Cinematic Virtual Reality: The Paradox of the Omniscient Viewer in Omnidirectional Space versus Artistic Authorial Control

MEDIA HAQSHENAS
International Filmschule Köln

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The future of audio-visual storytelling might transcend the limits of the screen, allowing the spectator to enter the story or even become the protagonist around whom the story unfolds. This could lead to an art form that fundamentally changes our media consumption habits. My overall research question in this paper examines whether virtual reality (VR), specifically the cinematic virtual reality genre, will become the next defining audio-visual medium. I approach this inquiry as an open question, attempting to identify distinct aesthetics of cinematic VR that sets it apart from cinema. The goal is to equip creators aspiring to produce narrative VR experiences with a comprehensive understanding of not only the possibilities but also the challenges involved in this format, as the title implies.

Keywords: virtual reality (VR), cinematic virtual reality, VR film, 360-degree film, field of view (FOV), space, point of view (POV), narrative, plot

Introduction

In this academic text I attempt to provide an introductory overview for narrative virtual reality (VR) experiences both in terms of theories and practice. However, to gain a detailed understanding it is necessary to define various theoretical concepts such as 'immersion', 'interaction', 'agency', 'presence', and 'embodiment', among other factors. These notions are deeply rooted in theories of virtual reality with considerable intersects with game and media studies. Numerous papers and books have already examined these concepts extensively, namely, seminal works such as *Hamlet on the Holodeck: The Future of Narrative in Cyberspace* by Janet H. Murray (1997), and *Narrative as Virtual Reality 2: Revisiting Immersion and Interactivity in Literature and Electronic Media* by Marie-Laure Ryan (2015), which offer valuable insights into this field. Additionally, as we see in Chapter Two, narrative VR experiences can vary in shape and form. Therefore, in this paper, to remain focused on the research topic on cinematic VR genre, I choose to zoom in on VR experiences that resemble linear recorded media, where explicit interactions are minimal, except for the ability to view the 360-degree environment, akin to 360-degree films. I argue that this format is the most immediate version of cinematic VR, enabling us to address pertinent VR theories that are both worthwhile and compelling for this article's target audience, presumed to possess a general background in filmmaking.

Methodology

I begin this chapter by contextualizing my standpoint. With a background in filmmaking, and during the first semester of an interdisciplinary master's program at IFS International

Film School Cologne, where I had my initial exposure to immersive media, I decided to write this article to research the potential of virtual reality as a storytelling medium. At that time, I was in the development phase of my first 360-degree film, and this study aimed to familiarize me with the VR medium. Now, beyond this personal goal, this academic paper aims to introduce filmmakers and cinephiles to the formal composition of narrative virtual reality. My contribution aspires to provide introductory pragmatic knowledge about narrative VR experiences, particularly focusing on their aesthetics and narrative, rather than social, theoretical, or technological debates.

Recognizing a valid tendency in VR theories to transition into game studies, which can cause the main audience of this paper to lose the thread of the discussion, I have adopted an approach to assess VR compositional syntax that uses film language. This approach leverages the established nature of the film theories to make the concepts more understandable for an audience who are not necessarily VR experts but might be interested in experimenting with this format to tell stories, as some filmmakers have already started.

In this paper, I implicitly ask the open-ended research question whether the apparatus of virtual reality will become the next defining narrative audio-visual medium. I attempt to break down this question by first defining the cinematic VR genre in Chapter 2, and then providing a historical media context for this emergent medium in Chapter 3. In these chapters, my research method is a conventional literature review, developing the discussion by borrowing from well-cited authors. Once the foundations are established, I will explore the hypothesized distinct formal components for the narrative VR in Chapters 4 and 5, respectively. While I retain the method of literature review in the latter chapters, I selectively review papers with an empirical approach. In addition, in Chapters 4 and 5, I will observe the affordances of narrative VR by wearing my creator's hat, and directly conveying my practical experience while making the aforementioned 360-degree film to theoretical knowledge. I develop these theories by drawing analogies and comparing the VR medium with legacy media, specifically cinema and theater.

Understanding Cinematic Virtual Reality: A Literature Review

Cinematic virtual reality, also known as Cine-VR, VR Film, or in academic circles as CVR, refers to a narrative VR experience akin to linear film.[1] It offers an immersive head-mounted display-based experience (HDM), allowing individual spectators to explore a virtual environment, typically in a 360-degree setting. This can feature either stereoscopic (three-dimensional) or monoscopic (two-dimensional) views. Additionally, viewers often hear dynamic spatialized audio specifically designed to respond to sound sources as the viewer rotates their head.[2] Cinematic VR also serves as an umbrella term for manyfold varieties of narrative-based VR experiences or 360-degree films, as some researchers refer to cinematic VR "as 'Film VR' or 'Live Action VR,' with reference to its status as a lens-based cinematographic moving image practice and contrasting with the majority of VR experiences as computer-generated virtual worlds more akin to interactive gaming engines. [As – M.H.] the HMD [head-mounted display – M.H.] ap-

[1] The term 'linear film' refers to the traditional format of film, contrasting with contemporary digital narrative formats that allow for potential non-linear storytelling through direct user interaction, such as branching narratives and other innovative approaches like narrative VR.

