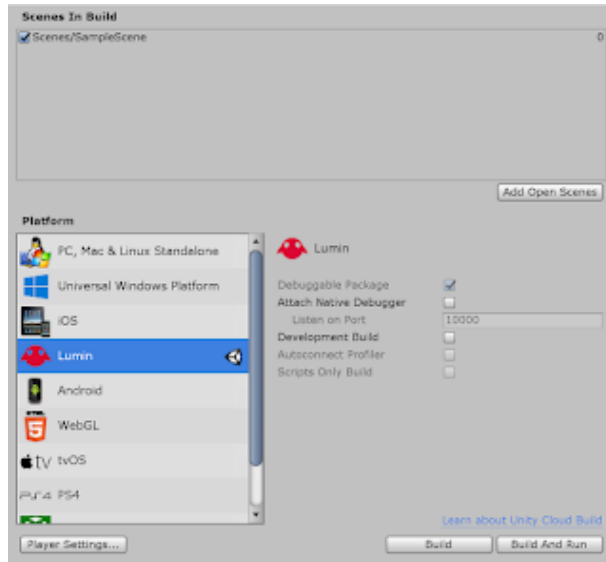
[http://4.bp.blogspot.com/-
BkBp3bGg7tk/XNBLV9VigII/AAAAAAAADh0/8EL5TgaTrgQmgrLUNevwKQ4QNl6U5a5uACK4BGAYYCw/s1600/f3.png]
Switch platform to Lumin for Magic Leap One

More information can be found here.
https://creator.magicleap.com/learn/guides/unity-setup [https://creator.magicleap.com/learn/guides/unity-setup]

[Deprecated] Download the Magic Leap Technical Preview (built against Unity 2018.1) from the Unity website.
https://unity3d.com/partners/magicleap/ [https://unity3d.com/partners/magicleap/] (scroll down to the bottom of the page to
download the latest version of Technical Preview).

Magic Leap Remote - Hello, Cube! Unity Edition
https://creator.magicleap.com/learn/guides/gsg-create-your-first-unity-app   [https://creator.magicleap.com/learn/guides/gsg-
create-your-first-unity-app]
- Set up a Magic Leap Unity Project (build setting, player setting)
Here are the steps to create a red cube in Unity:

1. Create a folder named Materials under Assets. Right-click in the folder and select Create-> Material to create a
   material and name it red.
2. Select Albedo in the Inspector, and click the color field to select color red by moving the point in the color wheel
   and panel.
3. Go to the menu and select GameObject - > 3D Object -> Cube to create a cube. Change its position to (0, 2, 2)
   and its scale to (0.5, 0.5, 0.5). Apply the material by dragging the red material from the folder to Material Rednerer
   -> Materials -> Element 0.
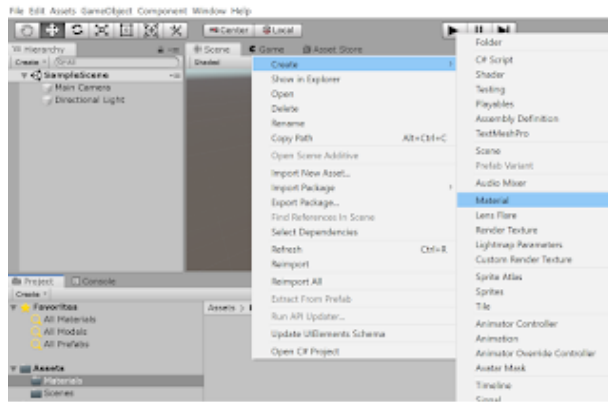
[http://2.bp.blogspot.com/-
T4gfVtxXYFQ/XNBPkxe4hKI/AAAAAAAADiA/IasvdTmfLpslZyLksZwmtDH9iJ2XTMAXwCK4BGAYYCw/s1600/f4.png]

Creating a red cube: Step 1 - creating a material.

