

From First Line to Final Design: VR as the Ultimate Creative Medium

Alex Coulombe
Agile Lens: Immersive Design



Learning Objectives

- Understand the strengths of designing in VR over traditional methods
- Learn how to communicate design intent with relatively simple VR sketches
- Learn how to use VR at every stage of the design process
- Learn how to cycle a VR methodology into existing workflows with Autodesk products

Description

Ever want to see virtual reality's (VR's) utility beyond glorified renders? VR's veracity of scale and presence provides entirely new creative capabilities. Before spending a dime, designers can iterate through ideas and then communicate them to clients and collaborators with incredible clarity at all stages of project development. Plans, sections, and even renderings of 3D models are all 2D representations of 3D space developed in 2D media. Only VR provides a fully 3D representation of 3D space, letting you design in a medium remarkably close to the final product. Drawing on his experience leading a VR consultancy, Alex Coulombe will show you how to take full advantage of VR as a practical, fun, and engaging new tool that leads to more confident choices, clearer communication, and better design: learn how to design from within VR itself; cycle a project through VR across a workflow of VR design tools, Revit, 3ds Max, game engines—then rinse and repeat; and unleash your inner creative!

Your AU VR Expert

Alex Coulombe is the Creative Director of Agile Lens: Immersive Design, a new virtual reality consultancy specializing in custom immersive technology solutions for architecture and design. He's been using VR since the Oculus Rift DK1, when he pioneered a workflow at the architectural consultancy Fisher Dachs Associates to test theatre sightlines. Since then, he's worked on myriad projects for which VR was uniquely suited to solve a problem. Alex is a strong advocate of using VR beyond simple presentations and takes a holistic approach to VR's capabilities throughout the design process. Currently his company is focused on developing new tools and experiences for Google Daydream, GearVR, Oculus Rift, HTC Vive, Windows Mixed Reality, and WebVR.

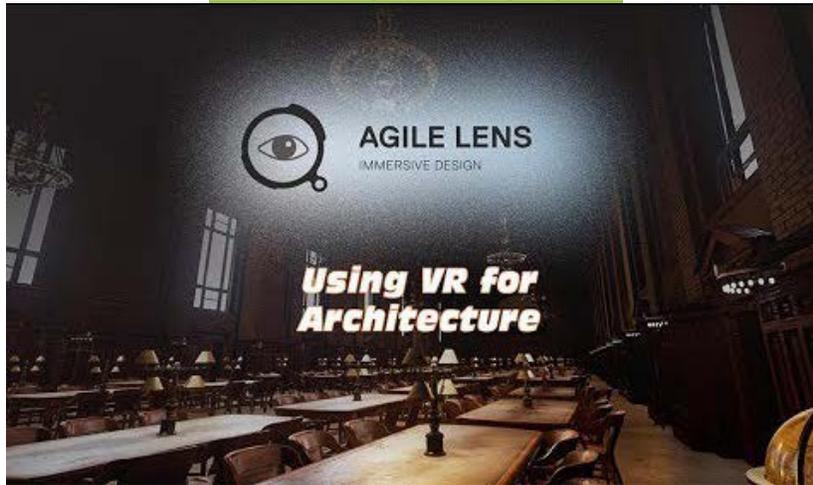
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Before we begin...

VR loses some of its power when presented in 2D up on a screen. Periodically throughout this presentation, I will point to a section of this simple WebVR demo to further illustrate concepts. Immerse yourself in them!

<https://tinyurl.com/propelal>



Introduction: Why Am I Talking to You?

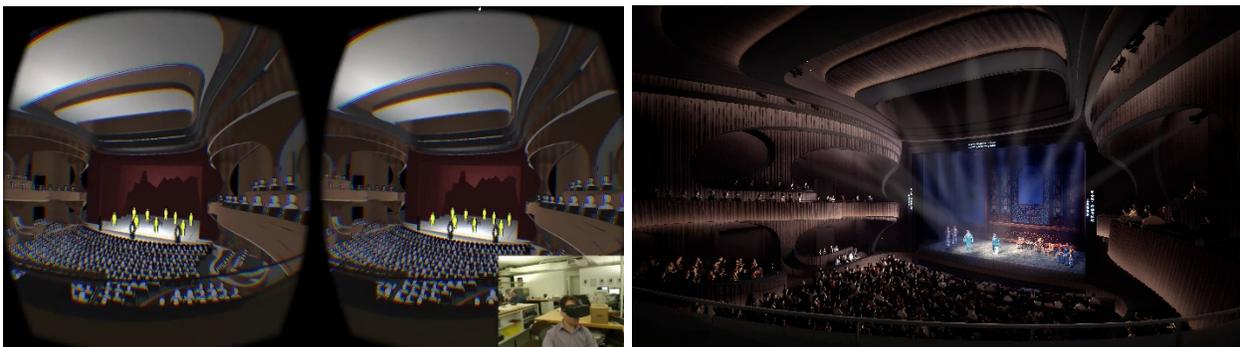
I love VR. I'm also disappointed by VR; not by its potential, but by its application. VR is the most potent design tool we've ever had, but right now it is relegated primarily to marketing and review. I am here right now because I want as many of you as possible to add these tools to your toolbox.



How I Got Into this Whole VR Thing

"Our department is confused as to how you exist." — Lauren Tracy, 2008

My first professional use of VR: testing views from the seats throughout a theatre design project.

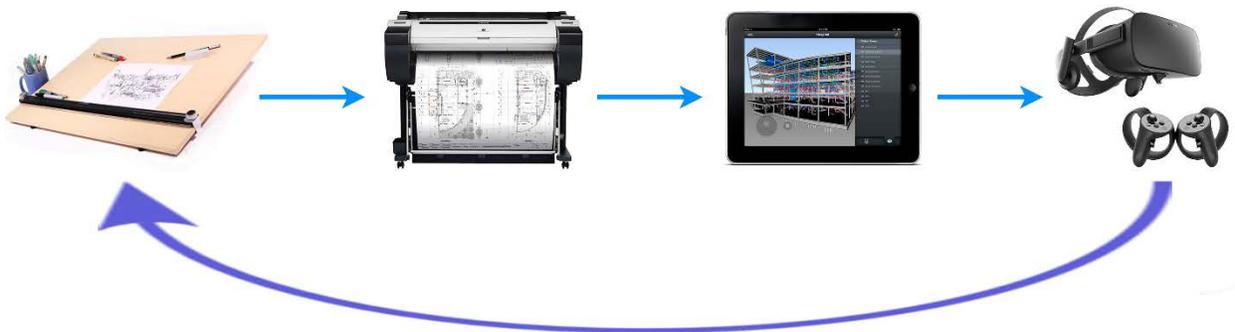


Rendering: Bing Thom Architects

At [Fisher Dachs Associates](#), VR became part of testing: sightline, room configurations, materials, and lighting. Eventually we began using it for raw design. These methodologies quickly became relevant for anything from hospitals, to furniture manufacturers, to corporate training, to real estate. To bring this work to a wider audience of clients and designers, we formed [Agile Lens: Immersive Design](#).

Designers Have it Rough

From Imhotep in 2600 BC to the mid-20th century, designers designed by drawing. Then in the 1970s, 80s, 90s there was suddenly a big push into CAD, and then in the 2000s we added BIM. People are hesitant about learning to design with VR because it seems like yet another big learning curve. In practice, it is not.



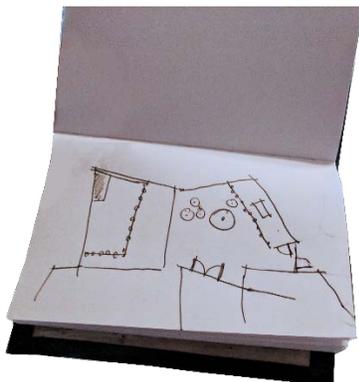
VR is a back to basics approach

Instead of keyboard shortcuts, elaborate menus, and drawing with a bar of soap (your mouse), there's a couple of new buttons to learn and then you're off to the races — and back to drawing with your hands. Only now, you're in an immersive work environment with a third dimension unbound by the laws of physics.

Why Design in VR

Communicating design intent is easiest in a fully-immersive 3D environment.

- You can scale your design from the size of a dollhouse to its true size.
 - [WebVR: choose 'Scale & Light: Yale Schwarzman'](#)
- In a few sketched lines you have an immersive experience.
 - [WebVR: choose: 'Sketching on Revit'](#)



VS



- Put on a headset and immediately have a sense of the status of the project.
- Instead of trying to make sense of a 2D abstraction, people can move through and manipulate the design itself.
- People *get it*, and with that...