[2] L. Tong, R.W. Lindeman, H. Regenbrecht, *Viewer's Role and Viewer Interaction in Cinematic Virtual Reality*, "Computers" 2021, no. 10(5), article 66; J. Mateer, *Directing for Cinematic Virtual Reality: How the Traditional Film Director's Craft Applies to Immersive Environments and Notions of Presence*, "Journal of Media Practice" 2017, no. 18(1); K. Dooley, *Storytelling with Virtual Reality in 360-Degrees: A New Screen Grammar*, "Studies in Australasian Cinema" 2017, no. 11(3).

paratus is the site of convergence for these two models, allowing viewers to accept both under the umbrella of VR."[3] Hence, in this regard, we can consider cinematic VR as frame-less filmmaking. At the other end of the spectrum, Dooley provides a more encompassing definition for cinematic VR, arguing that it is not limited to 360-degree films, but rather that is the most easily accessible form of VR film. Drawing insight from Dooley, cinematic VR appearance may vary from 360-degree videos, where the only explicit interaction for viewers is to choose where to look, to complex computer-generated experiences, where the viewer can choose from multiple branches or even interact with objects and characters within the scene.[4]

At the same time, concerning etymology, I am personally of the opinion that the term 'VR' could be recoined, for instance, based on a Latin or Greek word with multifaceted connotations, as in the case for 'cinema', as the current names convey a very narrow and technology-driven definition for this emergent medium that is still young enough to follow different paths. Moving forward, I switch between the terms VR film, cinematic VR, and narrative VR experience as a matter of personal appeal, consciously dropping the acronym CVR (however, I do not change it in citations). It is important to recognize that there are numerous overlaps in terminology. In general, when I mention VR film, I am either referring to a 360° film or a 'narrative' immersive VR experience more akin to a film rather than a game, both in terms of aesthetics and its respective target audience.

From a technological perspective, "to produce CVR [here the author assumes cinematic VR as a 360° film – M.H.] the apparatus consists of an omnidirectional camera rig fitted with multiple cameras or a single camera with multiple lenses. The cameras typically utilize ultra-wide or 'fisheye', curved lenses which, when combined, expand the field of view to capture an environment in 360-degree scope. Typically, the fixed camera(s) takes the place of the 'idealized viewer' to capture multiple images which require post-production 'stitching' to map together into a 'flattened' panoramic image [often referred as equirectangular – M.H.] that can be reconstituted as a spherical field of view in the headset, or for viewing on a flat screen by moving the cursor."[5] The individual footage is seamlessly stitched together into a single spherical video, ensuring consistent color and contrast across all shots.[6] Generally, the creators hide the view toward the camera support, either by cropping that part of image or blurring it in post-production. At the opposite end of the spectrum, certain narrative VR titles have a mixed media approach utilizing emerging technologies like volumetric videography or photogrammetry. Meanwhile, other titles like 3D virtual worlds rendered in real-time by a game engine, unlike 360-degree films, offer a more participatory experience by incorporating interaction and movement possibility for the viewer.

"From a content point of view, we use the prefix 'cinematic' or 'narrative' to define those VR experiences that are narrative-based, instead of purely for, novelty, entertainment, exploration, [training simulations, EdTech, MedTech – M.H.], etc."[7] What is more, thus far, VR films experiences have often tended to have a short duration, due to technological inadequacies such as insufficiency of ergonomics in HMDs and motion sickness. Moreover, according to Ijäs, many VR films are continuous long-take films presented as if in real-time, although editing is beginning to be explored more widely.[8] Another observable trend from the market per-

[3] M. Ross, A. Munt, *Cinematic Virtual Reality: Towards the Spatialized Screenplay*, "Journal of Screenwriting" 2018, no. 9(2), p. 192.
[4] K. Dooley, op. cit.
[5] M. Ross, A. Munt, op. cit., p. 194.
[6] F. Nielsen, *Surround Video: A Multihead Camera Approach*, "The Visual Computer" 2005, no. 21(1).
[7] L. Tong, op. cit., p. 1.
[8] N. Ijäs, *Transitioning Between Worlds Editing and Pre-Production in Cinematic Virtual Reality*, Master thesis, Aalto University of Art, Design and Architecture 2016.

