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## Genealogies of Immersive Media and Virtual Reality (VR) as Practical Aesthetic Machines

### ABSTRACT

When virtual reality 'first' appeared on the scene in the 1990s, its philosophical, and even metaphysical, potentials were not lost on several authors whether they perceived them in largely dystopian terms (see Kroker 1993) or naively affirmative ones (see Rheingold 1991). Perhaps the author who most intimately connected virtual reality and philosophy was Michael Heim, whose work the *Metaphysics of Virtual Reality* (1993) situated technologies of the virtual as ontological machineries, enabling the practical design of modes of experience that philosophers had hitherto only been able to imagine; to paraphrase Marx, where philosophy had only been able to describe the world, virtual reality designers were making new worlds of ontogenetic experience available to their users. Of course, virtual reality is only the last of a long line of technologies of the virtual in the twentieth century, passing through all the technological innovations of cinema, stereoscopy, 3D and other immersive media whose deeper history dates back to panoramas, Viewmasters and other devices, and further to such philosophical machineries as Plato's cave.<sup>1</sup> More specifically, virtual reality emerges out of an intersection between audiovisual moving images and sounds and computing, that began as early as the 1960s, as so many varieties of what Gene Youngblood called 'Expanded Cinema' (1970). This chapter will explore these genealogies of virtual immersive technologies as modes of practical aesthetics, enabling concrete experiences of perceptual transformation and metamorphosis, a becoming other to oneself and one's habits of perceiving and being in the world. It will argue that rather than the transcendence often attributed to these experiences in the 1990s that immersive technologies of the virtual open up space of pure immanence and becoming which may exceed habitual lived bodies, but only by creating a new body without organs, a 'new flesh' of technologically remediated pure immanence. As such it will draw on Deleuzian concepts of the virtual, as well taking a media archaeological approach to the non-linear development of virtual and immersive technologies drawing on the work of Siegfried Zielinski and Jussi Parikka.

### **Exergue: The 'Magic' of Presence**

*Rift's advanced display technology combined with its precise, low-latency constellation tracking system enables the sensation of presence – the feeling as though you're actually there. The magic of presence changes everything. You've never experienced immersion like this. (Oculus Rift 2017: n.p.)*

*Presence is the magic of virtual reality (VR), the feeling that you're actually in the virtual world. Presence will cause the user to suspend disbelief and believe they are in the virtual environment, reacting to stimuli as if they were in the real world. It's the holy grail, the purpose of VR. (Rogers 2017: n.p.)*

### **Towards a Media Archaeological Approach to Virtual Reality**

Advertising and promotional hype like this, which is basically advertising for a commercially available Oculus Rift VR headset and related content, give the impression that Virtual Reality is a new, emergent 21<sup>st</sup> century phenomenon, facilitating never-before-experienced potentials for 'immersion', 'presence' and perceptual realism. Such claims to novelty should give anyone attuned to cultural histories of technology pause, especially if we want to adopt a media archaeological perspective attuned to both what is old in the new, as well as what is new in the old (see Parikka 2012: 10-14). Virtual reality, and the dreams of total presence it sustains, is especially prone to periodic bouts of historical amnesia, so much so that reading contemporary 'practical' accounts of VR it is as if it has no history. However, if one retains any memory, or does any research into, cybercultural discourse of the 1990s, one can find here both the same if not more prominence accorded to VR, and an even greater level of hype, in some instances, as well as paranoia in others. As with other audiovisual media technologies like 3D and stereoscopy, technological development is cyclical rather than progressive, with different technical assemblages returning when conditions, whether technical, economic, cultural or all of the above are right. As Parikka puts it:

Thinking cyclically has been one media-archaeological strategy for critiquing the hegemony of the new. [...] Zielinski's development of media archaeology as research into the deep time of the media – modes of hearing seeing and sensing in general – is another way of developing an alternative temporality that moves away from a

hegemonic linearity [that works] towards improvement and something better.

