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Get That Animation into VR: A Case Study of Capitol Tower

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TILTPIXEL

Learning Objectives

- Discover VR
- Learn the different uses and applications with VR
- Learn how to use VR in your design or presentation
- Understand the process involved in creating an immersive 360 tour

Description

So you're familiar with architectural renderings and know a little about virtual reality (VR), but want to see how they're used in a real-world example. This presentation goes through the basics of VR, discussing quick principles for setting up a scene for 360 panos showcasing Houston's Capitol Tower, designed by Gensler and currently under construction with Skanska. This case study goes behind the scenes to show how TILTPIXEL created an immersive 360 VR tour using all the bells and whistles of leading animation techniques, and applying them to a 360 environment. We will look at 3ds Max software and V-Ray, as well as combining green-screen footage into a 360 image with compositing techniques. The end result is an online, interactive, 360 video tour that can be viewed on virtually any platform.

Speaker

Ramy Hanna is the co-founder of Tiltpixel, a full service creative studio and a leader in architectural visualization. He has been in the arch-viz industry for the last decade creating architectural renderings and animations. He is familiar with various 3D software and a variety of rendering engines. He also dabbles in architectural photography and has had the privilege to win several design awards including AIA Design Awards. He has also spoken at several speaking engagements such as Autodesk University, RTC, and VisDay. Ramy is an online instructor for The Gnomon Workshop and Blackspectacles.com. Since 2009, he has been on the 3dsmax beta team providing input into the design of 3ds Max software. In 2003, he was involved in an animated short nominated at SIGGRAPH, and in 2006 his animated short played in AMC movie theatres nationwide.

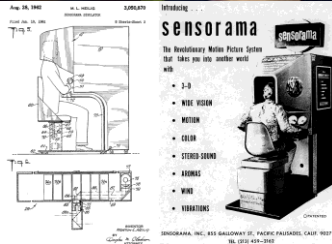
What is VR?

The definition of VR is defined (from Cambridge Advanced Learner's Dictionary & Thesaurus) as:

Abbreviation for virtual reality: a set of images and sounds, produced by a computer, that seem to represent a place or a situation that a person can take part in: the VR experience.



Initially you may think of VR as an experience on the computer using a headset, but according to the definition, interactive experiences have been around for decades.



Back in 1962, the Sensorama was a 3D experience that included motion, color, stereo-sound, aromas, wind, vibrations, etc.



The ViewMaster allowed you to view an image in stereo which is the same principle as a current day VR headset



Video games early on adapted ways for participants to interact with the game beyond the traditional joystick / controller such as powerpads, blasters, powerglove, etc.

What is AR?

AR is abbreviated for Augmented Reality. AR is a technology that superimposes a computer-generated image on a user's view of the real world, thus providing a composite view.

As VR develops further along, the future of this technology will fall into the AR realm where multiple people can interact with each other in realtime, but also within the real world and all see something together that does not exist in reality.

Applications of VR

There are many applications of VR we will go through a few of them.

Training

VR can be used in the medical industry where doctors can practice surgery on a virtual human before performing the procedure in real life. There is a UTMB pilot program, where the goal of the study is to test various technologies that could be employed in the tele-guidance of non-trained personnel in the performance of simple anesthesia and surgical procedures on training mannequins and simulation tissues.

The military often use VR as a training tool as well. For example, the 1st Stryker Brigade Combat Team “deployed” U.S. armed forces on July 14th 2016 to secure an oil pipeline in the imaginary country of Atropia.

Therapy

VR can aid in physical therapy for children and adults. VR Kids allows children with weaker immune systems that are unable to leave hospitals to view experiences with the use of headsets. Also researchers in the U.S. have developed an ingenious system that uses VR to help prevent falls by detecting and reversing balance impairments in elderly people.

Entertainment

In 2015 VR was being incorporated into music videos for more than a passive experience. Also ABC incorporated 360 / VR with Dancing with the Stars. VR gaming is becoming more mainstream now as well.

Design









Also, VR can be used as a design tool for interior designers, architects and developers. I can be used to evaluate the state of a new design, or it can be used to create a new design within a virtual 3d space.