Decisions are made quicker and with more confidence.

Here's a salesman-y pitch:

Save time, save money, design better.

Here's some practical advice:

Any time you might be working through an idea in a sketchbook — try it in VR instead.

Any time you might be revising an existing idea with tracepaper — try it in VR instead.

Designing in VR: Case Studies

VR works for every stage of the design process, and in most cases the learning curve is not as steep as you may think.

Theatres

When Fisher Dachs Associates started to use VR, they found design decisions were being made faster and with more confidence.

And just as much as VR is great for bringing confidence to an idea, it's also great for convincing clients and collaborators not to go forward with a bad idea:

WebVR: choose 'Acoustic Panel Study';

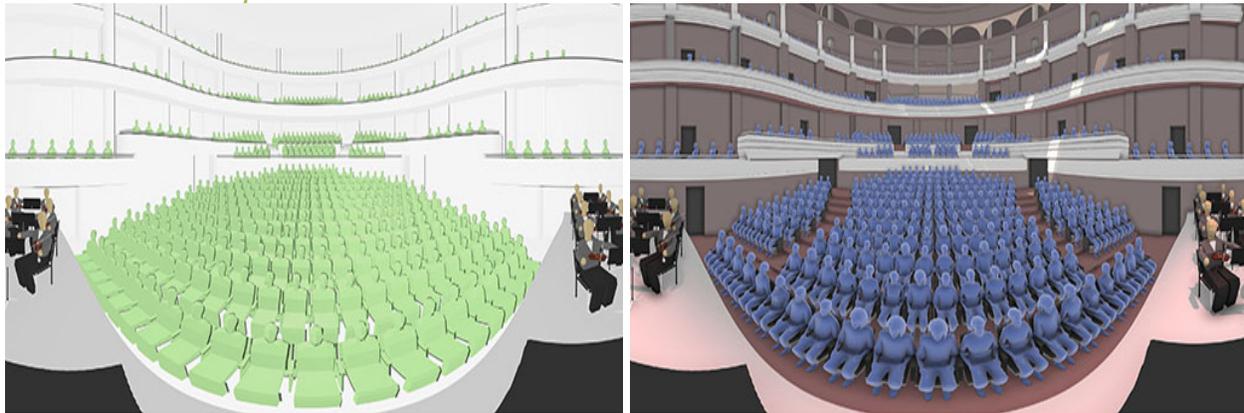


Chronologically, here's the uses we organically found for VR:

Sightlines

Testing the quality of theatre views.

WebVR: choose 'Concept / Refined Theater'



Theatre Productions

This VR app tested a variety of options for Kenneth Branagh's production of *Macbeth* at the Park Avenue Armory, a performance space that takes up an entire New York City block.



Photo: Steve Mentz

Architectural Design Options

Programming different options for theatre balconies, aisles, stages, and looking at how a design progresses from beginning to end. This soon expanded to additional typologies.

Architectural Projection

This VR app tested projector sightlines for the Ed Sullivan Theater before Stephen Colbert started at The Late Show.



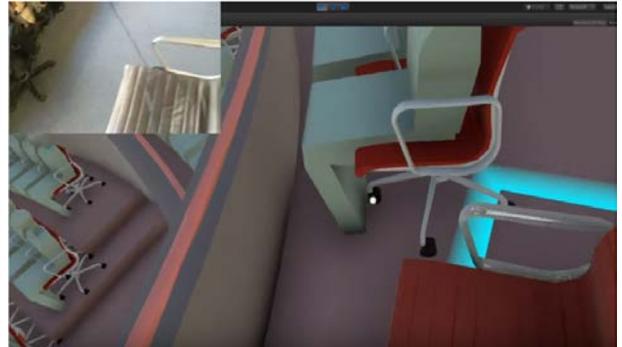
Set Design

Demo given where set designers drew on the stage for the yet-to-be-built Rice University Music and Performing Arts Center. They could then share it in the context of the rest of the theatre.



Asset Selection

Vive tracker used to help pick out a chair, allowing you to stand up and sit down easily by giving the real chair presence in VR.



Competitions

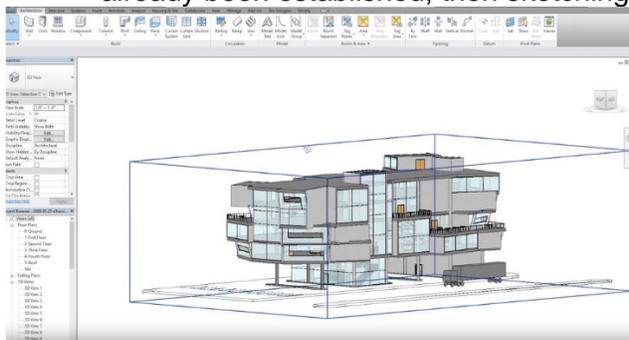
VR done well can help you stand out from the competition. Who wants to look at a flat sketch of a design proposal when they could physically walk around a sketch of the finished idea? Or experience a design in its context at a myriad of scales?

Case: Daydream app for a design firm presenting an urban proposal involving information at key intersections of a city. They didn't know what the information would be, so I set up a Mad Libs generator as an engaging placeholder.



Design Iterations

- [Revit Live](#) and programs like it allow for jumping directly into VR from any stage of a project. Some, like [Visible](#) or [Prospect](#), even allow multiple simultaneous users.
- VR can be great for porting in the 'known' elements when some parameters have already been established, then sketching new ideas on top (think 3D tracepaper).



WebVR: choose 'Sketching on Revit'



Case: from VR sketch, to VR massing study, to iterative stereo 360 renders, to a fully walkable, interactive Daydream experience. You can even change colors and move the furniture around.

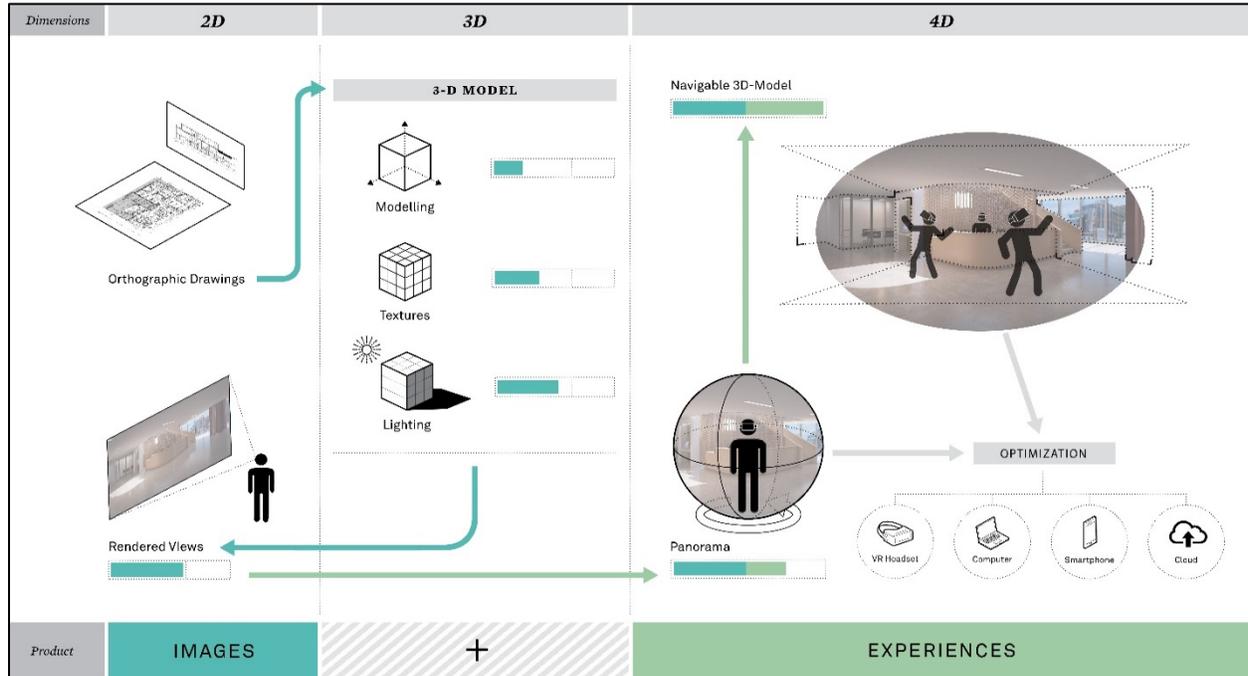


WebVR: choose 'Sketch/Massing/Final Lobby'

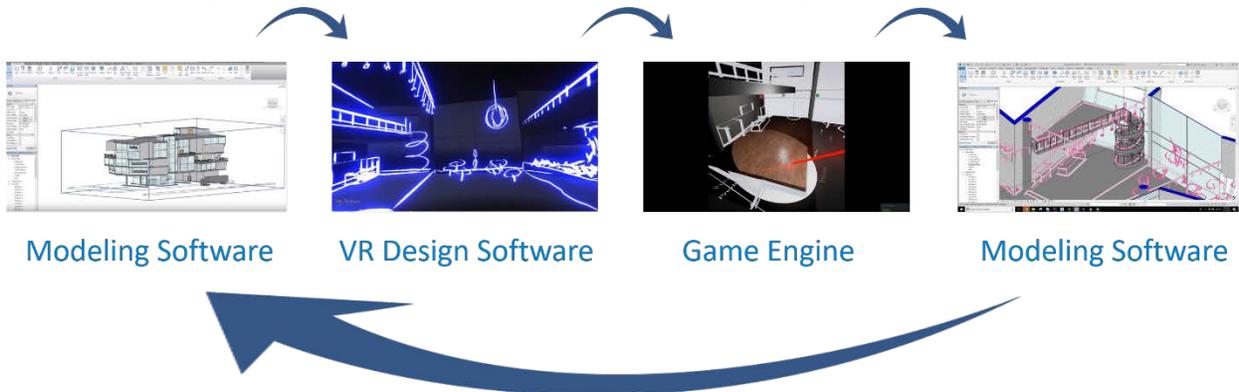
Design Viz

The most common use of VR for design: showing off a fully rendered experience. Software like [3ds Max Interactive](#) and Unreal Engine's [Datasmith plugin](#) reduce the friction of this workflow.

WebVR: choose 'Some Lessons: Pool'



An ideal design workflow incorporating VR sketching:



Practicing what I Preach

Here's a project born, bred, and finished entirely from within VR.

1. Drew a sketch in VR
2. Used the sketch as an underlay to build out the 3D geometry
3. Used the [Unreal VR Editor](#) to make material and lighting adjustments
4. Final experience ready for Daydream, Vive, and Rift

WebVR: choose 'Option Toggling: Living Room' or 'Movement in VR: Hallway'



How long until those with enough money (or bitcoin) are going to start hiring designers to create beautiful virtual spaces?

And without the limitations of gravity...



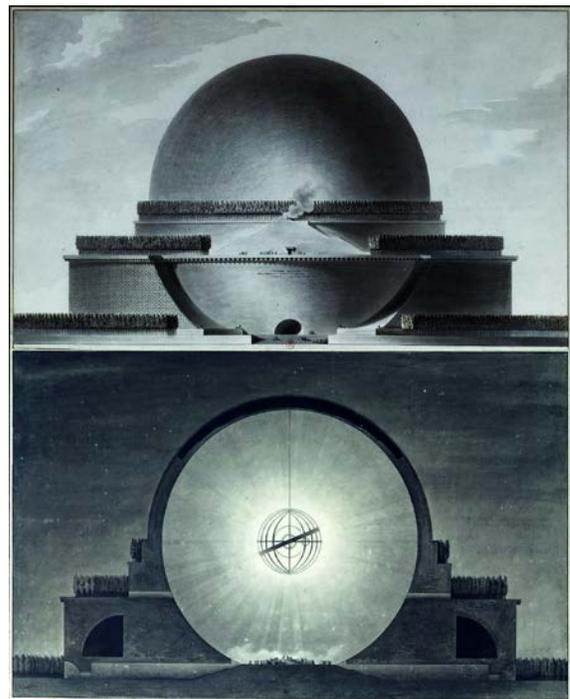
Ready Player One

Or the need for roofs...



Boullée 1728

Oculus Home



"Cenotaph for Newton,"

Anything is possible.

VR for Design In Summary:

What are the pitfalls?

1. Showing too much
2. Bringing attention to the wrong elements
3. Overwhelming the senses
4. Devoting too many resources
5. Motion sickness

What are the benefits?

1. Work through your ideas at scale
2. Communicate more clearly
3. Faster, more confident choices
4. Collaborate in realtime across the world
5. Give people an experience they'll remember
6. Stand out from the competition

And that's why, just like with any new technology, it's a good idea to develop your first VR project with an expert.

Now It's Your Turn...

Ready for the VR Sketchbook Challenge?

Let's Make Something New...

1. Open a VR drawing application.
2. (Optional) Import context or reference material.
3. Communicate a design in 30 lines or less.
4. Upload the result to sketchfab.com or vr.google.com/sketches
5. Share the result on Twitter with the hashtag #vrSketchChallenge

Ready for the VR Tracepaper Challenge?

Let's Revise Something...

1. Open a VR drawing application.
2. Import a design built in Revit, 3ds Max, Inventor (or any Autodesk software)
3. Communicate a design revision in 15 lines or less.
4. Upload the result to sketchfab.com or vr.google.com/sketches
5. Share the result on Twitter with the hashtag #vrReviseChallenge

Appendices:

WebVR Experimental Demo: <http://agilelens.altervista.org>

WebVR Stable Demo: <https://tinyurl.com/alau17>

Full Powerpoint Presentation: <https://tinyurl.com/aual17pp>

Downloadable Demos and Videos: www.agilelens.com/demos

Article about designing with VR: <https://tinyurl.com/IBMvrarch>

V-ray 360 Tutorial for Vizor.io: <https://tinyurl.com/vizoral1>

Youtube: www.youtube.com/ibrews

Twitter: www.twitter.com/ibrews

Email: alex@agilelens.com

Autodesk VR Software*

AGILE LENS
IMMERSIVE DESIGN

	Price	Learning Curve	Graphic Quality	Navigable Result	Multuser	Import Types	Export Types	Description
Revit Live	\$30/month	Low	Low	X		Revit	Revit Live Viewer	Simple export from Revit to VR experience.
Stingray	\$30/month	High	High	X	X	FBX, Revit Live	Standalone .exe	Fully programmable 3D game engine with nice real-time rendering.
3ds Max Interactive[^]	Free with 3ds Max Subscription (\$185/month)	Medium	High	X	X	FBX, Revit Live, 3ds Max	Standalone .exe	Based on Stingray, tuned for ArchViz and VR workflows
Forge	\$500/month	High	High	X	X	SVF	Cloud-based app	Development platform for web apps. Includes WebGL-based Viewer.
A360 Rendering	Cloud credits or included with Revit subscription	Low	High			Revit	Panoramic Image	Simple render and share platform for panoramas.

*Note: nearly all Autodesk software has functionality for direct output to create a panorama or 3D model viewable in VR through various plugins and render engines.

[^]Note: right now, 3ds Max Interactive and Stingray are identical, but moving forward 3ds Max Interactive will likely be branching to specifically target architects and designers.

VR Design Software

AGILE LENS
IMMERSIVE DESIGN

	Price	Drawing	Sculpting	Multuser	3D Import Types	3D Export Types	Special Features
TiltBrush	\$19.99	X			OBJ, Blocks	FBX, JSON, Poly, Unity3D	Intuitive. Many brush styles. Guides.
Blocks	Free		X		None	OBJ, Poly	Intuitive. Clean low-poly models. Great for massing
Quill	\$29.99	X			None	FBX, ABC	Feels the most like drawing and painting. Layers.
Gravity Sketch	\$24.99 - basic \$29.99/month - pro \$99.99/month - studio	X	X		OBJ	FBX, OBJ, Sketchfab	Clean curved surface modeling. Precision.
Medium	\$29.99		X	X	OBJ, FBX	OBJ	Intuitive. LOD control. Good painting.
Immerse Creator	\$19.99		X	X	None	None	High quality graphics. Snapping. Library of architectural objects.
MasterpieceVR	\$29.99	X	X	X	OBJ, FBX, STL	OBJ, FBX, STL	Collaborative. Balanced drawing sculpting. Project onto surface.
MakeVR	\$39.99		X		STL	STL, OBJ	Precise snapping. Boolean tools. Sweep.
AnimVR	Closed Beta (release early 2018)	X			OBJ, FBX, BLEND,	ABC, Sketchfab, Unity3D	Animation. Layers.
Unreal Engine VR Editor	Free		X		FBX, OBJ, Datasmith	FBX, Standalone application	VR design tools inside a game engine. High quality graphics, mesh editing, physics, materials.