(Parikka 2012: 12)

Without following Zielinski into thousands of years of deep time, it is clear that VR devices and the more general field of immersive media have followed distinct cycles across the last century or more with high points in the 1960s and 1990s as well as in the present. Another key insight is that more than technologies, they are specific ways of organising the senses hence aesthetic machines. As such, they are part of the non-linear history of audiovision, a specific assemblage related to previous ones such as cinema and television, except that they have different affordances in terms of tactility, agency and the generation of a 360 degree environment that renders VR a distinct type of aesthetic machine. Furthermore, VR is not a distinct, isolated phenomena but part of a continuum of technical devices and assemblages including such dominant ones as cinema and television, as well as more specific arenas such as cinematic special effects, histories of simulation, and conjunctions between moving images and computing that go back at least to the 1960s.

### **VR and Genealogies of Audiovision**

Virtual Reality, as argued above, can usefully be situated as part of a broader history of audiovision in several interlocking ways. Siegfried Zielinski proposed the term 'audiovision' in his book *Audiovisions* (1999) as an alternative way of understanding both cinema and television as 'entr'actes in history', meaning as contingent and far from stable assemblages, enabled by practices of invention that have also led to other audiovisual arrangements that are 'no longer film, no longer television' (See Zielinski 1999: 219-272). While he acknowledges theories of the cinematic apparatus in his introduction to this work, it fundamentally goes against static ideas of any 'basic apparatus' as theorists like Baudry proposed (see Baudry 1985), and is much more in line with Casetti's appropriation of the concept of the assemblage (2015: 67-98), to account for the 'cinematic' as dispersed across a heterogeneous post-cinematic field. What all of this has to do with VR is that while going further than other post-cinematic assemblages in terms of levels of immersion and interactivity, even apparently dispensing with the need for a screen or interface, it nevertheless remains post-cinematic because still concerned with moving image and sound environments, even if augmented by increased tactile potentials via sensors. As such it is

part of what Zielinski characterised in the following terms, bearing in mind that this was originally formulated in the late 1980s before even first generation VR:

Advanced audiovision, as a complex construction kit of machines, storage devices, and programmes for the reproduction, simulation and blending of what can be seen and heard, where the trend is their capability of being connected together in a network but which [...] display a similar heterogeneity to that which was characteristic of a large part of the nineteenth century. (Zielinski 1999: 19)

This cyclical return to the nineteenth century exhibition of diverse attractions in the form of multiple devices for generating illusion of movement in space in time has not been lost on other authors, for example, in the volume *The Cinema of Attractions Reloaded* (Strauven ed. 2014) in which a range of authors demonstrate the ways in which the fascination with technological machineries of illusion rather than immersion in narrative, characterise the contemporary era of fantasy blockbusters, CGI, Imax presentations and the return of 3D cinemas.

The latter collection of post-cinematic phenomena, also brings up the importance of sound in VR and experiences of media immersion more generally; while initially considered to be primarily a visually defined experience, increasingly sound, as Frances Dyson argues (Dyson 2009), has proved essential in actually generating the sought after senses of immersion and presence. This has also proven to be the case in cinematic special effects development in which the development of sonic special effects was arguably more sophisticated and in advance of visual effects.

But there is another more specific reason to relate VR to genealogies of audiovision, namely that it emerges directly out of the intersection of computing and specifically computer interfaces and moving image technologies, a process that began in the 1960s but really accelerated in the 1990s. Initially these technologies had little in common, as cinematic moving images were generated by industrial, mechanical technologies for simulating illusions of real movement and thereby facilitating new forms of narrative, whereas computers were largely concerned with calculation, and its software was either algorithmic or related to technologies of writing. Hence the first technological coupling of the computer was with the typewriter, not with anything audiovisual. However, as computers started to become a more graphical medium in terms of both interfaces and at the level of now object oriented software, its artistic applications became increasingly

apparent leading to computer art, which soon took the form of moving images. This becoming visual of computing has been discussed in more detail by Casey Alt who argues that it was only with object oriented software that computers became a medium (see Alt 2011: 278-301). Similarly, innovative filmmakers wanted to go beyond the possibilities not only of the photographic images but even of analogue varieties of animation, and turned to computer animation as a way to achieve this. This intersection of cinema and computing played a key role in what would be named by Gene Youngblood as 'Expanded Cinema' (1970), which is really where virtual reality begins.

### **What is Virtual and What is Real in VR**

Many of the contrasting responses to Virtual Reality in the 1990s came down to different positions on how virtuality could be understood. In terms of a dictionary definition, the virtual is usually understood as not quite real, or having an 'as if' quality, in other words as a form of simulation or illusion. For relatively paranoid theorists like Baudrillard, Virilio and their followers such as Kroker, VR could be seen as the culmination of tendencies towards simulation and annulling of reality already enacted via earlier technologies like photography and cinema. In this sense, without their direct reference to virtual reality itself, the virtual is seen as an annihilation of the 'real world' if not proof that such a thing no longer exists, whether via simulation or substitution, the 'precession of simulacra' (Baudrillard 1994) or the 'aesthetics of disappearance' (Virilio 2009). On the other hand, other writers such as Howard Rheingold (1991) or Pierre Levy (1996) embraced the actual development of virtual technologies including virtual reality with undisguised enthusiasm. However, especially in the case of the latter, this was a very different concept of the virtual, more derived from Bergson and Deleuze than these more pessimistic accounts. For Deleuze, following Bergson, the virtual is not opposed to the real but is in fact what is really intensively real about reality, as the reservoir of past potential, actualisable in any given situation. Another term Deleuze uses is the 'Powers of the False' (See Deleuze, 1989, 126-155) which suggests a more affirmative take on simulation, which dates back to his earlier aim of reversing Platonism by affirming simulacra, (see Deleuze, 1990, 253-265). If in the 1990s, few writers were able to avoid the polarization of either radically affirming or rejecting virtual reality, at least they had the virtue of adopting a speculative, philosophical approach, nowhere more apparent than in the work of Michael Heim whose books *The Metaphysics of Virtual Reality*

(1993) and *Virtual Realism* (1998), tended to situate virtual reality as opening up new possibilities for metaphysical experience, continued in a recently initiated ten volume series *VR Metaphysics* (Heim 2017-). These distinctions and assumptions about virtuality, whether a text is explicitly philosophical or not, are fundamental to how virtual reality, and indeed cyberculture more generally, is understood. As Heim puts it:

The ultimate VR is a philosophical experience, probably an experience of the sublime or awesome. The sublime, as Kant defined it, the spine-tingling chill that comes from the realization of how small our finite perceptions are in the face of the infinity of possible, virtual worlds we may settle into and inhabit. The final point of a virtual world is to dissolve the constraints of the anchored world so that we can lift anchor. (Heim 1993: 137)

If this still sounds like a transcendent understanding of virtuality, Heim's philosophical reference points are multiple, encompassing in addition to Kant, Heidegger, Leibniz and going back as far as Duns Scotus, which are also key reference points for Deleuze's immanent concept of the virtual. A virtual world is neither equivalent to 'reality' or more precisely 'real reality' but nor is it imaginary. Instead, Heim claims it is relatively unanchored: 'A virtual world can only be virtual if we can contrast it with the real (anchored) world. Virtual worlds can then maintain [...] a multiplicity that is playful rather than maddening' (Heim 1993: 133). Even if Heim is still using the language of the imaginary that Deleuze explicitly rejects to some extent, it resonates with ideas of crystalline perception from Deleuze's cinema books and even more with the concept of the plain of immanence from Deleuze and Guattari: virtual reality in this sense would not be a substitute for reality nor its transcendence but a step into the immanent diagram of a world of experience; not an escape from reality or being but a form of ontogenesis in which one becomes other to oneself, has other sensory experiences, while experiencing a form of blended embodiment combining a here and an elsewhere, self and other, being and becoming. In order to flesh out this theoretical approach to virtuality and to VR as an aesthetic machinery, it is necessary to take a step back to the precursors of VR in so many varieties of what was once called expanded cinema.