spective in VR film contents is the tendency to put the spectator into magnificent situations that are impossible or very unlikely to be physically experienced by a human, situations like an expedition to such formidable places as Mount Everest, as in *Everest VR*[9] *and National Geographic Explore VR*,[10] seeing extinct animals of the past in their habitat, as in many dinosaur VR experiences, or tours in ruined old cities of antiquity like *Bagan*.[11] These narrative VR experiences are also usually accompanied by surround sound enhancement, featuring pre-recorded 360-degree videos coupled with 3D scans/rendered scenes, and strive to fulfill the viewer with a sense of awe, taking advantage of 'virtual' reality capabilities. Another major type of VR content concerns transmedia products made around a TV-series or blockbusters, such as *Mr. Robot Virtual Reality Experience* (2016),[12] which created a narrative digression by offering fans a flashback journey to an unbroadcasted event in the series' story world, or HBO's *Westworld Awakening* (2019)[13] designed for *Westworld* series. *Save Every Breath: The Dunkirk VR Experience* (2017)[14] is another example, which mainly served as a promotion trailer for the actual linear film *Dunkirk* (2017). As Freyermuth explains, the creators of these transmedia practices "starting in the pre-production phase, also try to build supporting communities through social web activities, blogs, YouTube channels, Tweets, or e-books … What they offer in addition to their main medium usually fluctuates between genuine extensions of the original story and pure marketing."[15] Moreover, a noticeable niche concerns VR films with a focus on social subjects to raise social awareness of their subject matters through the empathy facilitated by immersive media. To name a few: *Traveling While Black* (2019),[16] *MLK: Now is the Time* (2023),[17] *Anne Frank House VR* (2018)[18] and *VR for Good*.[19] Meanwhile, creators with an affinity for journalism are also increasingly turning to VR in the context of documentary, as it allows for a more realistic and immersive way to tell a story, enabling empathy, which is often not achieved with simplified text-based journalism. Examples include *6x9: A Virtual Experience of Solitary Confinement* (2016),[20] *Home After War* (2019),[21] and *After Solitary* (2019).[22] It is worth noting that at the time of writing this article, mature distribution channels were still limited to festival participation, standalone websites for each VR title, game platforms such as Steam,[23] and platforms by manufacturers

[9] https://www.oculus.com/experiences/rift/1043021355789504/ (accessed: 13.11.2024).
[10] https://www.oculus.com/experiences/quest/2046607608728563/ (accessed: 13.11.2024).
[11] https://artsexperiments.withgoogle.com/bagan (accessed: 13.11.2024).
[12] https://www.youtube.com/watch?v=JADKYKWLO9s&t=2s (accessed: 13.11.2024).
[13] https://store.steampowered.com/app/1133320/Westworld_Awakening/ (accessed: 13.11.2024).
[14] https://www.youtube.com/watch?v=caCRw9eCKeE (accessed: 13.11.2024).
[15] G.S. Freyermuth, *Transmedia Storytelling. Twelve Postulates*, "Clash of Realities 2015/16: On the Art, Technology, and Theory of Digital Games", [in:] *Proceedings of the 6th and 7th Conference*, Bielefeld, transcript 2017, p. 98.
[16] https://about.meta.com/community/vr-for-good/traveling-while-black/ (accessed: 13.11.2024).
[17] https://www.oculus.com/experiences/quest/4790561384366997/ (accessed: 13.11.2024).
[18] https://www.annefrank.org/en/about-us/what-we-do/publications/anne-frank-house-virtual-reality/ (accessed: 13.11.2024).
[19] https://about.meta.com/community/vr-for-good/?utm_source=www.oculus.com&utm_medium=redirect (accessed: 13.11.2024).
[20] https://www.theguardian.com/world/ng-interactive/2016/apr/27/6x9-a-virtual-experience-of-solitary-confinement (accessed: 13.11.2024)
[21] https://www.meta.com/en-gb/experiences/home-after-war/2900834523285203/?utm_source=www.homeafterwar.net&utm_medium=oculusredirect (accessed: 13.11.2024)
[22] https://store.steampowered.com/app/650460/After_Solitary/ (accessed: 13.11.2024).
[23] https://store.steampowered.com (accessed: 13.11.2024).

of VR goggles like Viveport[24] and Oculus Store.[25] Additionally, my personal experience is that VR products are occasionally restricted to specific hardware platforms, and their installation and reception still demand a certain level of digital literacy, further limiting their accessibility.

Last but not least, from the audience perspective, "we consider CVR and videogame audience to mainly have different motivations, so they likely comprise different demographics."[26] Gamified VR experiences often market their interactive features to their audiences, aiming to provide both an immersive and interactive experience. They achieve this by utilizing controllers, avatar embodiment, or offering tactile feedback through vibrating body suits. On the other hand, companies like Meta and Apple are actively promoting and creating demand for spatial computing and generative 3D virtual worlds, also known as metaverse. In these environments, the boundary between virtual reality and augmented reality appears to blur. Again, I do not consider the audience for these phenomena to be the primary audience for cinematic virtual reality, as despite sharing the same media consumption hardware, they stem rather from distinct social and economic backgrounds. To be specific, I consider the audience for cinematic VR to be the next generation of cinephiles. Just as cinephiles have historically watched films in auditoriums, on TV, through home video, and on video on demand services, the idea of watching films (360° or even linear films) in VR goggles does not seem particularly futuristic. Therefore, I define the audience for cinematic VR as those seeking an experience akin to the roots of lean-back recorded media: an audience who is comfortable with essential forms found within the universe of cinema. Hence, in the near future, I expect a balance to be struck between the audience's demand for mature VR narratives and the supply of these, provided by more professional creators rather than academics or technologists. Following this, the emergence of a common formal syntax for VR films similar to the established film grammar pioneered by D.W. Griffith in the early days of cinema, which reached maturity in Hollywood in the 1940s, is clearly conceivable. I also acknowledge that the social acceptance of VR, as with every emerging technology, is a controversial and vast topic on its own that falls outside the focus of this text.

Historical Media Context For Virtual Reality

In his book *Virtual Art: From Illusion to Immersion* (2002), the German art historian Oliver Grau formulates 'immersion' as the key, yet often overlooked, piece of the puzzle in tracing the development of art and media. He defines immersion as a mental process that signifies a transition from one state of mind to another.[27] He further elaborates this definition: "It is characterized by diminishing critical distance to what is shown and increasing emotional involvement in what is happening […where] the intention is to install an artificial world that renders the image space a totality or at least fills the observer's entire field of vision."[28] In the same regard, Freyermuth affirms that there has been a historical longing for a 'total work of art,' or Gesamtkunstwerk in its original German form, which is a merger of all separate mediums into a seamless whole. He argues that this wish found its partial realization with the advent of cinema, as a container for photography, architecture, painting, music, poetry, etc. But later, he remarks, cinema could not account for the level of immersion envisioned for a total work of art primarily.[29] In the same paper, Freyermuth, paraphrasing from Stafford, provides an overview to observe the counteracts against the

[24] https://www.viveport.com (accessed: 13.11.2024).
[25] https://www.oculus.com/experiences/quest/ (accessed: 13.11.2024).
[26] L. Tong, op. cit., p. 2.
[27] O. Grau, *Virtual Art: From Illusion to Immersion*, MIT Press, Massachusetts 2002.
[28] Ibidem, p. 13.
[29] G.S. Freyermuth, op. cit.

concept of frame in visual art practices through history when he describes "in the 17th and 18th centuries, endeavors as diverse as the utopian conception of the total work of art, 'Curiosities Cabinets,' 'trompe l'oeil frescoes,' and the 'Panorama' tried to overcome the limitations of representation within the analog image space [i.e. the dogmatism of the frame – M.H.]."[30] To add upon, such endeavors could likewise be traced in the 19th and 20th centuries with the proliferation, respectively of still stereoscopic images and prop-masters accessible to a mass audience. Therefore I infer that besides a desire for a total work of art that gathers together different mediums under a self-contained medium, there has also been a wish to enter the frame. If we consider the Renaissance-era figure Leon Battista Alberti, who metaphorically described the painting canvas as a 'window' to the world, we can see a longstanding desire to open this 'window' on the represented landscape and step into it, rather than gazing at the landscape from distance behind the window. A further proof for the historical urge to pass through the frame is detectible noticing that although "(…) the CVR [cinematic VR – M.H.] experience trades on the viewer's perception of a holistic 360-degree environment – it remains a spatial illusion generated from two-dimensional image(s). This illusory capacity of CVR has a rich media archaeology, from still stereoscopic images and magic lantern slides to Georges Méliès' magician-inflected filmmaking, the development of deep-focus cinematography and the immersive stereoscopic (3D) cinema."[31] However, in my view, such attempts to force a 3D illusion from a 2D image are not firstly mature and widely practiced enough, thus they do not have remarkable aesthetics worth building the foundations of a potential imagery framework for narrative VR on top of them.

Fast forwarding to the current era, Freyermuth, in the same article, provides a bridge to our contemporary times, by speaking about 'software,' as a new apparatus that has addressed, (1) the lack of a holistic site (a total work of art) for production and reception of separate analog media, and (2) the absence of immersion in analog media due to their hardware framing and/or audience distancing. However, in opposition to the absence of immersion in analog media, Ryan describes the novel as an immersive medium, stating "metaphors of language dramatize the reading experience as an adventure worthy of the most thrilling novel: the reader plunges under the sea (immersion), reaches a foreign land (transportation), is taken prisoner (being caught up in a story, being a captured audience), and loses contact with all other realities (being lost in a book)."[32] Freyermuth goes on to say that virtualization put different media on the same level for the first time, as separate analog mediums' content "could be produced virtually and stored within the universal transmedium of software,"[33] pointing out that this fusion of media in software helps established academic disciplines, such as fine arts, film, literature, and theater to overcome their strict and restricting subject boundaries.[34] For instance, in our case, VR films could be interpreted as the emancipation of cinema from what Alejandro González Iñárritu calls "the dictatorship of the frame."[35] In a broader sense, we could view the fusion and liberation of established art forms as a positive development, since aesthetics evolves by challenging traditional rules and conventions, creating a sense of unfamiliarity in the context of formalist art theory.

[30] G.S. Freyermuth, op. cit., p. 100; B.M. Stafford, F. Terpa, I. Poggi, *Devices of Wonder: From the World in a Box to Images on a Screen*, Getty Research Institute, Los Angeles 2001.
[31] M. Ross, A. Munt, op. cit., pp. 194–195.
[32] M.-L. Ryan, *Narrative as Virtual Reality 2: Revisiting Immersion and Interactivity in Literature and Electronic Media*, John Hopkins University Press, Baltimore 2015, p. 93.
[33] G.S. Freyermuth, op. cit., p. 106. See also L. Manovich, *Software Takes Command*, Bloomsbury Publishing USA, New York 2013.
[34] G.S. Freyermuth, op. cit., p. 106.
[35] Los Angeles County Museum of Art [LACMA] 2017, https://www.lacma.org/art/exhibition/alejandro-g-inarritu-carne-y-arena-virtually-present-physically-invisible (accessed: 13.11.2024).

Omnidirectional Space

While cinematic VR aligns with the artistic aims of painting, photography, and cinema, its spherical view disrupts the conventional perspective, challenging the traditional beyond-the-frame viewing position.[36] The struggle is to come up with new strategies for image composition. To put it into action, we need to think of circular geometry: a paradigm shift from square to circle. VR experiences have no screen edge, and their surround image dissolves the viewer in themselves. This contrasts with classic fine arts, where a human's awareness of their visual perception has been limited by merely examining the framed images. Consequently, it would be hard to perceive how we see and experience the 360-degree atmosphere if we merely studied visual arts. In terms of understanding the human vision and spatial experience of an environment, it could be beneficial to refer to cognitive science, architecture, and game studies, respectively. However, delving into these topics would go beyond the scope of this introductory paper, which aims to provide a broad overview.

In this regard, the first concept I would like to tackle is field of view, also usually referred to as field of view (FOV) in the VR context. FOV indicates the extent of the visual environment that a person can see through HMD at any given moment. In VR, the FOV changes as a result of the viewer rotating and changing their gaze perspective. I believe that in VR the changes in FOV are not predictable *per se*, and vary between each individual viewer. The FOV changes are based on viewers' subjective preferences and habits coming from their VR product consumption and general audiovisual media exposure. On the other hand, VR authors implement audiovisual cues to retain their authorial control and to direct the viewer's gaze to the preferred field of view – the FOV that the main action and narrative are taking place in. "A user in CVR [cinematic VR – M.H.] is only able to look in one specific direction at any given time, meaning that other parts of the narrative environment are not visible, as is the case with action off-screen in film."[37] And this becomes of great importance, as Ross and Munt discuss when we consider that narrative in cinematic VR is going to be spread, as narrative installments, all over the 360-degree environment, where the idealized viewer/VR camera rig is at the center.[38] In the same vein, empirical research by Gödde et al. found that in VR experiences there is a blind spot of about 50 degrees, where elements will most likely be ignored or missed by the viewer.[39] Such an assumed blind spot could be interpreted as off-screen space in 2D film, or as an analogy, the world of narrative in VR could end at the edges of this blind area, akin to how the world beyond the table figure in still life paintings ends. The existence of such a hypothesized blind area could be something of a comfort zone for VR directors, allowing them to retain greater control over the audience's gaze. In the same regard, Ross & Mund enlighten us that:

> there can be a flux between the use of full 360-degree space and more contained FOV like in 180-degree films. As VR films are stitched image blocks, it is possible to crop out parts of the image for artistic purposes, making the experience less circular but not entirely 2D [rectangular – M.H.]. However, not many creators have attempted to confine the space, while mostly adhering to the whole 360-degree round virtual environment. In the same vein, for example, positioning the camera close to a wall, door or other hard surface creates space that is unlikely to be looked at, [as it is a – M.H.] 'dead' [space – M.H.], without the possibility of action… [also useful to

[36] E. Panofsky, *Perspective as Symbolic Form*, trans. Christopher S. Wood, Zone Books, Michigan 1997.
[37] J. Mateer, op. cit., p. 10.
[38] M. Ross, A. Munt, op. cit.
[39] M. Gödde et al., *Cinematic Narration in VR – Rethinking Film Conventions for 360 Degrees*, [in:] *Virtual, Augmented and Mixed Reality: Applications in Health, Cultural Heritage, and Industry: 10th International Conference, VAMR 2018, Held as Part of HCI International 2018, Las Vegas, NV, USA, July 15–20, 2018, Proceedings, Part II*, eds. J.Y.C. Chen, G. Fragomeni, Springer, Berlin and Heidelberg 2018.

> consider – M.H.] how rhythms between extended and constrained views can be used in conjunction with the narrative…[40]

To put it simply, VR directors struggle to reconcile editorial control, achieved by confining the changing field of view, with the unnegotiable promised immersivity of VR technology. It is a paradox between omni-directional imagery and uni-directional control. As a response to this dilemma, a VR director has two options: (1) Try to draw the viewer's attention to the right action, whether with changing the mise-en-scène, like a change in lighting or moving an object/character/camera or an audio cue, especially as our ears, unlike our eyes, are not focused in one direction, making omnidirectional audio cues in VR an effective orientation tool. (2) Avoid any explicit guidance and intentionally disorient the viewer within the space. Here the focus is on making space itself the main character. Consequently, the viewer's attention is not directed to a specific point; instead, they are consistently observing the protagonist (the space) regardless of the direction they are looking at. The latter approach creates a feeling of immediacy and freedom for the viewer to look around, which is an inherent feature and promise of 360-degree film imagery. This immediacy could be explored further, particularly in the realm of documentary filmmaking.

So far, I have discussed the overall nature of spherical space in VR. Naturally, the omnidirectional space of narrative VR occasionally features characters, and the imagery characteristics of VR discussed here eventually affect the viewer's visual perception of those characters. To exemplify this, if a character in a VR environment is seated and then stands up, a viewer experiencing the VR film in a seated position will tilt their head up to keep the character in their field of view. In film language, this results in a shift from an eye-level shot to a low-angle shot. While the same action in a linear film can be executed with a camera tilt too, that would not be the only option. In standard continuity film grammar, such an action of a character standing up from a seated position is often split in a match cut between two shots with different perspectives. Hence, unlike cinema, where we can hide the dead time of acting through montage and decoupage, in VR, such dead time (in the context of our example the action of a character standing up from a seated position and moving elsewhere) is likely to be shown in real time due to the unappealing and jumpy nature of short cuts in VR. In other words, the acting time and space in VR, as a spatial medium, is more akin to performative arts than to cinematic performance, while in cinema, the carefully controlled frames featuring characters are reminiscent of the depiction of figures in paintings. In addition, the fisheye lenses of 360-degree cameras distort any subject within a range closer than one meter, which limits the use of close-up shots and other close shots such as insert shots. This limitation further aligns actor performance in VR environments with performative art roots.

In the same vein, with regard to character blocking in *mise-en-scène*, Pope et al. present[41] a comparison between the narrative use of space in theatre and VR-based content. Specifically, they emphasize that VR film directors can draw inspiration from stage actor blocking. According to Pope et al., for instance, like theater, high-status characters can be given more physical space around them, aligning with research that reveals those with the most speaking rights tend to have more space around them. Likewise, inspired by theater, they suggest positioning the sympathetic character(s) significantly closer to the camera/viewer (idem). Therefore, I argue that in VR film, instead of utilizing 2D space within frame sizes like close-ups, medium shots, and wide shots, actors could dynamically engage in 3D spatial interpersonal interactions, not only with each other but, most

[40] M. Ross, A. Munt, op. cit., p. 21.

[41] V.C. Pope et al., *The Geometry of Storytelling: Theatrical Use of Space for 360-Degree Videos and Virtual Reality*, [in:] *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems*, Denver 2017.

importantly, with the viewer/camera. In this sense, the role of choreography and employing techniques akin to those used in theatre naturally becomes highly important. This has led VR creators to adopt 'spatial' storyboards, which are closer to floor plans instead of classic film framed 2D storyboards. In fact, performative arts venues such as prosceniums traditionally employ stage diagrams to delineate available spaces for performance, partitioning the set into various sections such as stage center, stage right, downstage left, upstage right, and so forth. Drawing inspiration from these conventions may prove advantageous for the refinement of spatial storyboarding and the development of pragmatic terminology for filmmaking in virtual reality.

Building on VR's specific attributes and complications regarding the narrative space, as discussed in previous paragraphs, to further improve our understanding of the omnidirectional space of VR, I conclude this chapter by contextualizing the media culture in which the narrative VR experiences are being created. Freyermuth discusses how a shift in storytelling is discernible in our times. He considers the aesthetics of 'world-building' to be a key feature of narratives in digital cultures by driving our attention to the shift from plot development / succession to spatial exploration in worlds / layering.[42] However, while such environmental storytelling is more commonly explored in gamified VR experiences, it appears increasingly in cinematic VR experiences as well.

Omniscient Viewer

Paralleling the paradox of VR's ever-changing field of view and the director's struggle to control imagery, when VR creators work on a VR narrative, they encounter a similar dilemma, a 'narrative paradox,' so to speak. This tension arises from the viewer's desire for freedom of choice versus the director's control over how the narrative unfolds. The paradox lies in the omniscient viewer's potential to manipulate the plot versus the VR experience creator's wish to steer the sequence of events in plot. Now, with a formalist lens, according to Bordwell, a plot is not only shaped from narrative devices, such as dialogues, narrations, etc., but also stylistic devices, such as framing, lighting and sound.[43] Hence, we can naturally argue that the VR viewer's ability to manipulate the plot(narrative) arises from their freedom to look at different fields of views (a stylistic tool) in the 360-degree space, potentially overlooking or downplaying certain narrative bits in one FOV while focusing intensely on another FOV.

Now, I explore the notion of 'point of view' (POV) and its role in VR, which is closely related to the changing FOV and plot manipulation affordances of VR. The medium of VR places significant emphasis on its viewer's point of view. I would argue that this emphasis on POV is even more pronounced than in legacy media. As a matter of fact, VR by design 'demands' putting the emphasis on the 'role' of POV; in other words, VR needs to justify the viewer's role. I argue that this emphasis is a result of the physics of VR medium. VR pairs of lenses are positioned very close to the viewer's eyes, and the audio output is in close proximity to the viewer's ears, making VR one of the most physically proximate audiovisual reproduction mediums to the human body. The tangible VR apparatus' physical proximity to its audience, in addition to its haptic feel on viewer's face, and more importantly, the complete detachment of spectator from audiovisual reality, enhances the medium's physical and consequently psychological subjectivity. This leads to an inherent focus on the viewer's role. However, in cinema or theater, the audience experiences physical distance from the image plane, whether this be the 'screen' in the context of cinema or the 'stage' in the theatrical context. This physical distance could 'potentially' make the experience more distanced and objective, not to mention that,

[42] G.S. Freyermuth, op. cit., pp. 118–121.
[43] D. Bordwell, K. Thompson, J. Smith, *Film Art: An Introduction*, McGraw Hill, New York 2024.

unlike VR, the sense of apparatus haptics and a total absence from reality in these mediums are not usually at interplay.

According to Syrett et al., transitioning from a 2D flat video to an immersive medium, it is unsurprising that researchers have observed a significant shift in point of view (POV). In immersive media, the viewer is positioned at the center of the scene, as opposed to observing a rectangular flat screen.[44] With "this new POV [assuming at the center of the scene – M.H.], the viewer becomes the narrator, since they can choose what to look at and what to understand."[45] In other words, the viewer's role is tied to different narrative POVs.

Like literature and cinema, narrative VR experiences can offer various points of view to their audience. In many VR pieces, the viewer is placed directly in the story through a first-person point of view. This perspective usually makes the viewer the protagonist, immersing them fully in the narrative. They see the world through the character's eyes and experience events as if they are happening to them. First-person POV often involves a higher level of interactivity, with viewers making choices that affect the environment. Sometimes the plot cannot move forward without the interactor's participation, making the narrative time and space proportional to the viewer's interactions. Alternatively, some VR experiences position the viewer as an invisible, passive spectator observing the story from a third-person point of view. In this role, the viewer witnesses the events unfolding without directly influencing them. This perspective has been likened to that of a ghost, observing the world without being seen or heard. At the same time, it is possible to draw an analogy between the VR camera in this POV and a surveillance camera's perspective. This POV lets viewers keep a distance from the characters and events, making it ideal for reflective stories, which is a common practice in VR documentaries. In certain cases, the viewer assumes a second person POV, receiving social acknowledgment from other characters, typically addressed with the pronoun 'you' or receiving glances from other characters. While the second person POV has been used rarely in legacy media, it remains a popular choice in interactive fiction due to its sense of immediacy and immersion.

Naturally, these POVs could change in one piece, just as novels and films have an established practice of doing so. However, as discussed earlier, due to the extra functions of VR mentioned here, the viewer's role and their assigned POVs become more sensitive subjects compared to legacy lean-back, distanced media. Now, this could be either the strength of a VR piece or its weakness. In addition, due to the discussed proximity of VR, embodying a character's POV firsthand or observing other characters up close can deeply affect viewer empathy and feelings, which creators should handle responsibly. Overall, the most effective POV tailored for cinematic VR is one that makes the viewer feel that they could not have had this 'experience' in any other medium but VR. As the time of writing this article, opting for the VR medium to narrate a story remains a bold artistic decision, demanding validation from creators. This validation is crucial for various purposes, including securing funding and pitching ideas, as well as maintaining the balance between form and content. I argue that considering the role of the viewer (narrative POV) is paramount in meeting the standards of this social validation process.

Conclusions

In conclusion, while the exploration of narrative VR experiences reveals a multifaceted landscape influenced by concepts such as im-

[44] H. Syrett, L. Calvi, M.S. Van Gisbergen, *The Oculus Rift Film Experience: A Case Study on Understanding Films in a Head Mounted Display*, [in:] *Intelligent Technologies for Interactive Entertainment: 12th EAI International Conference, INTETAIN 2020, Virtual Event, December 12–14, 2020, Proceedings*, eds. N. Shaghaghi et al., Springer, Berlin and Heidelberg 2017.

[45] L. Tong, op. cit., p. 4.

mersion and interaction, which have been subject to debate extensively in other literature, this study focused on VR experiences akin to linear recorded media (films) for a more streamlined analysis of topics such as field of view, point of view, and plot succession in the context of established general film language. This paper identified an inherent paradox in VR format, which lies between the simultaneous viewer freedom and creator's directorial control. In fact, this hypothesis posits that in VR design there is an inherent tension between the viewer's agency in interpreting the story in an uncertain way and the VR creator's attempts to retain artistic control in unfolding the narrative. This tension is not unique to the VR medium. However, through this study, I have argued that the functions of virtual reality as an art medium – specifically, the significant authority and interpretative freedom granted to the spectator, which are less pronounced in legacy formats—have intensified this tension compared to VR's predecessors.

