

AS122449

Viewing Data from Different Sources in the HoloLens

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Learning Objectives

- Display Content in the HoloLens
- Identify hardware limitations and performance targets
- Learn which tools are available to reach performance targets
- Add basic input interactions in the HoloLens

Description

Virtual, augmented, and mixed realities are extremely promising technologies, but their adoptions are limited by the availability of content on their platforms. In this class, we'll bring data from different sources (Revit software, Fusion 360 software, SketchUp software, and so on) into Microsoft HoloLens to be viewed. Content coming from CAD applications is usually too heavy to be viewed on the HoloLens. We'll start with defining the key metrics to track for a smooth HoloLens experience; set ourselves some specific targets for content and hardware limitations; explore different options, tools, and workflows for optimizing content; and set up some basic interactions in Stingray software. Because of the limited availability of the HoloLens, this will be an instructional demonstration, but we invite you to bring your own HoloLens to follow along.

Warning: This handout assumes that the user is familiar with the basics of the HoloLens and won't go through things like navigation and selection within the Windows Holographic Platform.

Speaker(s)

David is a Software Engineer by training, with Master's in Virtual Reality, and an MBA from HEC Montreal. After spending a few years working in the video games industry, he joined Autodesk to kick-start the effort around the ambitious project that is LIVE and Stingray, focusing on Virtual Reality. His deep experience in Virtual Reality and real-time rendering technologies has served him well as a Product Owner, enabling LIVE to become the One-Click solution to VR that it is today.

Louis Marcoux has been a technical expert for 3D animation, visual effects and real-time rendering at Autodesk, Inc., since 2003. Prior to Autodesk, he was a real-time broadcast graphics specialist for 5 years, working with Discreet Logic and VertigoXMedia. Marcoux received a bachelor's degree in electrical engineering from Polytechnique in Montréal, and he also holds a Bachelor of Communications degree from Université du Québec à Montréal and Bachelor of Fine Arts degree in film production from Concordia University. Marcoux has been awarded Best Speaker at Autodesk University 3 times. For more information, you can go to: <http://area.autodesk.com/louis>



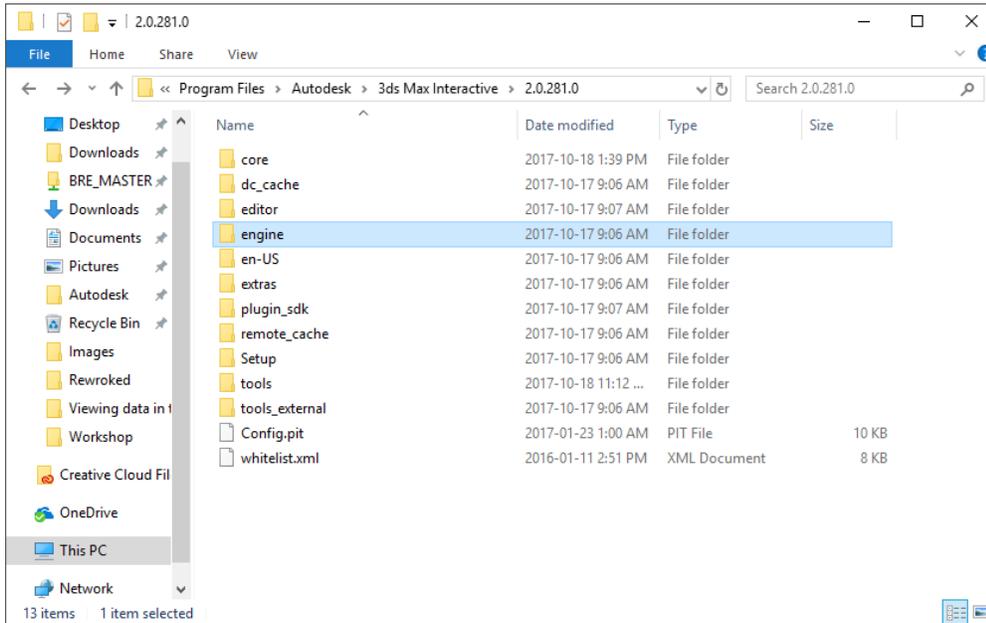
Let's get right into it!

Hololens support is an experimental feature in 3dsMax Interactive. As such, the official installer does not ship with the necessary Binaries to deploy a project to the Hololens. But no worries! Setting up your computer to run with the Hololens is fairly easy, and you won't require any developer tools!

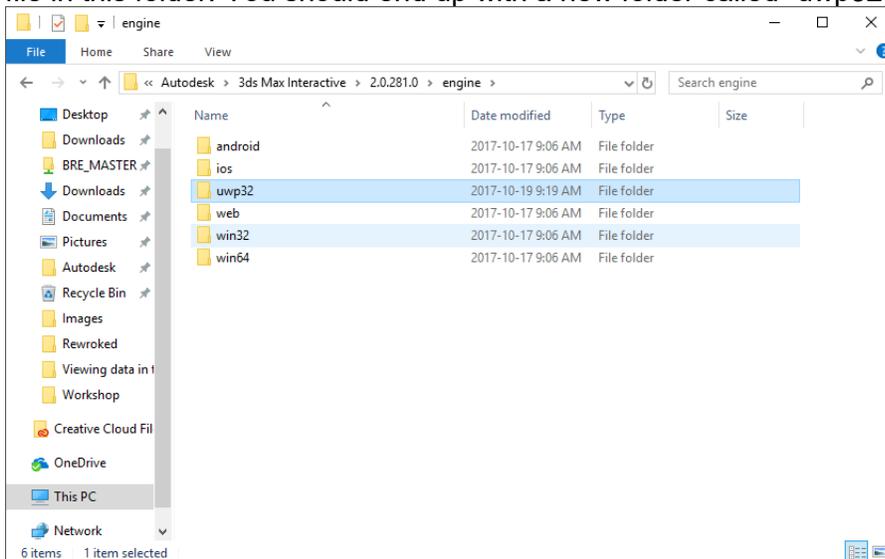
All Class Material, handouts and downloads can be found here:
<https://autodesk.box.com/s/uh6rhs62br9qqk8quof4ibe06pe3cg71>

Setting up your environment

The first step is to copy the engine UWP binaries so that 3dsMax Interactive can find it. Open a Windows Explorer window (Windows + E) and navigate to your 3dsMax Interactive install directory (typically C:\Program Files\Autodesk\3ds Max Interactive\2.0.x.0)



Next, navigate to the “engine” folder and extract the contents of the “Engine UWP Binaries.zip” file in this folder. You should end up with a new folder called “uwp32”:

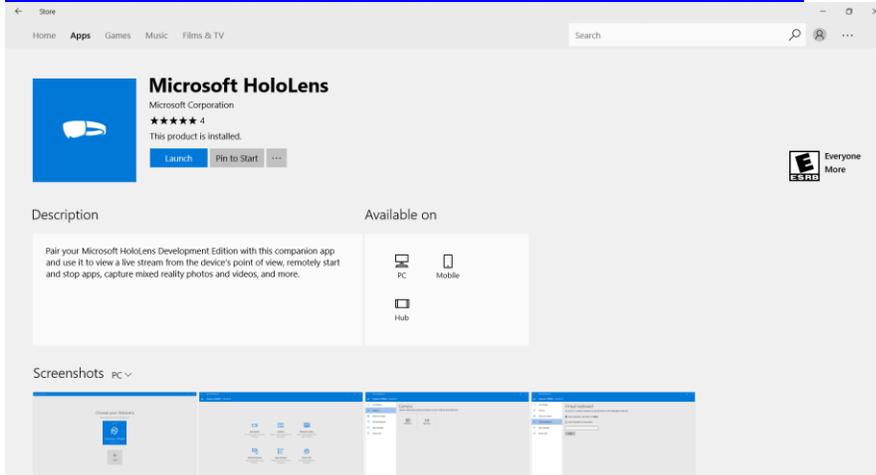


Setting up your Hololens

Download the Hololens App for Windows

First thing to do is open the Windows Store on your Desktop/Laptop computer and download the Hololens App from the Windows AppStore. You can simply search for “Microsoft Hololens” or follow this link:

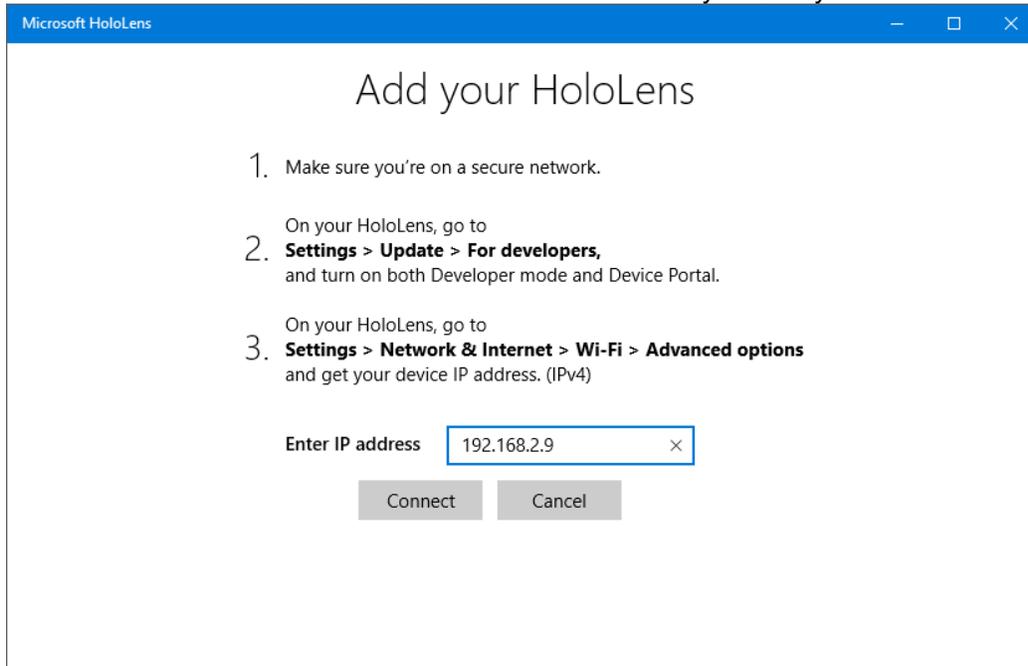
<https://www.microsoft.com/store/productId/9NBLGGH4QWNX>



Adding your device

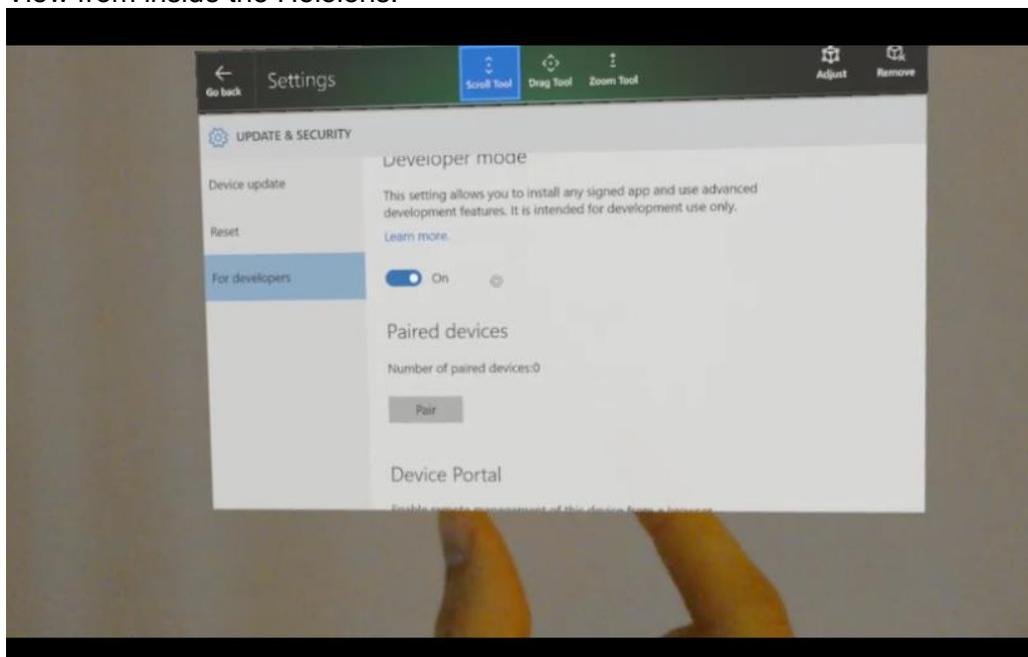
Launch the HoloLens App, and click on “Add a device”

Make sure to follow the on-screen instructions carefully to add your HoloLens.

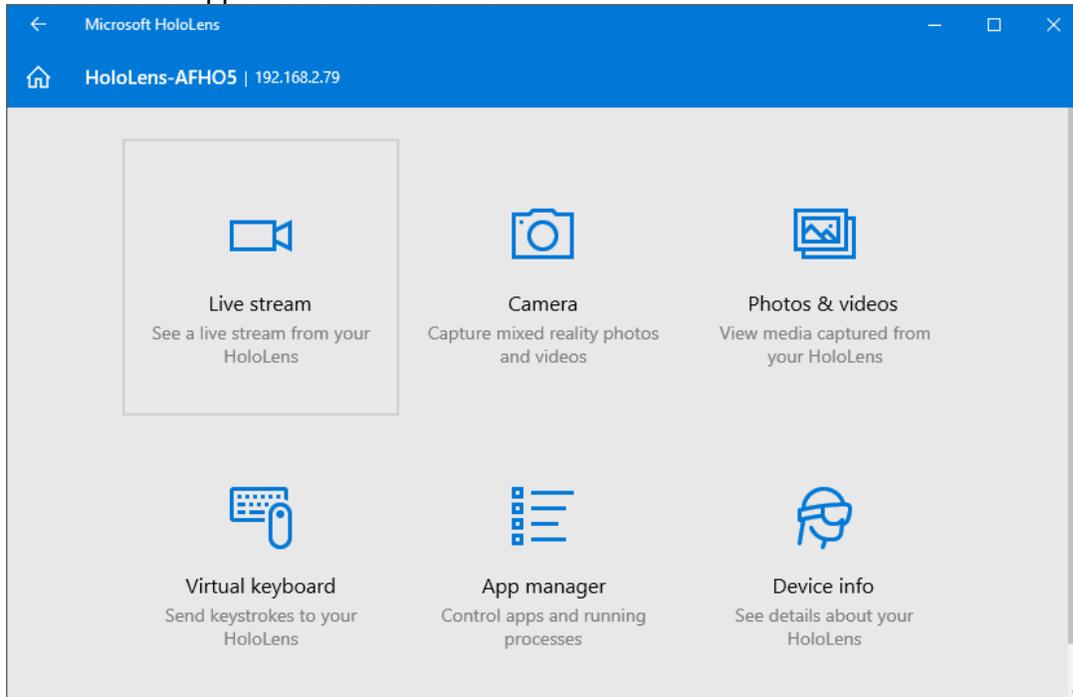


Protip: Don't forget to enable **both** Developer Mode and Device Portal!