## **Primal Scenes of VR: *Vertigo* (1959) and the Stargate Corridor in *2001: A Space Odyssey* (1968)**

Alfred Hitchcock certainly was one of the filmmakers open to innovations in visual arts, up to and including early computer animation. In the film *Spellbound* (1945) he invited Salvador Dali to create the sets for scenes that was less a dream sequence than the psychoanalytic recall of a dream; but while these Daliesque images were striking in their deliberate artifice, they were also somewhat corny and stagy, reminiscent of the artificial sets of German expressionist films of the 1920s. For some of his later films, Saul Bass had already been creating abstract animated sequences but for *Vertigo* he wanted a series of rotating abstract geometric figures that should be mathematically precise. They turned to the artist John Whitney, who had already been experimenting with these kinds of moving images, by adapting WWII military technologies for rotating anti-aircraft guns:

Whitney realized that the gun director could rotate endlessly, and in perfect synchronization with the swinging of a pendulum. He placed his animation cels on the platform that held the gun director, and above it suspended a pendulum from the ceiling which held a pen that was connected to a 24-foot high pressurized paint reservoir. The movement of the pendulum in relation to the rotation of the gun director generated the spiral drawings used in *Vertigo's* opening sequence. (Guo, 2018, 54).

The results, which can be seen both in the opening credits to *Vertigo* as well as in Whitney's own film *Catalog* (1961), literally a catalogue of the visual effects generated by this machine, already point to the generation of abstract virtual spaces with immersive and hypnotic qualities, as the realisation of the conjunction of computing and audiovisual media.

**[Insert fig. 1 here, caption: Abstract Immersive Images in *Catalog* (1961), John Whitney Sr.]**

Jordan Belson, working at the same time, also followed a similar trajectory and also explored the possibilities of expanded cinema involving computer animation and often with a cosmic, mandala related theme, as can be seen, for example, in his film *Allures* from 1961. While technologically less sophisticated than Whitney's contemporaneous work, it is aesthetically and philosophically more complex, described by Youngblood as 'a



“mathematically precise” film on the theme of *Cosmogogenesis* [emphasis in original], Teilhard de Chardin’s term to indicate that the universe is not a static phenomenon but a process of becoming, of attaining new levels of existence and organization’ (Youngblood 1970: 160).

The ultimate realisation of such aesthetic practices cinematically was in the famous ‘Stargate Corridor’ sequence of *2001* in which the special effects supervisor Doug Trumbull turned to such preceding experiments in order to create a new technique for producing special effects, the ‘Slit Scan technique’. This was developed by Whitney in order to generate continuous variation of abstract shapes, but then modified for the film by making it more three dimensional (see Youngblood 1970: 151-156). While this was all a purely analogue process, the effect of the final sequence was absolutely formative in terms of the look of future computer animation. It also had a huge impact on the imagination of cyberspace both in science fiction such as in the equally formative *Neuromancer* (Gibson 1984) and in the development of cyberspace itself as a multi-dimensional graphically generated space, functioning as an interactive virtual world.

All of these examples were central to Gene Youngblood’s concept of Expanded Cinema which, while having its roots in experimental animation, was already having a marked influence on Hollywood. In a sense, these experimental practices already crossed commercial and creative worlds in new ways; developing out of a fine art context, they nevertheless found application for use in title sequences, logos and advertising, a tension that would continue to mark technologies of virtuality up to contemporary VR. While John Whitney’s children would continue his work by becoming computer programmers, it was really George Lucas who fully brought digital computing technologies into the world of Hollywood filmmaking, and not just for title or dream sequences; these technologies would become essential for the *Star Wars* franchise, but also the development of digital effects through his Industrial Light and Magic Studio and its computer animation offshoot Pixar, which would lead ultimately, in the 21<sup>st</sup> century, to the production of virtual reality films.

### **Back to the Future, According to the 1990s**

There are several accounts such as by Hillis (1999) and Heim (1998) of the direct history of VR including such things as Viewmasters and 3D stereoscopy, flight simulators as developed in the 1960s, and Ivan Sutherland’s ‘Sketchpad’ ‘an interactive program that enabled a user holding a light pen to make designs on a screen that could be stored, retrieved and

superimposed' (Hillis 1999: 11). Later Sutherland developed the concept of the 'ultimate display' in which the computer would control the existence of matter, resonating with and extending earlier theories of 'total cinema'. Finally there is the development of head mounted displays, compared by Howard Rheingold to 'exceptionally bulky sunglasses', and data gloves which more fully enable the experience of virtual environments by in principle eliminating both the screen as interface and the bracketing out the perception of surrounding reality.