[http://3.bp.blogspot.com/-
zQ4rKwYahgc/XNBQQCQY3iI/AAAAAAAADiM/kjNiNs9s6bIqcYlzb9T7DLUsDTN4gunLQCK4BGAYYCw/s1600/f5.png]

Creating a red cube: Step 2 - changing the color of the material.
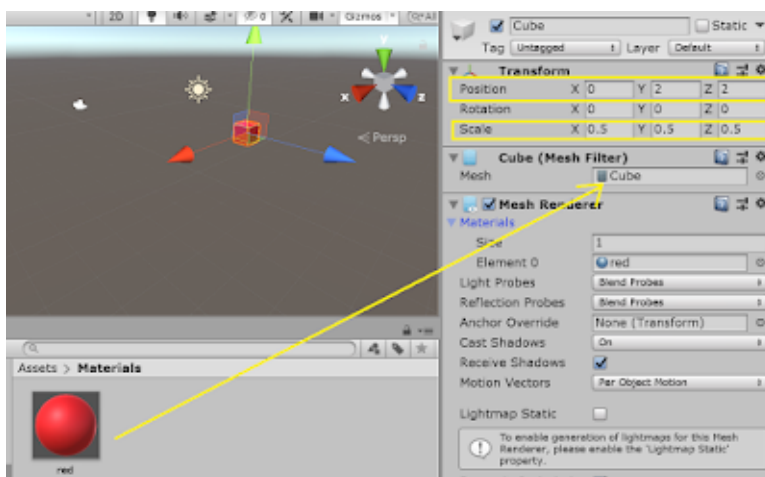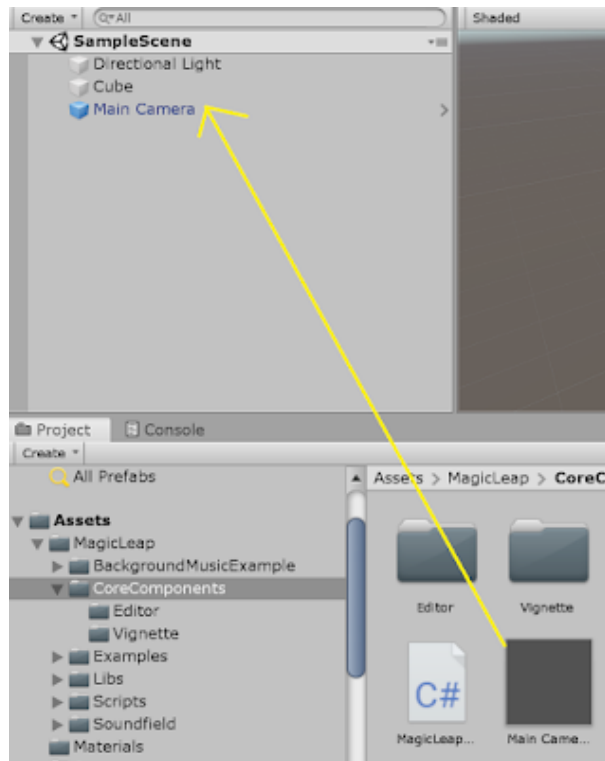

[http://1.bp.blogspot.com/-

Creating a red cube: Step 3 - creating a cube and change its properties.

Install the Unity XR Legacy Input Helper

Go to Unity's menu **Window-> Package Manager** and select **XR Legacy Input Helpers**. Click on Install.

Import the Magic Leap Unity Package and Change Main Camera

1. Go to Unity menu Assets -> Import Package -> Custom Package and browse to the folder where you saved MagicLeap.unitypackage. It is usually in this folder **Users/user/MagicLeap/tools/unity/v0.xx.0**. This step is important because we need to use Magic Leap camera prefab in any Magic Leap apps.
2. Delete the main camera in Hierarchy. In the Project panel, browse to Assets -> MagicLeap -> CoreComponents, and drag Main Camera to the Hierarchy.

Replace main camera with the Magic Leap Main Camera prefab.

Developer Certificates and App Signing

-    https://creator.magicleap.com/learn/guides/developer-certificates   [https://creator.magicleap.com/learn/guides/developer-certificates]

Create and download the certificate from the Magic Leap Creator portal. In the **Player Setting**, to go the section of Publishing Settings and browse to the folder where you save the certificate.
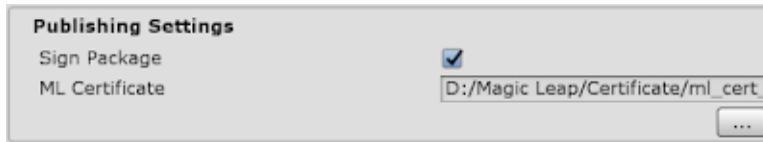
[http://3.bp.blogspot.com/-
fFrtXWBI7VQ/XNBW02ZZsgI/AAAAAAAADik/zFfApEEHqIgyJYdgT_ZSyIIWXxZV3igowCK4BGAYYCw/s1600/f8.png]

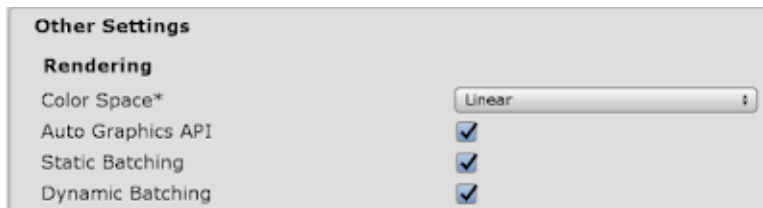Add Magic Leap certificate in Player Setting.

Other Player Settings

-   https://creator.magicleap.com/learn/guides/sdk-unity-player-settings-for-device
[https://creator.magicleap.com/learn/guides/sdk-unity-player-settings-for-device]

[http://4.bp.blogspot.com/-
fttaio0w9v8/XNBXWBnR6nI/AAAAAAAADiw/jTOfiug8c6k7GkeWNlru3pI76UL2-dQtQCK4BGAYYCw/s1600/f9.png]

Change Color Space to Linear in Other Settings
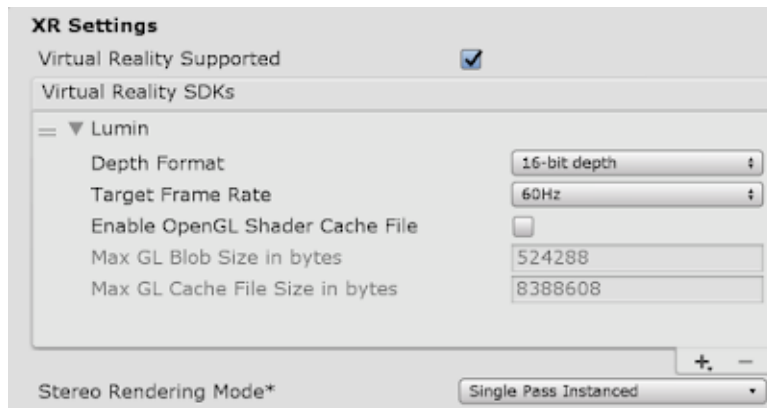
[http://4.bp.blogspot.com/-zTbwp5lBXoU/XNBXe-
TCeMI/AAAAAAAADi4/P-RFp1SX_K8DS-Rsi5f0hXvL59qMmQfUwCK4BGAYYCw/s1600/f10.png]

Select VR support and change Stereo Rendering Mode to Single Pass Instanced.

Adding Portal and Icon

https://creator.magicleap.com/learn/guides/portal-icon-guidelines   [https://creator.magicleap.com/learn/guides/portal-icon-
guidelines]

Magic   Leap   provides   a   sample   icon   [https://developer-content-
assets.magicleap.com/3kt5GMU7kcWsUQ22EyMw8S/6e0e868826518164d05f5bf800b989d1/SampleIcon.zip]   for you to use if
you just want to see how your app works on the device. This sample icon cannot be used for publishing your app on
Magic Leap World.

If you chose to use the sample icon, after you unzip the file, you can browse to these folders in **Player Setting, Icon**
section.
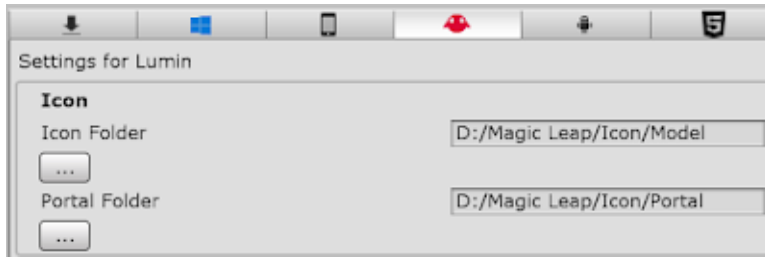
Adding the icon and portal.

