

If the first thing that comes to mind when you think of virtual reality is a room full of teenagers wearing clunky helmets playing video games, you're not alone. But VR actually has a broad range of applications including engineering, military and space training, entertainment, marketing and even fine art. Art works and installations have begun to appear in galleries and

HOW VIRTUAL IS REDEFINING TRADITIONAL ART MAKING REALITY

BY JENNIFER VIRŠKUS

exhibitions in both virtual and physical forms: In February, Sotheby's offered visitors a chance to step inside a virtual version of Salvador Dalí's *Moment de Transition*, and in March, the Whitney Biennial in New York featured a VR "experience" installation by Jordan Wolfson. At the London Academy of Arts, works made in VR and printed using a 3D printer were exhibited as part of the exhibition *Virtually Real*.

¹ *Chalice*, by Edward Eyth. VR sculpture made in Oculus Medium. Copyright © Edward Eyth. Used by permission of the artist.



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As a computer technology, virtual reality has existed in various forms since the 1950s; artists David Em and Jeffrey Shaw were among the earliest adopters. In 1995, Em was making digital paintings with SuperPaint at the Xerox Palo Alto Research Center and then spent seven years as the artist in residence at NASA's famed Jet Propulsion Laboratory.

Shaw is a conceptual and performance artist known for his pioneering use of digital media. He explored the potential of VR in fine art through interactive works like *Legible City* (1989), which allows a viewer to ride a stationary bicycle through a 3D-simulated representation of a city.

These early works were made using digital tools available only to a select few. The advent of consumer-level headsets like the Oculus Rift, designed by California teenager Palmer Luckey in 2010, are making VR widely accessible, not only to professionals but also



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to the general public, and have spawned a slew of new programs, including several designed specifically with art making in mind.

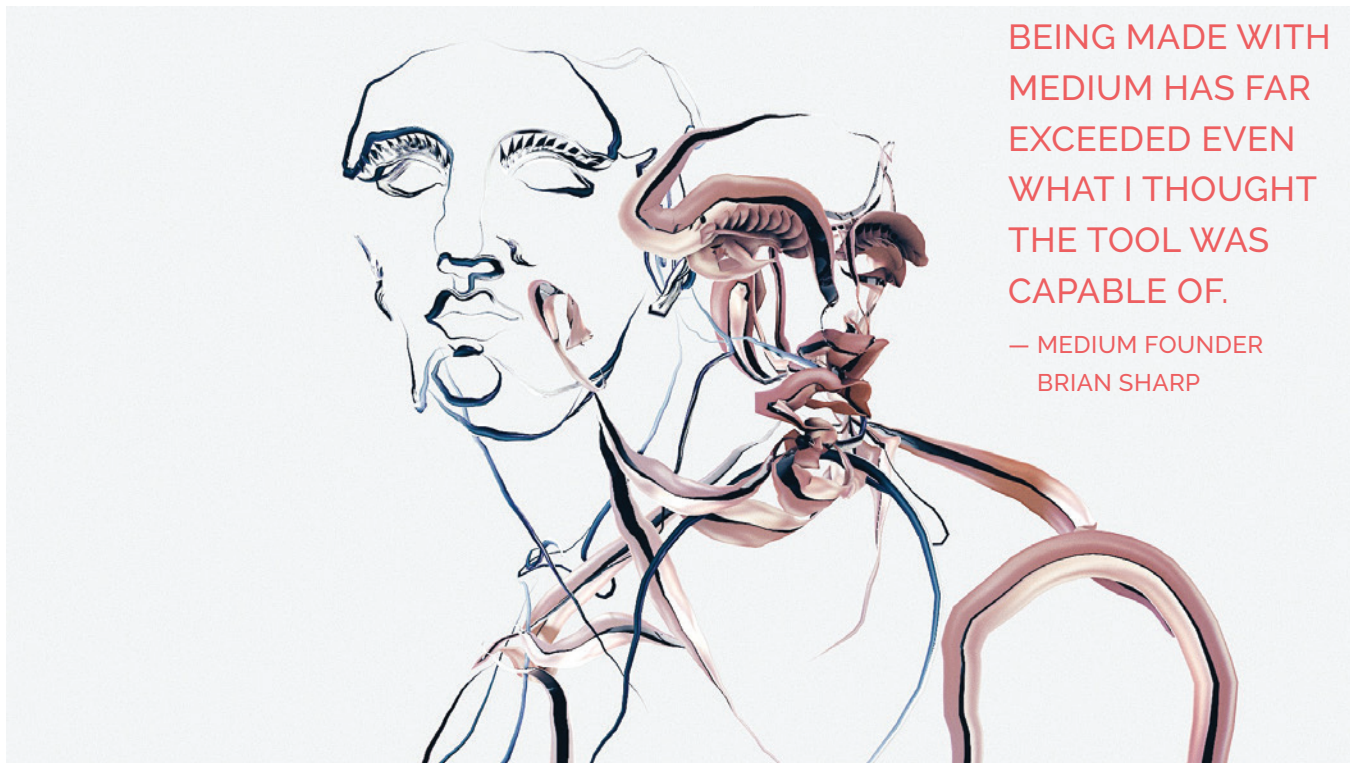
A NEW ART MEDIUM

The most notable art making programs currently available are Oculus Medium and Google Tilt Brush. Medium is a sculpting program designed with professional digital artists in mind while Google Tilt Brush is a painting program which allows you to "paint" flat or three-dimensional images in mid-air. Co-founder Drew Skillman says the program is designed for casual doodlers, professional artists and anyone curious to try their hand making art in VR.

Gravity Sketch, one of the latest programs to be released, is a CAD-like modeling program that allows multiple users to collaborate on a single piece. However, if you ask the developers behind these

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programs, they'll say they have been blown away by the work that all types of artists have created with these new tools.

"The caliber and quality of the work that's being made with Medium has far exceeded even what I thought the tool was capable of," said founder Brian Sharp.

Sharp came up with the idea for a virtual reality sculpting program in mid-2013. An engineer by training, he spent the first part of his career in video game development. "When I put on a VR headset for the first time, I had an immediate epiphany. There are a whole bunch of challenges of working in VR, there are walls like in the real world, but I thought if you could just put on the headset and there was a big block of clay, and you could sculpt it, that would work perfectly," he recalled.

To use Medium you need an Oculus Rift headset and Touch hand controllers and a powerful VR-



ready laptop or PC. (Apple recently announced that the next generation iMac and High Sierra operation system will accommodate VR operations). Gravity Sketch and Tilt Brush are available for both the Oculus Rift and HTC Vive headsets.

First-time VR users are recommended to sit down while using the program, as it can be somewhat disorienting when you put on the headset. Once you've got the headset on and Medium loaded, you'll see a workspace that resembles an empty studio and two translucent hands. Using the buttons on the controllers placed intuitively beneath your thumb and pointer finger, you can quickly squeeze out a glob

of virtual clay and navigate between tool panels to smooth, chisel and paint your figure.

"As soon as I got the Oculus setup and started sculpting, I got this smile on my face because it's so much like traditional sculpting. You take your hand controller and squeeze out a piece of clay, shave some off, add some more," said artist Edward Eyth (eeyth.com).

Eyth enjoyed a diverse career in the entertainment industry before returning to fine art as a figurative sculptor in 2004. "I started to realize that there are benefits to virtual sculpting that exceed traditional sculpting. I don't have to set up an armature, I don't have to warm up the clay, I don't have to do all the real-world things you have to do to make a sculpture. In VR, I can sculpt anything, look at it from any angle, stick my head inside the piece and look at it from the inside. I can enlarge it and then reduce it back down. That's the beauty."

THE LEARNING CURVE

The under-the-hood programming that powers Medium is similar to that of Photoshop and many of the tools in Medium are inspired by those in Photoshop — for example, smudge, smooth and blur. There is a learning curve to using VR art making programs, but most artists who've tried them say they have been pleasantly surprised at how intuitive they are.

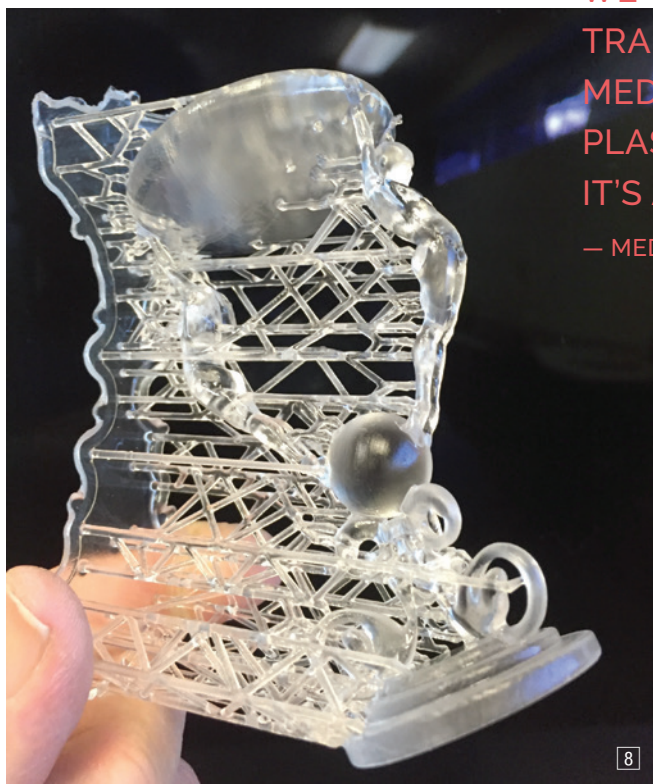
Razmig Mavlian (artstation.com/artist/razmigmavlian) is a concept artist on the Medium team, though he had never tried VR before joining Oculus. Now he says he's completely addicted to it. "It's not just something I'm working on. It's something I actually enjoy using, making whatever comes to mind. It's a virtual tool where you can use your imagination to come up with anything you want. I'll make a sketch in my sketchbook, then open up Medium and make it in 3D."

I recently scored a chance to put on an Oculus Rift headset to try Medium. My first challenge was getting my hands wrapped around the controllers in the right way. I have small hands, but once you discover where the buttons are and which finger to use with which one, they're easy to reach. My left pointer finger shot out a glob of clay from a virtual clay gun, a tool wheel on my right hand allowed me to easily swap between tools. A few more clicks and I'd discovered the shapes panel to shoot out clay in ready-made shapes I could refine into anything I wanted.

After 10 minutes, I hadn't made anything worth saving, but I was starting to feel comfortable in the VR environment. The learning curve didn't feel all

[6] [7] *Kanimon*, 2017, by Razmig Mavlian. VR sculpture made in Oculus Medium. Copyright © 2017 Razmig Mavlian. Used by permission of the artist.

[8] *Chalice*, by Edward Eyth. VR sculpture made in Oculus Medium. Copyright © Edward Eyth. Used by permission of the artist.



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that different than learning to work with the tactile properties and tools available for real clay. Indeed, it was more intuitive than drawing in some of the Adobe design programs I’ve used.

There are currently three types of material you can work with in Medium including the default clay, metal and emissive, a glowing material, and you can change between them on the fly. However, in VR these three materials all behave the same way unlike in the real world where sculpting with metal would be vastly different than sculpting with clay.

One drawback to working in VR is that while you use “hands” to spray paint or squeeze clay, you can’t actually feel the material you’re working with.

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“When you’re swirling around in space, there’s no haptic feedback. You can’t touch or feel it,” said Steve Lord. “Once VR gets to that point, I think it’s going to really blow up.” He has been using Medium for about a year as a conceptual tool while he hones his skills with the program but has been working for several years with 3D modeling and printing with ZBrush, until now the industry standard tool for digital sculpting.

The biggest difference between working with ZBrush on a desktop monitor and working with Medium is the immersive nature of VR. In ZBrush, you’re sculpting on four different perspective views at once — it’s completely abstract. In the Medium VR environment, it’s like sitting in your studio. You can lean your head

to the left or right to look at your piece from the side, stretch it, scale it or move it around.

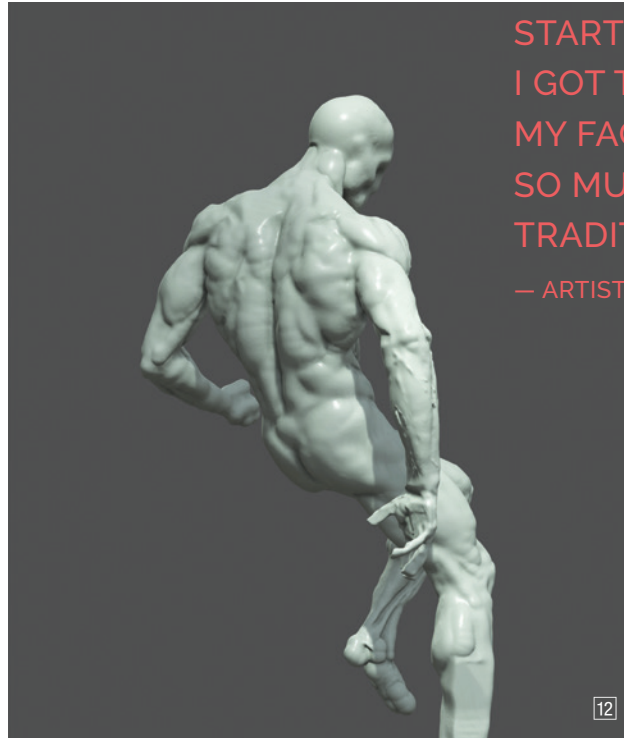
“I have ZBrush on my computer. I open it up once in a while, and I always feel like I’m sitting in the cockpit of a 747,” Eyth said. “I’m an old school guy. I’ve been sculpting for a number of years. I didn’t think I’d be finding Medium as appealing as it is. The more I use it, the more capable I become.”

Skillman says VR takes a significant step toward making computers function more like humans expect them to, and that will impact every aspect of how people interact with machines to make things, including fine art. “Functionally, it means artists will create their work faster, the process will be more intuitive, and the art itself will be unlike anything we’ve seen before.”

TRANSFORMING THE WORK

Sougwen Chung (sougwen.com) is a Chinese-Canadian artist now residing in New York City. Her work, spanning installation, sculpture, drawing and performance, explores the mark-made-by-hand and the mark-made-by-machine as an approach to understanding the interaction between humans and computers. Currently, she is the artist in residence at Bell Labs, working to help invent the processes and techniques to translate high-fidelity work from the virtual space back into the physical

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world. She primarily works with Tilt Brush and has also experimented with Medium and Quill.

When you “paint” in VR, if you look at it on a flat screen, it looks like a painting. If you print it with a 3D printer, it looks like a sculpture. When Sougwen paints in Tilt Brush, the work is almost musical in nature, stretching and flowing in space, a virtual Fantasia of colors and shapes.

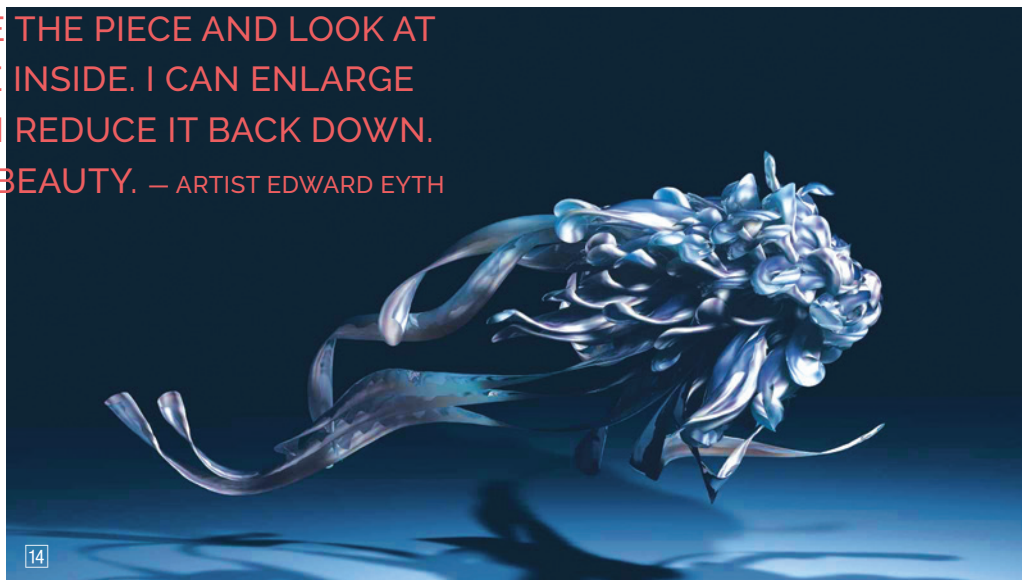
“Working in VR means exploring the sensory mixes of the future. Where one medium begins and ends is uprooted by the spatial fluidity of virtual reality. What is drawing is also sculpture is also music. The same spatial fluidity allows for a uniquely expressive, gestural translation from the imagination into a canvas of your own making,” she said.

Sougwen lists among her most successful pieces,



11 12 VR sculpture made in Oculus Medium, by Steve Lord. Copyright © 2017 Steve Lord. Used by permission of the artist. 13 *High Adventurer*, 2017, by Razmig Mavlian. VR sculpture made in Oculus Medium. Copyright © Razmig Mavlian. Used by permission of the artist.

“IN VR, I CAN SCULPT ANYTHING, LOOK AT IT FROM ANY ANGLE, STICK MY HEAD INSIDE THE PIECE AND LOOK AT IT FROM THE INSIDE. I CAN ENLARGE IT AND THEN REDUCE IT BACK DOWN. THAT'S THE BEAUTY. — ARTIST EDWARD EYTH



Imaginary Blueprints, which was on exhibition at The Drawing Center in New York in 2016. The piece is a reinterpretation of the drawings of Polytopes by Iannis Xenakis. The linework is drawn spatially within a VR environment with the intent to fuse the aesthetics of Xenakis' hyperbolic paraboloids with her own organic gestural linework. The goal of the piece was to explore the potential of virtual reality as a creative medium fusing drawing and sculptural sensibilities to create new

types of spatial experiences.

"Artists, especially fine artists, are masters at bringing their creative vision to life in spite (or, arguably because) of the challenges in their chosen medium. VR painting poses interesting new challenges that most people haven't encountered before — that's an enticing draw to all artists," Skillman said.

Eyth is primarily using Medium to conceptualize large-

6 VR Art Making Programs To Try

Oculus Medium:

A sculpting program for digital and traditional art, primarily used for modeling but some artists use it to translate work to the physical world with a 3D printer.

Tilt Brush by Google:

Allows you to paint in a 3D space. Work can be experienced in VR or used as a modeling tool for translating work into the physical world with a 3D printer. Available for both HTC Vive and Oculus Rift.

Quill by Story Studio:

Designed for Oculus Rift + Touch, Quill is a VR illustration and filmmaking tool built to be used either as a conceptual aid or for creating final works. Artists can work in several formats including watercolors, pencil or oil paints.

Gravity Sketch:

A CAD-like 3D design program for VR modeling. Available for Oculus and Vive, it also allows multiple team members to work on a project. Works can be exported to Rhino or to a 3D printer.

Mozilla A-Painter:

A web-based interpretation of Google Tilt Brush to allow artists to paint in VR across online platforms. Requires a WebVR-enabled browser and a HTC Vive headset.

LAB4242 PaintLab:

A basic but free VR painting and sculpting tool. Requires the HTC Vive headset and motion controllers.

scale pieces, though he has also brought a few small figurative pieces into the real world via the 3D printing service Shapeways.

"From a fine arts standpoint, it's great to go in there and work up a composition, compose a figure, put another figure next to it. It's all so efficient. For commercial work, when you're presenting a 3D piece, you can send the client a little clip or ideally put the headset on the client."

EVOLVING THE TOOLS

The Medium team is constantly innovating and refining the program, though Sharp said the program they shipped is surprisingly similar to his initial vision.

"When we shipped, people would ask us what's next; we would say we're waiting to see what the community does with it." They've watched artists like Lord, Eyth, and Mavlian, as well as Geo Nakpil and Goro Fujita discover how to use what they've built.

Routinely in Medium's monthly Artist Spotlight live stream events on Facebook, Sharp says the artists create things with his tool in ways he didn't even realize were possible.

"One of my favorite things about making art tools is this collaboration between engineers and artists. Artists don't necessarily know what's possible, but engineers don't necessarily know what's beneficial," Sharp said.

While Sharp won't list precisely the future innovations

and refinements to be expected from Medium, the artists I talked to all have a wish list. Eyth would like to be able to take a 360° photograph and import it into a layer in Medium. That way, he could present large-scale installation concepts against the proposed backdrop.

Lord imagines an augmented reality version of Medium that he could use anywhere. "I can imagine waiting for a train and working on a sculpture on the platform, wearing glasses where you can see the real world, your whole world blending the virtual and the real."

The Medium team fully expects VR to become the default for digital sculpting in the coming years. In fine art, just like analogue vs. digital in photography, there is likely to be a long debate about whether VR is a tool or a shortcut. Sharp, however, doesn't think of it as an either/or: "We've always said in terms of traditional mediums, it's another medium. I don't think it replaces plasticine or wood or marble, I think it's a new medium." **PA**

Jennifer Virškus is a writer and photographer based in San Francisco. Prior to earning her MFA in Writing at California College of the Arts, she was the art director at Aspen Magazine in Colorado and photo editor at Cosmopolitan, FHM and other magazines in Vilnius, Lithuania. She writes articles on a wide variety of topics for several online publications and consults with small businesses on how to develop and manage a successful content marketing strategy.

What You Need to Get Started in VR:



Hand controllers, for example, the Oculus Touch, now sold as a bundle with the Rift headset.



VR-ready PC or laptop, for example, this 14" Razer Blade. (Apple recently announced the new iMacs and High Sierra operation system due out this fall will support VR graphics.)



VR headset, for example, the Oculus Rift or HTC Vive.