View from inside the HoloLens:



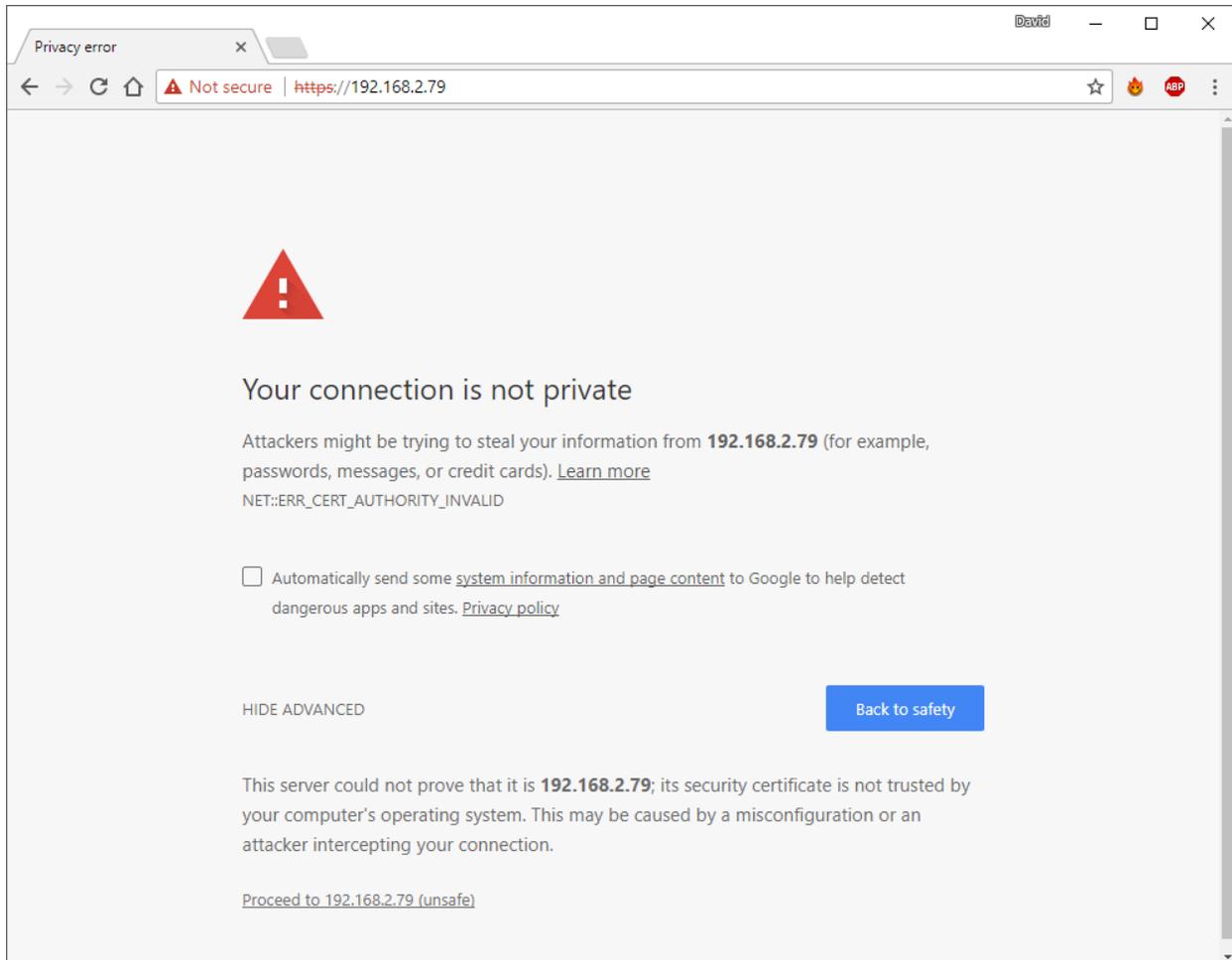
Now you should be able to connect to your device, and access a whole bunch of functionality. The HoloLens App should look like this:



Installing the Interactive App

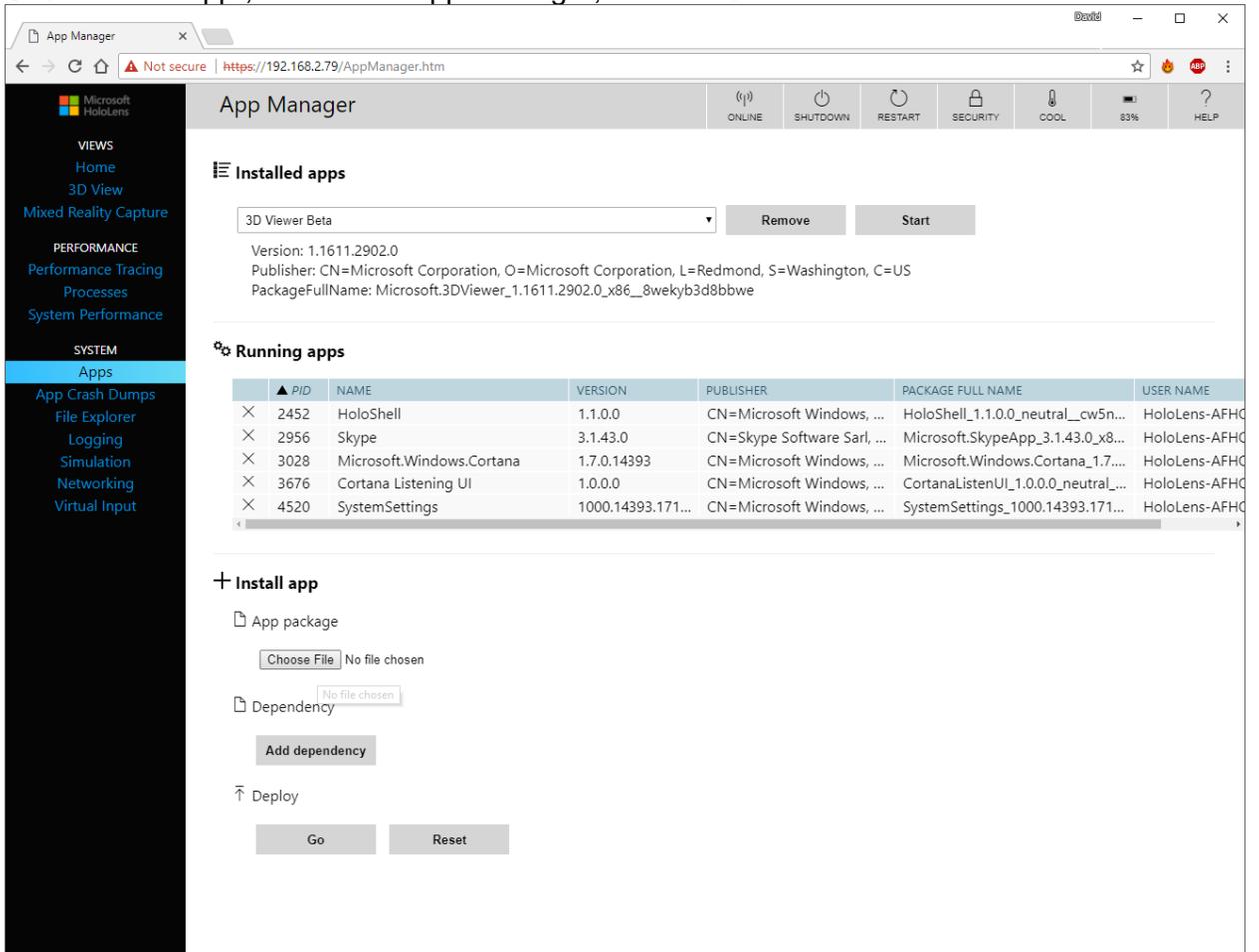
Next we will install the Interactive App on the Hololens. This isn't mandatory, but will greatly simplify our live and reduce iteration time later.

Open your favorite browser, and type in the Hololens IP address in the navigation bar. You will get a security warning, which you can safely ignore, by clicking on "Advanced" and selecting "Proceed to xxx.xxx.x.xx":



Enter your Hololens username and password. You now have access to an advanced view of your device! This nifty little tool lets you do all sorts of things, but we will use it to install a new App on our Hololens.

1. On the left-hand panel, select “Apps”, under “System”
2. Locate and extract the “interactive_app.zip” file you downloaded earlier
3. Under “Install app”, and under “App Package”, click on “Choose File”



The screenshot shows the App Manager interface on a Hololens device. The interface is divided into several sections:

- Left-hand panel (Navigation):** Includes options like Home, 3D View, Mixed Reality Capture, PERFORMANCE (Performance Tracing, Processes, System Performance), and SYSTEM (Apps, App Crash Dumps, File Explorer, Logging, Simulation, Networking, Virtual Input).
- App Manager Header:** Shows the current app selected (3D Viewer Beta) and buttons for Remove and Start.
- Installed apps:** Displays details for the selected app, including Version (1.1611.2902.0), Publisher (CN=Microsoft Corporation, O=Microsoft Corporation, L=Redmond, S=Washington, C=US), and PackageFullName (Microsoft.3DViewer_1.1611.2902.0_x86_8wekyb3d8bbwe).
- Running apps:** A table listing currently running applications.

▲ PID	NAME	VERSION	PUBLISHER	PACKAGE FULL NAME	USER NAME
×	HoloShell	1.1.0.0	CN=Microsoft Windows, ...	HoloShell_1.1.0.0_neutral_cw5n...	HoloLens-AFHQ
×	Skype	3.1.43.0	CN=Skype Software Sarl, ...	Microsoft.SkypeApp_3.1.43.0_x8...	HoloLens-AFHQ
×	Microsoft.Windows.Cortana	1.7.0.14393	CN=Microsoft Windows, ...	Microsoft.Windows.Cortana_1.7....	HoloLens-AFHQ
×	Cortana Listening UI	1.0.0.0	CN=Microsoft Windows, ...	CortanaListenUI_1.0.0.0_neutral_...	HoloLens-AFHQ
×	SystemSettings	1000.14393.171...	CN=Microsoft Windows, ...	SystemSettings_1000.14393.171...	HoloLens-AFHQ
- Install app:** A section for installing new apps, including fields for App package (Choose File) and Dependency (No file chosen), and an Add dependency button.
- Deploy:** A section with a Deploy button and sub-buttons for Go and Reset.

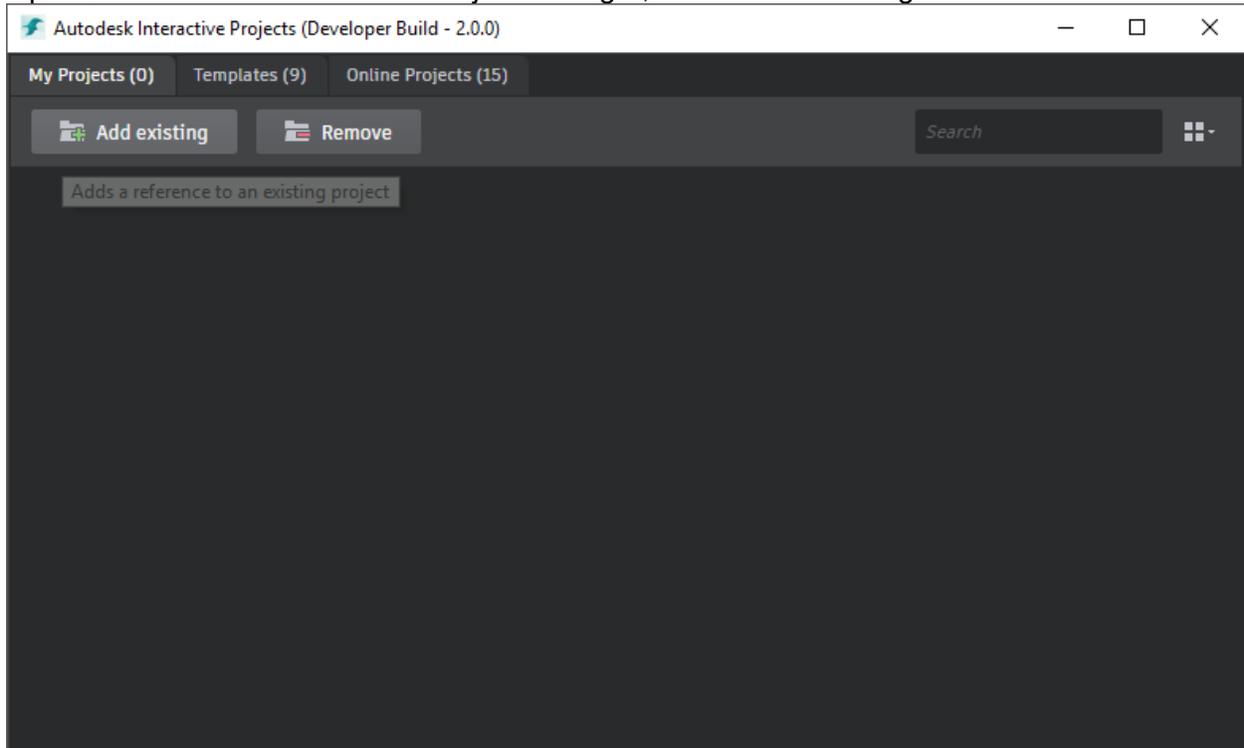
4. Browse to where you extracted the “Interactive_app.zip” file. Select the “main_uwp_1.0.1.0_x86_Dev.appxbundle” file.
5. Click “Go” under “Deploy”

This application will let us stream 3dsMax Interactive data directly to the Hololens, without having to deploy your project. It makes it a lot easier to work with the device, and lets us avoid Developer tools like Visual Studio!

Creating your Hololens Project

Extract the “hololens_project.zip” file you downloaded earlier. This contains a 3dsMax Interactive template project for the Hololens.

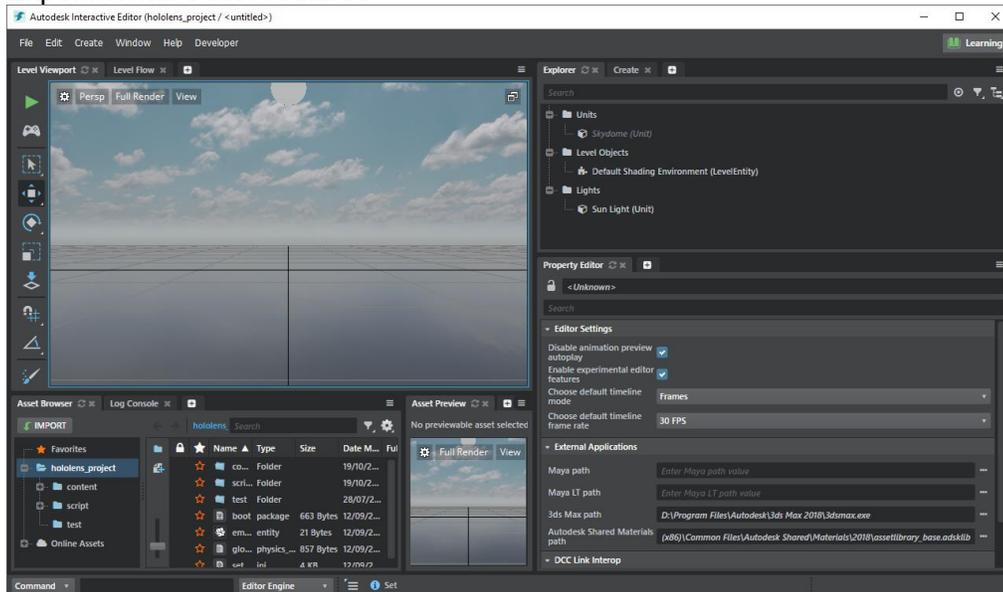
Open 3dsMax Interactive. In the Project Manager, select “Add Existing”



Browse to where you extracted the “hololens_project”, and select the “hololens_project.stingray_project” file.

The project will open and compile. While we are waiting for this, let's enable Experimental features.

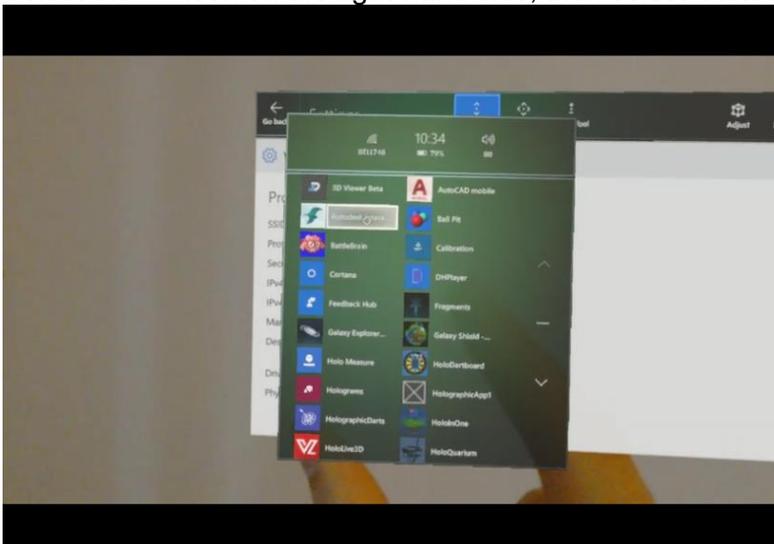
1. Under "File"->"Settings", select "Editor Settings"
2. In the Property Editor (by default on the right-hand side), select "Enable Experimental editor features"



You can now open a "Connections" tab, either by using the "+" icon next to the Property Editor tab, or by selecting "Connections" under the "Window"->"Deploy and Connect" menu item.

Once everything is done, we can go ahead and connect to our Hololens!

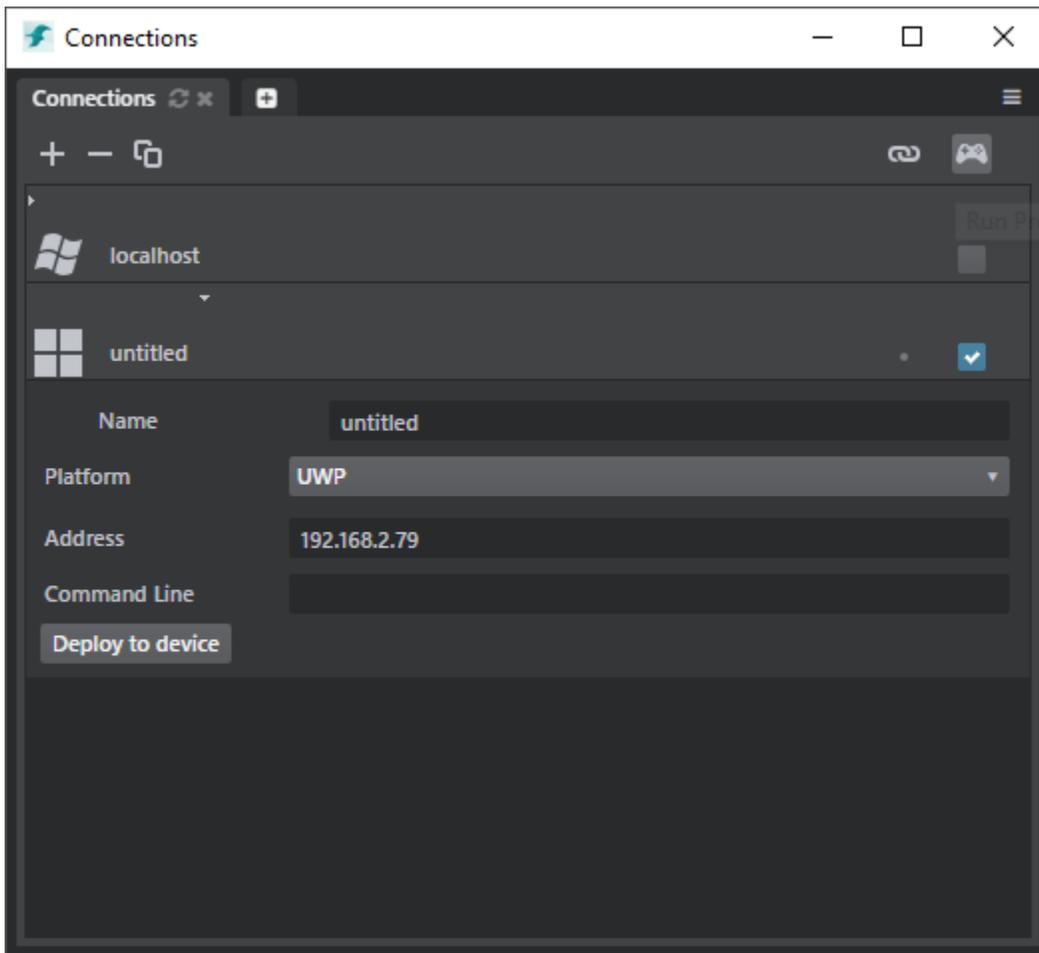
1. In the Hololens, access the start menu (with the Bloom gesture).
2. Select the "+" icon on the right-hand side, then select "Autodesk Interactive"



3. Pin the application to a wall. It will automatically start, and you will see the following popup. Do not close this popup yet!



4. In your 3dsMax Interactive “Deployer” tab, click on the “+” icon
5. Select the new connection, and change the platform to “UWP”. If you cannot see this option, make sure you enabled experimental features and close/reopen the connections tab.
6. In the “Address” field, enter the IP address (IPv4) of your Hololens, that you have identified earlier.
7. Make sure the check-box next to the new connection is selected. Then click on the “Run project” icon.



If all goes according to plan, 3dsMax Interactive will now compile your project, and send the data to the Interactive application running on your HoloLens. Note that you won't get any feedback in the HoloLens, but you can see the progress in the "Log Console" windows in the 3dsMax Interactive editor.

You can now close the "Waiting for connection..." windows in the HoloLens. The project will run when it is ready!

```
Log Console
Log Console
10:51:37 Data / FileServer: 192.168.2.79: Transfer in progress. File: uwp/data/a8/a871177dc6bf288e Rate: 1.79 MB/s
10:51:38 Data / FileServer: 192.168.2.79: Transfer in progress. File: uwp/data/a8/a871177dc6bf288e Rate: 47.45 KB/s
10:51:39 Data / FileServer: 192.168.2.79: Transfer in progress. File: uwp/data/96/962c40ad0e72c849 Rate: 1.01 MB/s
10:51:40 Data / FileServer: 192.168.2.79: Transfer in progress. File: uwp/data/96/962c40ad0e72c849 Rate: 1.32 MB/s
10:51:41 Data / FileServer: 192.168.2.79: Transfer in progress. File: uwp/data/a0/a06d5f4c72bade8c Rate: 525.03 KB/s
10:51:42 Data / FileServer: 192.168.2.79: Transfer in progress. File: uwp/data/e0/e0e2afc9e0061c5a Rate: 1.81 MB/s
10:51:43 Data / FileServer: 192.168.2.79: Transfer in progress. File: uwp/data/e0/e0e2afc9e0061c5a Rate: 1.72 MB/s
10:51:44 Data / FileServer: 192.168.2.79: Transfer in progress. File: uwp/data/e0/e0e2afc9e0061c5a Rate: 78.90 KB/s
10:51:45 Data / FileServer: 192.168.2.79: Transfer in progress. File: uwp/data/f6/f60f74c990be4504 Rate: 1.56 MB/s
10:51:46 Data / FileServer: 192.168.2.79: Transfer in progress. File: uwp/data/3b/3b2fe816a4752f5e Rate: 873.80 KB/s
10:51:47 Data / FileServer: 192.168.2.79: Transfer in progress. File: uwp/data/3b/3b2fe816a4752f5e Rate: 2.01 MB/s
10:51:49 Data / FileServer: 192.168.2.79: Transfer in progress. File: uwp/data/ef/ef6998f594e24985 Rate: 513.22 KB/s
10:51:50 Data / FileServer: 192.168.2.79: Transfer in progress. File: uwp/data/f1/f196831c50c9492e Rate: 816.19 KB/s
10:51:51 Data / FileServer: 192.168.2.79: Transfer in progress. File: uwp/data/45/45b41c162aad3ba4 Rate: 734.53 KB/s
10:51:52 Data / FileServer: 192.168.2.79: Transfer in progress. File: uwp/data/4f/4f8cf0595bb4acc1 Rate: 1.49 MB/s
10:51:53 Data / FileServer: 192.168.2.79: Transfer in progress. File: uwp/data/8c/8cdd9373781c8823 Rate: 454.81 KB/s
10:51:54 Data / FileServer: 192.168.2.79: Transfer in progress. File: uwp/data/3f/3f7b56a61e643737 Rate: 852.16 KB/s
10:51:55 Data / FileServer: 192.168.2.79: Transfer in progress. File: uwp/data/4b/4b7a8410e407b0ce Rate: 611.97 KB/s
```