Sales

VR can also be used to sell a product or a building. There are technologies such as Matterports that are becoming popular within the real-estate industry to sell interior spaces.

VR Headsets

This list should help guide you with what headset may be best for you. While I've listed them here, the features are much more extensive than I've listed and there are so many charts out there. These I feel are the most common headsets:

		Mobile	Tethered	AR	3D Sound	Price
	Oculus Rift		✓		✓	\$400-\$600
	HTC Vive		✓			\$500
	HTC Vive Pro		✓	✓	✓	\$800
	Playstation VR		✓		✓	\$300
	Oculus Go	✓				\$200
	Samsung Gear VR	✓				\$20 (requires phone)
	Microsoft HoloLens			✓		\$3,000
	Google Cardboard	✓				\$10-\$15

Capturing 360 content

These days 360 cameras are much more available with prices of dropping. The cameras that we use in our office:

Nikon KeyMission 360



This camera does a good job with small on-site visits, mostly for scouting trips. We don't typically use it in production, but it's great for drafts. This one runs roughly \$500.

Insta 360

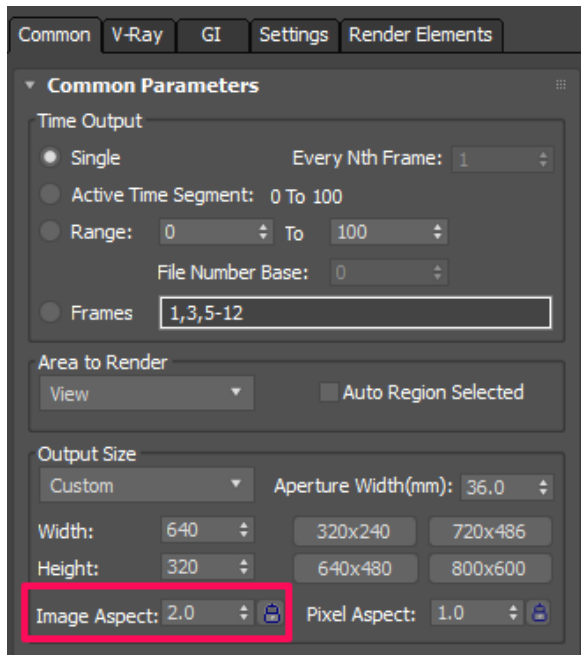


This camera shoots 360 stills up to 12K with the new firmware and 360 video up to 6K. This camera is a high end 360 that runs roughly \$3,000.

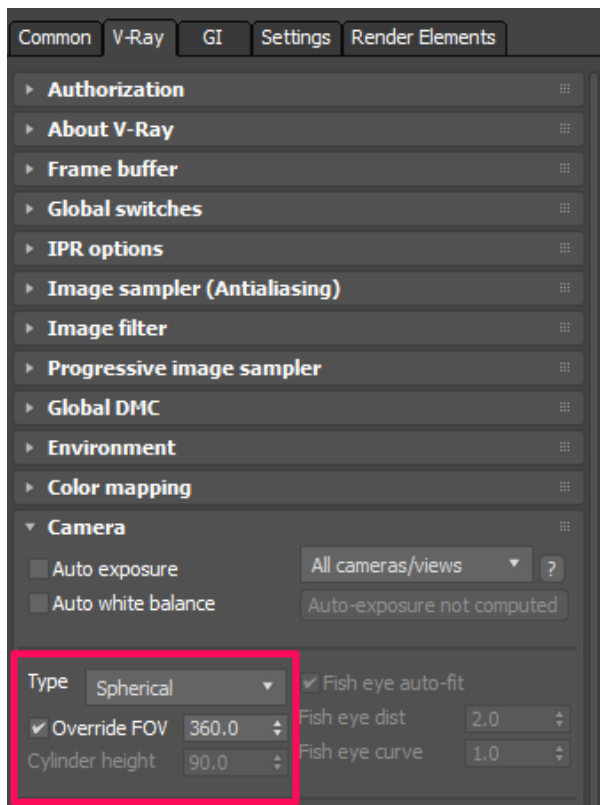
There are many other 360 cameras out there, but the ones I've listed are the ones we use that have been tested to work well.