In this regard, this article identified two primary formal affordances of VR that contribute to this paradox: (1) the omnidirectional nature of space and (2) the omniscient viewer seeking to identify their role. These two represent a paradigm shift, where the audience becomes the primary author and narrator of the work. I acknowledge that this emphasis on viewer participation and freedom may evoke comparisons to games. However, delving into this perspective was outside the scope and focus of this article.

Last but not least, I am conscious that both the literature review conducted and my personal discussions have focused on narrative space, while narrative time and specific temporal considerations are absent from this research. Indeed, time is a crucial aspect of any narrative vehicle, especially when considering its proportional and interdependent relationship with space across various narrative mediums. Ultimately, this introductory piece lays the groundwork for cinephiles to delve deeper into researching and exploring narrative VR experiences. Despite the challenging nature of storytelling in VR, it shows significant potential to become a major narrative form in the near future.

BIBLIOGRAPHY

Bordwell David, Thompson Kristin, Smith Jeff, *Film Art: An Introduction*, McGraw Hill, New York 2024.

Dooley Kath, *Storytelling with Virtual Reality in 360-Degrees: A New Screen Grammar*, "Studies in Australasian Cinema" 2017, no. 11(3), pp. 161–171. https://doi.org/10.1080/17503175.2017.1387357

Freyermuth Gundolf S., *Transmedia Storytelling. Twelve Postulates*, "Clash of Realities 2015/16: On the Art, Technology, and Theory of Digital Games", [in:] *Proceedings of the 6th and 7th Conference*, Bielefeld, transcript 2017, pp. 97–126.

Gödde Michael et al., *Cinematic Narration in VR – Rethinking Film Conventions for 360 Degrees*, [in:] *Virtual, Augmented and Mixed Reality: Applications in Health, Cultural Heritage, and Industry: 10th International Conference, VAMR 2018, Held as Part of HCI International 2018, Las Vegas, NV, USA, July 15–20, 2018, Proceedings, Part II*, eds. Jessie Y.C. Chen, Gino Fragomeni, Springer, Berlin and Heidelberg 2018, pp. 184–201.

Grau Oliver, *Virtual Art: From Illusion to Immersion*, MIT Press, Massachusetts 2002.

Ijäs Nina, *Transitioning Between Worlds Editing and Pre-Production in Cinematic Virtual Reality*, Master thesis, Aalto University of Art, Design and Architecture 2016.

Manovich Lev, *Software Takes Command*, Bloomsbury Publishing USA, New York 2013.

Mateer John, *Directing for Cinematic Virtual Reality: How the Traditional Film Director's Craft Applies to Immersive Environments and Notions of Presence*, "Journal of Media Practice" 2017, no. 18(1), pp. 14–25. https://doi.org/10.1080/14682753.2017.1305838

Nielsen Frank, *Surround Video: A Multihead Camera Approach*, "The Visual Computer" 2005, no. 21(1), pp. 92–103. https://doi.org/10.1007/s00371-004-0273-z

Panofsky Erwin, *Perspective as Symbolic Form*, trans. Christopher S. Wood, Zone Books, Michigan 1997.

Pope Vanessa C. et al. *The Geometry of Storytelling: Theatrical Use of Space for 360-Degree Videos and Virtual Reality*, [in:] *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems*, Denver 2017.

Ross Miriam, Munt Alex, *Cinematic Virtual Reality: Towards the Spatialized Screenplay*, "Journal of Screenwriting" 2018, no. 9(2), pp. 191–209. https://doi.org/10.1386/josc.9.2.191_1

Ryan Marie-Laure, *Narrative as Virtual Reality 2: Revisiting Immersion and Interactivity in Literature and Electronic Media*, John Hopkins University Press, Baltimore 2015.

Stafford Barbara M., Terpak Frances, Poggi Isotta, *Devices of Wonder: From the World in a Box to Images on a Screen*, Getty Research Institute, Los Angeles 2001.

Syrett Hannah, Calvi Licia, Marnix S. van Gisbergen, *The Oculus Rift Film Experience: A Case Study on Understanding Films in a Head Mounted Display*, [in:] *Intelligent Technologies for Interactive Entertainment: 12th EAI International Conference, INTETAIN 2020, Virtual Event, December 12–14, 2020, Proceedings*, eds. Navid Shaghaghi et al., Springer, Berlin and Heidelberg 2017, pp. 197–208.

Tong Lingwei, Lindeman Robert W., Regenbrecht Holger, *Viewer's Role and Viewer Interaction in Cinematic Virtual Reality*, "Computers" 2021, no. 10(5), article 66, pp. 1–17. https://doi.org/10.3390/computers10050066