Introduction: RGBD to VR

This application is a Virtual Reality (VR) demo that renders a live video from a color and depth camera in a 3D virtual environment. It uses a combination of OpenCV, a computer vision and machine learning library, and StereoKit, a mixed reality library for cross-platform VR/AR development. This application serves as a great example of combining computer vision and VR for immersive multimedia experiences.

Tools Required:

1. Orbbec Femto Mega Camera (a Depth and RGB camera with real-time streaming of processed images over Ethernet or USB connection.)
   Link: https://shop.orbbec3d.com/Femto-Mega

2. Meta Quest VR Headset (Application was tested on Quest 2 and Quest Pro)
   Link: https://www.meta.com/

3. It is recommended that you have a reasonably powerful Windows PC. PC with following minimum requirements is most:

   Processor Intel i5-4590 / AMD Ryzen 5 1500X or greater
   Memory 8 GB+ RAM
   Operating System Windows 11 64-bit
   USB Ports 1x USB-A or USB-C port 2.0 or 3.1 (Preferred: USB-C 3.1, it provides more power and has much higher bandwidth)

   You will need one of the following GPUs to run the application.
   Currently, the graphics cards compatible with Oculus Link are:
   - NVIDIA GeForce GTX 1650 Super. NVIDIA GeForce GTX 1660. NVIDIA GeForce GTX 1660 Ti. NVIDIA GeForce RTX 20/30/40-series (all)
   - AMD 400/500/5000 Series. AMD Vega Series.

Installation Guide:

Once you have the Windows PC that meets the requirements, please follow this guide for installing the required software and the application.

1. Visual C++ Redistributable Package (x64). (https://aka.ms/vs/17/release/vc_redist.x64.exe)

2. Orbbec Camera Drivers for Windows (https://dl.orbbec3d.com/dist/drivers/win32/astra-win32-driver-4.3.0.20.zip)

3. Oculus Desktop application (https://www.oculus.com/download_app/?id=1582076955407037)

4. RGBD2VR Application (Once you download, unzip the file, you should get a folder with the application and required libraries) (https://github.com/OrbbecDeveloper/RGBD2VR/releases/download/v0.1.1/RGBD2VR.zip)

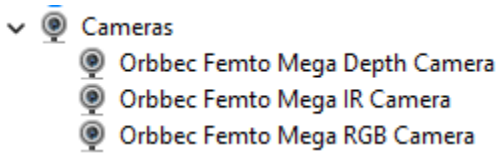
Use Guide:

1. Install all necessary software and hardware.
2. Plug the camera into the PC, use the USB C to USB C cable that comes in the box. Other cables might not give the same speed.
3. Open the Oculus Desktop App, sign in with a Meta account.
4. Navigate to settings within the Oculus App.
5. Click on the General Tab.
6. Enable Unknown Sources.
7. Turn on the VR Headset.
8. Setup the VR device with a Meta account (first time setup).
9. Plug the Headset into the PC.
10. Once the Headset is plugged in, you might see two pop-ups on your headset display one after another depending on the settings:

a. The first pop-up is “Allow connected devices to access files?” which you can give access to.
b. Second would be “Enable Quest Link” which you **MUST** enable for the application to work.

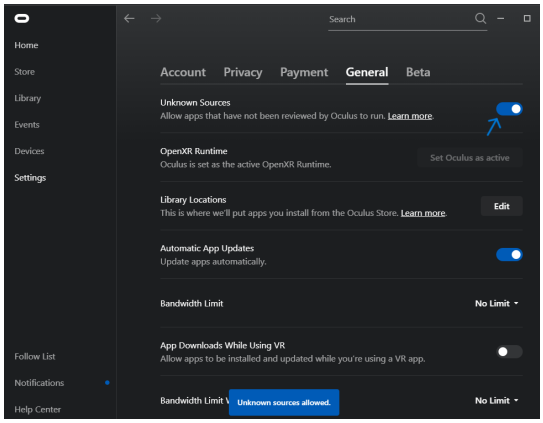
11. If you didn’t select “Enable” at first try, you can manually enable the link from oculus settings, once you enable you will see the Oculus App starting and running automatically on your windows PC if it has not been opened yet. Make sure your headset gets recognized in the Oculus App on the desktop under “Devices.”
12. After completing the previous steps and you are inside the Oculus Link in your headset, open the RGBD2VR.exe file on your PC. The application should now be running and the video gets displayed in the VR headset.
13. Verify that everything is working correctly.

Image Guide:

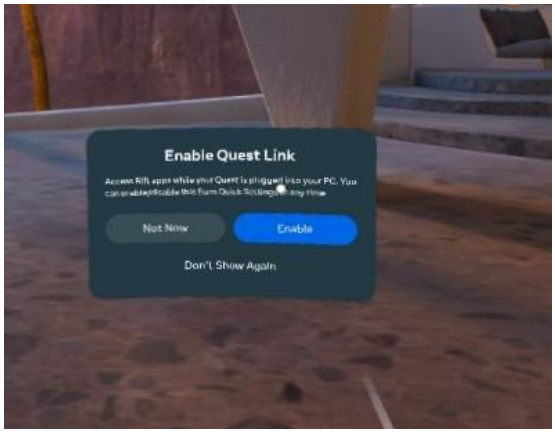


- If your camera is recognized properly, you should see these devices in your device manager, refer to the attached image for reference.

- This is how your settings should look after you enable the “Unknown Sources”



- On your VR headset, you will see pop-up like these to enable the link



- You can manually turn on and off the link, here is how it looks: