Art, Nature, and the Sublime in Virtual Reality

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This paper addresses philosophical questions that are relevant to virtual reality (VR) developers, designers, and artists. It argues that some objects in VR really exist, and some of these virtual objects that exist are really what they appear to be. Digital art, like digital photography, 3D models, and interactive art installations in VR environments, are real art. Unlike art, nature in VR cannot be real nature, and experiences of nature in VR are illusory. However, VR nature can be real art, and VR art can elicit experiences of the sublime. This paper also offers suggestions of how to design sublime experiences in VR.

1. Introduction

When you look at art in virtual reality (VR), are you looking at genuine art or at a reproduction? When you stand on a VR beach watching the sunset, are you experiencing the beauty of nature? Are these even real experiences or just illusions? Answering these questions is important not only to philosophers but to VR developers and artists interested in creating authentic experiences in VR. This paper will draw on research from analytic philosophy, specifically in metaphysics and aesthetics, as well as research in human-computer interaction and game design to explore the questions of whether, and under what circumstances, aesthetic experiences in VR can be real. I will first address the underlying metaphysical question of whether virtual objects and events are real or illusory, concluding that they can be real and that art objects provide prime examples of real virtual things. Then I will contrast two types of aesthetic experience: first, the experience of looking at art in VR, and second, the experience of being in nature. I will argue that art can be real art in VR but nature cannot be real nature. Finally, I will examine the concept of the sublime and argue that, although art typically cannot be sublime, VR art has certain similarities to natural phenomena that make experiences of the sublime possible in VR.

2. What is Virtual Reality?

For this paper, I will use David Chalmers's definition of VR. Under this definition, VR is defined by three characteristics: It is immersive, interactive, and computer-generated. 'Immersive' means that the virtual environment "generates perceptual experience of the environment from a perspective within it, giving the user the sense of 'presence': that is, the sense of really being present at that perspective." 'Interactive' means the user's actions can affect the virtual world. And 'computer-generated' means the environment is "grounded in a computational process," (Chalmers, 2017). This definition is broad enough to encompass VR technology in its current state, including experiences available on consumer VR headsets like the Oculus Quest, as well as more speculative versions of VR in which VR becomes indistinguishable from the physical world.

3. Do Virtual Objects Exist?

To figure out whether art and nature are real in VR, we must first establish that things in VR exist, because if something does not exist, it cannot be art or nature. Views on the metaphysics of VR can be divided into two broad categories, realism and irrealism. Realist views hold that VR objects exist and events that take

place in VR actually happen, while irrealist views hold that VR objects do not exist and events in VR do not really happen. Probably the most widely held irrealist view is fictionalism, which holds that VR objects and events are not real because they are fictional. The following sections will discuss David Chalmers's account of virtual realism and two counter-arguments to Chalmers's account from the perspective of virtual fictionalism.

3.1. Chalmers's Virtual Realism

In *The Virtual and the Real*, David Chalmers presents his realist account of VR. Loosely inspired by Heim (1998), the account starts by making the following claims:

1. Virtual objects really exist.

2. Events in VR really take place.

3. Experiences in VR are non-illusory.

4. Virtual experiences are as valuable as non-virtual experiences (Chalmers 2017).

To form his account, Chalmers builds on his previous paper *The Matrix as Metaphysics*, in which he argues that objects in a perfect, permanent VR (a virtual world that is indistinguishable from the physical world and persists over time) would be non-illusory, i.e., the things we call tables are actually tables; it just turns out that tables are not physical objects but virtual ones (Chalmers 2003). In his latest account, Chalmers expands this view to include imperfect and temporary forms of VR, including the types of VR experiences and games that are common today (Chalmers 2017).

Chalmers then goes on to further categorize virtual objects by distinguishing between things in VR that are what they appear to be and things in VR that are not what they appear to be. For example, a calculator in VR could be a real calculator, provided that it actually performs calculations. However, an object that appears to be a kitten in VR is not a real kitten, although it is a real virtual object (Chalmers 2017).

3.2. Counter-arguments from Virtual Fictionalists

Several counterarguments to Chalmers's realist view have been made by virtual fictionalists. Virtual fictionalists hold the view that virtual worlds are fictional worlds that do not really exist. Under fictionalism, virtual environments, like the continent of Skyrim in *Skyrim* VR (Bethesda Game Studios, 2018), are analogous to fictional environments, like Middle-earth in The *Lord of the Rings* novels. In both cases, according to fictionalists, the environment can be described, pictured, and imagined, but it does not actually exist.

Juul

In *Virtual Reality: Fictional all the Way Down (and that's OK)*, games researcher Jesper Juul argues that virtual objects cannot be real because they cannot fully replicate every aspect of the corresponding physical object in sufficient detail. For example, Juul addresses Chalmers's example of a VR calculator, arguing that to be a full-blown virtual counterpart of a calculator, "a virtual calculator would not only functionally be useable for everything a non-virtual calculator can be used for; in complexity it would not just simulate calculation, but also the electric circuits of a non-virtual calculator to a subatomic level" (Juul 2019). Essentially, Juul's argument is that because a virtual calculator cannot fully replicate the physical characteristics of a desktop calculator, it cannot be real. And by the same reasoning, no VR objects can be real because they are necessarily not identical to physical objects.

Response to Juul

The biggest problem with Juul's argument is its assumption that something must be identical to a specific, pre-existing physical object to exist. Juul is correct that VR objects must be limited or simplified in some way relative to their real-world counterparts. However, simplified things can still exist. For example, a stuffed animal shaped like a dog might be simplified and limited relative to a live dog, but it still exists. It is also possible for a simplified example of a thing to still be an instance of that thing. For example, six-sided dice are simplified relative to twenty-sided dice, but they are still dice. Even among desktop calculators, different brands and models have different circuitry. In fact, no two calculators are identical down to a subatomic level, so Juul's assumption that, to be a calculator, a thing must be identical to a specific desktop calculator, would rule out almost all of the things we usually consider to be calculators.

Moreover, Juul's requirement that, to be real, VR objects must accurately replicate physical objects seems to assume that only physical objects exist, which is clearly not true. From average rainfall to the number four to the Peloponnesian War, the world is full of things that exist without being physical objects. Most people would not argue that the calculator on their computer is a fictional calculator just because you cannot use it as a paper weight. Similarly, no one would argue that a digital clock is not a real clock just because you cannot rotate its hands like an analog clock, or that a digital photograph is not a real photograph just because you cannot rip it into pieces like a paper photo.

McDonnell and Wildman

In *Virtual Reality: Digital or Fictional?* Neil McDonnell and Nathan Wildman argue that VR worlds must be fictional because they have no causal power, and things cannot exist without causal power (Salmon 1998; Reichenbach 1958). In McDonnell and Wildman's account, things in VR are similar to things in traditional animation; they appear to cause events but do not actually.

McDonnell and Wildman illustrate their argument using the example of the cartoon characters Tom and Jerry: "Jerry strikes Tom on the head, and a lump emerges on Tom's head. We naturally describe this as a case where the strike caused the lump. Of course, there is no genuine causal relation between the frames of the animation." (McDonnell & Wildman 2019). Tom and Jerry do not really exist, as they are merely fictional characters. The real cause of the events in the cartoon is the animator drawing images and displaying them in a certain order to convey a story. Similarly, in VR, "the genuine causal interactions are between the execution of bits of code that decide which frames to render, not between the rendered frames themselves. VR and traditional animation are on a par in this respect," (McDonnall & Wildman 2019).

Response to McDonnell and Wildman

McDonnell and Wildman's argument is more convincing than Juul's, but their analogy between animation and VR applies best to objects, such as animals, that would be difficult or impossible to replicate digitally. In the example of Tom and Jerry, they are clearly not a real cat and mouse, and they are not actually moving or hitting each other; the animation merely creates a visual illusion that makes it appear as if they are physically causing things to happen. However, this paper is mainly concerned with aesthetic experiences, and there seems to be a relevant metaphysical difference between an animated mouse and an animated artwork.

Of course, it is possible for an artwork to be fictional. For example, the titular picture of Dorian Gray is not a real painting but a fictional one; although the novel that describes the painting is real art, the painting itself is not. On the other hand, some artworks depicted in fiction are real artworks. For example, the movie *Roman Holiday* was filmed in Rome, and the Trevi Fountain depicted in the movie is the actual Trevi Fountain, not a fictional fountain. Nevertheless, when people watch *Roman Holiday*, what they see is a video of the actual Trevi Fountain, not the fountain itself, but it seems possible that under some circumstances, the displayed artwork could really be the artwork itself, especially in the context of digital art. The next section will focus specifically on art and explore whether something that appears to be art in VR can really be art.

4. Virtual Art

Digital artwork exists in the world. Digital photography, video games, and streaming videos can all be art (Ang 1999; Melissinos 2012). If one digital artwork can contain another virtual artwork, it may be possible for a VR environment to contain genuine digital art. The following sections discuss digital art in VR, when it is genuine art, and when it is merely a reproduction.

4.1. Digital Art in VR

There are three ways in which digital art in VR can be real. First, a VR world can be a work of art itself. Second, traditional digital art can be displayed inside of a VR environment. Third, native VR artworks can be created specifically for display inside VR environments.

Perhaps the least metaphysically ambiguous way in which VR art is real is that a VR environment itself can be art. For example, *Eidolon360* is a VR film that places the user in the perspective of a resuscitation mannequin (Hood & Flint 2018). *Fool's Paradise* is a VR garden full of giant masks and musical compositions based on William Blake's *Proverbs of Hell* (Hertz & Dembski 2018). *Beyond the Canvas - Bliss* takes traditional oil paintings and transforms them into 3D interactive experiences in VR. Even some VR games, like Land's End (Us Two Games 2015), are stand-alone works of interactive art. All of the above examples are clearly works of art; they are analogous to digital videos or photographs displayed on a computer monitor or to video games. For the same reasons it is generally accepted that those digital artifacts can be real art, VR environments can also be real art.

More interesting are the ways in which artworks can exist when displayed inside of VR environments. This is possible when, for example, a VR art gallery displays digital photography on its walls or a 3D model is displayed in a VR sculpture garden, along the lines of Matias Brunacci's The Dome (Brunacci 2017), a virtual kinetic sculpture displayed in VRChat. In these examples, the gallery itself is not a real building, and it may or may not be a real gallery (determining the necessary and sufficient conditions of a gallery is beyond the scope of this paper), and the sculpture garden may not be a real garden. However, the digital photographs and 3D models are clearly real art.

Importantly, the above examples of art existing inside a VR environment are digital works of art. That is because all of the objects that exist in VR are virtual objects, so in order to be genuine art in VR, an artwork must be digital in its original form. Otherwise, it would be merely a virtual reproduction of a non-virtual artwork.

4.2. Digital Art Reproductions in VR

Virtual copies of physical artworks are not identical to the original artworks, and in some cases are not art at all. If we are all living in a simulation and always have been, then it seems the thing we have been calling the Sistine Chapel is the real Sistine Chapel; it just turns out to be a virtual rather than physical object (Chalmers 2003). However, if the regular world we are familiar with is not a simulation and the Sistine Chapel is, as it appears, a physical building in Rome, then a VR version of the Sistine Chapel, like *Il Divino: Michelangelo's Sistine Ceiling in VR* (Evans 2019), is clearly not the real Sistine Chapel. That is true even if the VR replica is a 3D scan of the Sistine Chapel, which, displayed in VR, is visually indistinguishable from the real thing. No VR reproduction of a physical artwork can be identical to the real artwork because it lacks the quality of being a physical object.

5. Virtual nature

A type of aesthetic experience that has recently received renewed attention in environmental ethics is experiencing the beauty of nature. However, in contrast to looking at VR art, the experience of being in VR nature is never genuine because real nature cannot exist in VR.

There are VR environments that attempt to accurately reproduce specific, pre-existing natural environments, like the Grand Canyon (Immersive Enter-

tainment 2017). There are also VR experiences like *Nature Treks* (Greener Games 2017), which simulate natural environments that look similar to environments that really exist, with trees, mountains, deer, etc. And there are VR environments that depict completely fictional environments, like *No Man's Sky* (Hello Games 2016), which simulates the geography, flora, and fauna of alien planets. These examples may seem closer to or farther from actual nature, but they are all reproductions rather than genuine nature. That is because nature, by definition, is not made by humans or computers, while VR environments, per Chalmers's definition given at the beginning of this paper, are necessarily computer-generated, and usually designed by humans.

Although the things in VR that appear to be natural are not really nature, it is important to note that they can still be real art. However, to be art, a VR representation of nature must go beyond simply reproducing a pre-existing physical environment by applying curation or interpretation to it.

6. The Sublime

Most of us have, at some point, experienced the sublime. For example, staring up at the sky on a cloudless night and contemplating our own insignificance compared to the vastness of the universe stretches the bounds of our limited imagination and fills us with feelings ranging from helplessness to awe. Unlike experiencing beauty, which is a purely pleasurable aesthetic experience, the sublime is an aesthetic experience that mixes pleasure and displeasure. More specifically, sublime experiences may make us feel a sense of awe, danger, powerlessness, smallness, or being overwhelmed, while ultimately being a positive experience.

While the sublime has been studied deeply by continental philosophers like Lyotard, it has been out of fashion in analytic philosophy for over a hundred years and has only recently begun to receive renewed attention. Historically, the most influential account of the sublime in both the continental and analytic philosophical traditions comes from Kant. In *The Power of Judgment*, Kant distinguishes between two versions of the sublime. The mathematically sublime is characterized by vastness or infinity beyond what the human imagination can grasp (Kant 2000). Conversely, the dynamically sublime is characterized by extreme power, danger, or unpredictability, eliciting feelings of fear but also demonstrating the human intellect's superiority over nature (Kant 2000).

More recently, the sublime has experienced renewed popularity in the field of environmental philosophy. In *The Sublime in Modern Philosophy*, Emily Brady argues that the 18th century concept of the sublime is still relevant in analytic philosophy because it describes aesthetic experiences that are still valuable and important, and she offers a modern account of the sublime which is largely inspired by Kant.

6.1. The Sublime in Nature

The clearest examples of the sublime are found in nature. Paradigm cases of the mathematically sublime include mountains and the sea (Kant 2000). Paradigm cases of the dynamically sublime include overhanging cliffs, thunderstorms, volcanoes, and hurricanes (Kant 2000). All of these examples are overwhelming in size or power when compared to humans.

6.2 .The Sublime in Art

The vastness, formlessness, and wildness that characterize the sublime in nature are difficult to reproduce in art, because art objects are designed artifacts that are constrained by their media, and for that reason, many have concluded that art either cannot be sublime or can only be sublime through association (Zuckert 2012). More specifically, Brady argues that art lacks all of the following five characteristics, making it unlikely that art can be sublime (Brady 2013):

1. Vast scale

2. Formlessness and unbounded character

3. Wild and disordered character

4. Evoking feelings of physical vulnerability

5. Revealing your own interconnectedness with nature and making you see yourself as part of a larger whole

Not all five characteristics are necessary requirements for a sublime experience, according to Brady. For instance, 1 is specific to the mathematically sublime while 3 is specific to the dynamically sublime. However, things that lack all five characteristics are unlikely to be sublime (Brady 2013).

6.3. The Sublime in Virtual Reality

More than other media, VR is capable of overcoming the limitations standing in the way of sublime art, and I will argue that VR experiences can exemplify all five of Brady's characteristics of the sublime. Computer-generated environments can be infinitely large. Procedurally generated worlds can feel unbounded, disordered, and wild. VR is good at producing feelings of vulnerability by, for example, placing virtual objects around the user and restricting the user's field of view or by presenting steep drop offs. And finally, VR can reveal important aspects of humans' interconnectedness to the wider world.

Games like *Minecraft* (Mojang 2011) and *No Man's Sky* (Hello Games 2016) are set in procedurally generated worlds, meaning the environments are built by algorithms rather than being designed by people. The algorithms generate new planets, terrain, biomes, etc. as the player moves through the world, so theoretically, the player could move through the game world forever without seeing the same location twice. The vastness of these virtual worlds mirrors the vastness of the actual universe.

Similarly, VR worlds can have the "formlessness" and "unbounded character" that is lacking in other art forms. Paintings, for example, are usually small rectangular objects made of canvas and contained within frames. The boundaries of the painting are clearly defined, and to experience the painting, a viewer must stand near it and look. Paintings do not surround or engulf the viewer or contain the view within themselves, but VR environments can. From the inside, a VR world can appear boundless and unconstrained by the physical equipment producing it.

VR is also good at producing feelings of vulnerability in its users. Because the virtual world is displayed 360 degrees around the user, the user cannot see the whole world at once, which creates opportunities for things to sneak up behind the user. Unlike darkness displayed on a flat screen, which does not obscure users' view of their surroundings, darkness in a VR world is actually dark for the user. For those reasons, horror games are particularly effective in VR. Additionally, it is possible, using unconventional haptic feedback systems, to make VR interfaces genuinely dangerous, although ethical considerations weigh heavily against doing so.

It might at first seem like any computer-generated environment must lack the wild and disordered character of the natural sublime, because virtual worlds

must either be designed by humans or created by algorithms, both of which tend to have more orderly and predictable results than natural phenomena. However, virtual worlds do not have to be orderly or predictable.

Finally, VR experiences may not be able to reveal much about humans' interconnectedness with nature, per Brady's fifth criteria, because real nature does not exist in VR. However, VR may be able to reveal other, equally important things about humans' interconnectedness with technology. The fact that computers can generate vast and unpredictable worlds, far beyond what we can hold in our imagination at one time, can evoke feelings of smallness and helplessness. At the same time, we can intellectually grasp the computational processes that are generating these vast worlds, and the realization that their enabling hardware and software was created by humans over many generations is simultaneously humbling and empowering. This realization amounts to an experience very much like the paradigm cases of the sublime discussed by Kant.

6.4. Design Suggestions

Artists wanting to create sublime VR experiences can start by incorporating random numbers into procedurally-generated worlds to get results that are unpredictable even to the artist. They may also want to disregard or subvert some widely-held design principles. For example, narratives in which the user is a hero whose actions determine the fate of the world are less likely to produce sublime experiences than narratives in which the user is a minor character with little power to affect the world. Similarly, clearly communicating rules and goals and nudging users towards those goals with rewards and feedback is less likely to produce sublime experiences than allowing users to wander aimlessly through an indifferent universe. In general, it will benefit artists of the sublime not to take a user-centered approach to designing VR experiences.

7. Conclusion

Some objects in VR really exist, and some are really what they appear to be. Digital art, like digital photography, 3D models, and interactive art installations in VR environments, are real art. Unlike art, nature in VR cannot be real nature, and experiences of nature in VR are fictional. However, VR nature can be real art, and VR art can elicit experiences of the sublime.

References

Ang, Tom.
The Art of Digital Photography. 1999. New York: Amphoto Books.

Bethesda Game Studios.
2018. Skyrim VR.

Brady, Emily.
The Sublime in Modern Philosophy: Aesthetics, Ethics, and Nature. 2013. New York: Cambridge University Press.

Brunacci, Matias.
The Dome. 2017.
https://www.matiasbrunacci.com/thedomevr.html.

Chalmers, David.
2017. "The Virtual and the Real". Disputatio 9 (46): 309-352.

Chalmers, David.
"The Matrix as Metaphysics". 2005. In Philosophers Explore the Matrix, ed. by C. Grau. Oxford University Press.

Evans, Christopher.
"Il divino: Michelangelo's Sistine ceiling in VR". 2019. ACM SIGGRAPH 2019: Virtual, Augmented, and Mixed Reality. Association for Computing Machinery, New York, NY, USA.

Greener Games.
Nature Treks. 2017.
https://naturetreksvr.com.

Hello Games.
No Man's Sky. 2016.
https://www.nomanssky.com.

Hertz, Paul and Stephen Dembski.
"Fools Paradise: Intermedia in VR". 2018. xCoAx 2018: Proceedings of the Sixth Conference on Computation, Communication, Aesthetics, and X. Porto: University of Porto.

Hood, Beverley and Tom Flint.
"Eidolon360 – A VR Experience". 2018. xCoAx 2018: Proceedings of the Eighth Conference on Computation, Communication, Aesthetics, and X. Porto: University of Porto.

Immersive Entertainment.
The Grand Canyon VR Experience. 2017.
https://store.steampowered.com/app/407710/The_Grand_Canyon_VR_Experience.

Juul, Jesper.
"Virtual Reality: Fictional all the Way Down (and that's OK)". 2019. Disputatio 11 (55):333-343.

Kant, Immanuel.
Critique of the Power of Judgment, ed. Paul Guyer, trans. Paul Guyer and Eric Matthews. 2000. Cambridge: Cambridge University Press.

Lyotard, Jean-François.
The Inhuman: Reflections on Time, trans. Geoffrey Bennington and Rachel Bowlby. 1991. Cambridge: Polity Press.

McDonnell, Neil and Nathan Wildman.
"Virtual Reality: Digital or Fictional?" 2019. Disputatio 11 (55):371-397.

Melissinos, Chris, Patrick O'Rourke, and Smithsonian American Art Museum.
The Art of Video Games: From Pac-Man to Mass Effect. 2012. New York: Welcome Books.

Mojang Studios.
Minecraft. 2011.
https://www.minecraft.net.

Mundry, Tonio.
"Beyond the Canvas/ Bliss". 2020. xCoAx, 2020: Proceedings of the Eighth Conference on Computation, Communication, Aesthetics, and X.

Reichenbach, Hans.
The Philosophy of Space & Time. 1958. New York: Dover Publications.

Salmon, Nathan.
"Nonexistence". 1998. Noûs 32, no. 3: 277-319.

Ustwo Games.
Land's End. 2015.
http://www.landsendgame.com.

Rachel E Zuckert.
"The Associative Sublime: Gerard, Kames, Alison and Stewart". 2012. In Timothy M. Costelloe, ed., The Sublime: From Antiquity to the Present. Cambridge: Cambridge University Press, 64–76.