Running/Testing Apps on Magic Leap One

1. Setting the device to Creator mode
https://creator.magicleap.com/learn/guides/setting-up-your-device-for-development

2. Build in Unity
Click Build and Run. Provide a name for the app for the mpk file and save it. Then Unity starts building the app and install this mpk file to the Lightwear.
If you have the Hub, you can connect it as shown in the following figure. You don't need the Hub to connect to a computer with a USB-C port.

Look around and you should be able to see your object somewhere in the room.

Testing the App on Magic Leap Remote

The result is seeing the red cube in the Eye View in Magic Leap Remote. Use keys w/s/a/d to move forward/backward/left/right and click-and-drag on mouse to look around.

[http://4.bp.blogspot.com/-
yWzp30ySdhI/W61Mu5Ndd1I/AAAAAAAAC74/Xzpf4EACeJQHpuFYRZvJ9UKDhYME_idmQCK4BGAYYCw/s1600/Screen%2BShot
%2B2018-09-27%2Bat%2B5.33.00%2BPM.png]

More Information about Magic Leap Apps

Magic Leap Lightpack LED Status Indicator
Check out this page to know what different colors mean on the Magic One Lightpack:
https://www.magicleap.care/hc/en-us/articles/360011316312-Lightpack-LED-Status-Indicator
[https://www.magicleap.care/hc/en-us/articles/360011316312-Lightpack-LED-Status-Indicator]

Magic Leap Apps
There are two types of apps in Magic Leap: landscape apps (more like desktop/mobile apps) and immersive apps
(such as a game). Multiple (same or different) landscape apps can run simultaneously so that users can put them
around the room. Immersive apps will suspend/block the other running landscape apps to provide a "full-screen"
experience.

Landscape apps
"Click the trigger to place an app, and its content will appear. You must place the app in your space before you can use
it. Remember that apps can be placed around physical objects that can occlude or block the app's prism. You can also
scale, rotate, push, or pull apps using the Control."

"Landscape apps are contained within a window called a Prism. Prims can be easily targeted, manipulated and placed
within the current landscape."

Immersive apps
All immersive apps must have an Exit menu to allow users to quick the app and return to the landscape.

Using Magic Leap One

[http://1.bp.blogspot.com/-MxU4pjyZtsw/W-Waj7rq8qI/AAAAAAAAC-o/EhfxGttoCA08nSUUb1saHBRTZh0OcBc_gCK4BGAYYCw/s1600/gsgd_magic_leap_control_diagram_numbered.png]

The picture above shows the Magic Leap remote. You can interact with it via 4 buttons: 1: touchpad, 2: bumper, 3: trigger, and 4: home button.

- To open the **Launcher**, double-press the Home button in order to select a new app to run.
- To **place a Landscape app** in the room, press trigger to do so.
- To **move a Landscape app** to another location, just look at the app and press the trigger to put the app in head-lock mode to move it. Or long squeeze and hold the trigger to extract and move an app; releasing will usually place an object
- Using the app

  - swipe the touchpad to move focus or scroll
  - pull the trigger to select content
  - press the home button to navigate back and cancel an action
  - use the bumper to pull out the Context Menu to show secondary actions and information

- Closing a Landscape app

  - Option 1. use the Context Menu to close the app. Apps should close immediately without asking users to confirm.
  - Option 2. double-tap the bumper

- Closing an Immersive app

  - Option 1. using the Home button to invoke an Exit menu
  - Option 2. press and hold the Home button.

- **Home button on the Control**

  - double-press: while in a landscape app, it will open the icon Grid (is it the same as Launcher?)
  - single-press: can be used as a "back" button
  - press and hold for 1 second: powers on the control
  - press and hold for 3 seconds: powers down the control

Software Tools

- Magic Leap Remote: the simulator allows developers to test their code without using the Magic Leap One
- Virtual Room Generator (in Magic Leap Remote): let developers create rooms and furnishings that can be loaded into the Magic Leap Remote Server as mesh data.
- Magic Leap Device Bridge (mldb): a command line tool that allows developers to directly communicate with Magic Leap One.

References:
1. http://codeofcodehall.co.uk/magic-leap/setting-up-the-magic-leap-lumin-sdk/
2. https://creator.magicleap.com/learn/guides/bootcamp-in-a-box
3. https://creator.magicleap.com/learn/guides/sdk-configuring-a-magic-leap-project-in-unity

Posted 12th December 2018 by Chinghua

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