How to create a tour in 3D

It's one thing to create these 360 images with a camera, but how is it done with a 3D rendering? It's actually much simpler than it looks and is not as daunting as you may think. I'll walk you through the set up we use in 3ds Max and Vray:



There are mainly 2 render settings that are needed to be able to create 360 renderings out of 3dsmax and Vray, Both of them are in the Render Settings window. First under the Common tab, go to *Image Aspect* and set it to 2.0



Then go to the V-Ray tab and open the *Camera* rollout. Change the Type from *Default* to *Spherical*, Check *Override FOV* and set the amount to 360.

Now that we have the render settings set, there is one more factor to consider; the camera height. It is very important for accuracy and realism that the camera is set to true eye height. This can be tricky as people are different heights, so an average of 6' is where I usually set the camera to.

That's it! Now when you render, it will create a spherical 360 image that can be used into a VR or 360 tour. But now that we have our images, how do we use them?

KR Pano

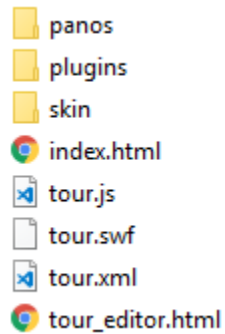
I use KR Pano for our 360 tours. There are several reasons we use it:

- It's a web-based tour platform so there is no software installation for the viewer
- It works on PC, Mac and mobile
- It's customizable
- It supports VR headsets

To create a multi-res tour, select all your spherical images that you created, make sure they're all the same resolution or the tour won't be created correctly. Click and drag the images onto the *MAKEVTOUR (MULTIRES) droplet.bat* file.

ocal Disk (C:) > Program Files > krpano-1.19-pr15					Search krpano
Name	Date modified	Type	Size	Owner	
docu	4/3/2018 2:32 PM	File folder		Administrators	
templates	4/3/2018 2:32 PM	File folder		Administrators	
viewer	4/3/2018 2:32 PM	File folder		Administrators	
Convert SPHERE CUBE Droplet.exe	1/12/2018 3:37 AM	Application	76 KB	Administrators	
documentation.html	9/15/2017 3:35 PM	Chrome HTML Do...	1 KB	Administrators	
ENCRYPT XML droplet.bat	3/20/2018 5:05 AM	Windows Batch File	1 KB	Administrators	
examples.html	9/6/2017 4:25 AM	Chrome HTML Do...	1 KB	Administrators	
krpano Testing Server.exe	3/28/2018 4:06 PM	Application	3,347 KB	Administrators	
krpano Tools.exe	3/28/2018 4:06 PM	Application	64,888 KB	Administrators	
krpanotools32.exe	3/28/2018 4:03 PM	Application	1,695 KB	Administrators	
krpanotools64.exe	3/28/2018 4:05 PM	Application	1,963 KB	Administrators	
license.txt	12/31/2017 6:10 PM	Text Document	10 KB	Administrators	
MAKE PANO (FLAT) droplet.bat	12/8/2014 7:20 AM	Windows Batch File	1 KB	Administrators	
MAKE PANO (MULTIRES) droplet.bat	12/8/2014 7:20 AM	Windows Batch File	1 KB	Administrators	
MAKE PANO (NORMAL) droplet.bat	12/8/2014 7:20 AM	Windows Batch File	1 KB	Administrators	
MAKE VTOUR (MULTIRES) droplet.bat	11/17/2016 12:23	Windows Batch File	1 KB	Administrators	
MAKE VTOUR (NORMAL) droplet.bat	11/17/2016 12:22	Windows Batch File	1 KB	Administrators	
MAKE VTOUR (VR-OPT) droplet.bat	11/17/2016 1:54 PM	Windows Batch File	1 KB	Administrators	

Windows will compile and create a folder in the same location as the jpgs with the following layout. You can use the *tour_editor.html* to edit the tour, hotspots, locations of images, etc.



Editing the html and xml files further can allow you customize certain factors of the tour. You can upload this folder onto a web server and it will then be online for anyone to view.

To view the Capitol Tower tour, here's the url: <http://tiltpixel.com/vr/capitol/video-rt>

If you have any questions about creating your own tour feel free to contact me.



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