It is this suspension of one's lived spatial reality and its substitution with another that led many writers and developers to see in virtual reality dreams of transcendence of the body and hence to imagine it as the facilitator of a form of disembodiment. But there were always voices cautioning against this kind of approach. N Katherine Hayles, for example, argued in 1996 that 'As anyone who designs VR simulations knows, the specificities of our embodiments matter in all kinds of ways, from determining the precise configuration of a VR interface, to influencing the speed with which we can read a [...] screen' (Hayles 1996: 1). If there is nevertheless 'so much noise about the perception of cyberspace as a disembodied medium' (1996: 1), it is due to making a cut between the embodied experience of the user and the alternate virtual world, the attribution of more reality to the latter, due to the desire to leave the former behind, by disavowing the technical and perceptual process by which it is generated in the first place. This is a precise articulation of the differences between posthuman immanence and transhuman transcendence. The gendered nature of such fantasies of disembodiment hardly needs to be spelled out or repeated, and by now have been fully critiqued. Yet such desires and fantasies still attach themselves to VR, and are as hard to shake as the implications of its military origins, as artists like Harun Farocki have explored in works like *Serious Games III: Immersion* (2009). As more perceptive commentators like Hayles have noted, VR might have less to do with *Neuromancer's* fantasy of leaving behind the 'meat' of the organic body and more to do with pattern recognition: 'people have something to lose if they are regarded solely as informational patterns, namely the resistant materiality that has marked the experience of living as embodied creatures' (Hayles 1993: 73).

Such a polarization between transhuman and posthuman accounts of VR seems today to be exaggerated but is understandable in the context of 1990s speculations about VR and its future as a synecdoche for cyberspace itself. The idea that we were on the verge

of a world in which we would all be engaging in virtual environments for most of our activities (in an era when even email was relatively novel). In actual fact, the dreams and anxieties surrounding VR barely survived the late 90s dotcom crash and until recently it seemed consigned to being just another technological novelty, suitable for amusement parks and the peripheries of gaming. One problem was the hype itself which was basically impossible to live up to, and another was the level of technological development; certainly there were some admirable experiments in VR art, but their realisation was not the overwhelming technological experience it was supposed to be; in other words, the fantasies of immediacy, of surpassing the need for an interface, returned in the form of effects of hypermediacy in anything from the delay time of loading necessary information, to so called 'Alternate World Syndrome' which could leave some users in a state of nausea and disorientation. Taking as an example the 90s VR artwork 'Dancing with the Virtual Dervish', far from being an experience of disembodiment it was, in fact, all about kinesthetic and proprioceptive embodiment. Michael Heim describes the after effects of his two and a half hour experience with this work in the following terms:

Even the next day, my optical nerves held the imprint of the brightly coloured transhuman structures. I could summon them with the slightest effort – or see them sometimes in unexpected flashes of cyberspace. (Heim 1998: 51-52).

**[Insert figure 2 here, caption: Interactive Choreography in *Dancing with the Virtual Dervish* (1994), D. Gromala and Y. Sharir]**

Of course, much of this kind of embodied reaction or abreaction to virtual reality had to do with levels of technological development; too low a frame rate apparently produced such effects, a problem that has since been overcome in 21st Century VR apparatus's with much higher processing rates and hence the ability to generate relatively seamless virtual environments. But the problems with 1990s VR were not just a question of technical obstacles, high costs and lack of a clear idea of its potential uses; there was also a fundamental misperception of what its affordances and limits were, namely that what it enabled was not an experience of immediacy, of being transported into another body in another space, but just another modality of remediation to use Bolter and Grusin's term (see Bolter and Grusin 1999: 2-19). As with all forms of remediation there is no pure

immediacy attainable via technologies of perception, only an oscillation between immediacy and hypermediacy which are always mixed. This perhaps accounts for VR being eclipsed in favour of other technologies, principally the mobile smart phone and augmented reality developments that dominated the first decade of the 2000s, and which foreground rather than hide their processes of hypermediation. Nevertheless, in a nice irony, mounting a VR enabled phone within a headset has become a new way of generating VR experiences, rendering them cheaper and more accessible. Conversely the supposed next step forward in augmented reality in such devices as Google Glass has met with unanticipated unpopularity, in its adding of new layers of surveillance or at least interveillance to a world already saturated with such practices: don't objectify me into my data body, at least not so obviously.

This underlines the point that VR does not do away with the screen or interface, so much as render it imperceptible, displacing it to the non perceived display or even the retina. But how new is this process? Are cinemagoers ever aware that they are watching a screen when immersed in a spectacular cinematic presentation, especially when immersion is aided by HD or IMAX technologies, complex sound environments, or 3D effects? Is VR just the latest in a line of immersive audiovisual technologies, a kind of post-cinematic supplement or actually a medium or artform in its own right?

It may still be too early to give definitive answers to these questions, but other than medical, architectural and military uses of VR, it is now being developed largely as a way of producing supplementary content, extending the repertoire of games, cinema, especially animated cinema, music video and slightly more sophisticated versions of virtual environments already well known from MMORPG's like *World of Warcraft* or even *Second Life*. Certainly VR has progressed from being limited to use by either military-industrial or artistic elite projects, to becoming more available and accessible, as well as becoming commercialised as a desirable consumer product, but whether it will develop some of the artistic, let alone the ontogenetic potential imagined for it in the 1990s, still remains to be seen. Certainly if the works produced by the now defunct Oculus Rift Studio are anything to go by, things have not yet progressed all that far beyond Pixar animations.

Also, as Hito Steyerl has suggested, there are other limits to VR as a kind of 'bubble vision' in congruity with a range of 21<sup>st</sup> Century spherical technologies and architectures of seeing (Steyerl 2017). Steyerl references the philosopher Peter Sloterdijk's concept of

spheres as inherent to western metaphysics (see Sloterdijk 2011), and suggests we should be wary of this mode of experience of spherical alternate worlds, which she labels as an aesthetics of isolation. This raises the spectre of the VR user in full headgear clumsily banging into gallery walls and other people, since the payoff for a rich spherical, immersive VR experience is a bad relationship to exterior surroundings. However, the strongest resonance of VR with western metaphysics is really the monadology of Leibniz, which was presented in terms of so many impossible subject-centred points of view on a 'possible world' each closed off from the other, with only God seeing all of these worlds clearly. This Leibnizian resonance was not lost on early theorists of virtual reality like Michael Heim who saw Leibniz as laying the foundations for the emergence of cyberspace through his 'electric language' of symbology (Heim, 1993: 92-96). The question then for VR might be of how to 'overtake monadology with a "nomadology"' as Deleuze suggested in *The Fold* (1993: 137), by constructing and imagining ethical openings between individuated virtual reality spheres and other horizons of aesthetic potentiality, so that the monadic VR experience becomes 'astraddle over several worlds [and] kept open as if by a pair of pliers' (1993: 137).

Perhaps some richer inspiration for designing really ontogenetic VR experiences might rather be gained by re-engaging with the lesser known histories of abstract cinema, audiovisual experimentation and computer art presented here, which might form the basis of aesthetically rich, immersive, ontogenetic and open experiences. Something like a VR equivalent of *Twin Peaks The Return*, episode 8, which can be seen as a kind of negative Stargate Corridor, could be a more aesthetically challenging starting point for such experimentation than the insipid work of Oculus Studios. At any rate it seems important to find a point somewhere between the banality of discourses surrounding contemporary VR and the speculative spasms of the 1990s, in order grasp what is really, potentially new in VR as an aesthetic, ontogenetic machine, while remaining fully aware of both its limits and affordances.

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<sup>i</sup> This deep time of audiovisual media has been traced by Siegfried Zielinski in Zielinski (2006), *Deep Time of the Media: Towards and Archaeology of Hearing and Seeing by Technical Means*, trans. Gloria Custance, Cambridge, Massachusetts, London: MIT Press.