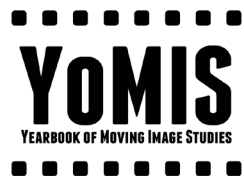


Mixed Reality Images



Lars C. Grabbe, Patrick Rupert-Kruse,
Norbert M. Schmitz (eds.)

Mixed Reality Images

Trilogy of Synthetic Realities III



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Lars C. Grabbe, Patrick Rupert-Kruse & Norbert M. Schmitz
October 2023

Inhabitable Bodies: On Embodying Virtual Reality Experiences¹

Anna Caterina Dalmaso

Abstract

Virtual reality has been repeatedly presented as a medium capable of providing effective first-person experiences and even as an opportunity to transcend the limitations of physical embodiment. As a result, immersive environments are often understood as a rearticulation or remediation of the figure of point-of-view shot, which dominates contemporary mediality. But, how does virtual reality actually engage with the possibility of inhabiting a different body, to provide us with a prosthetic or augmented body? The chapter tries to outline a phenomenological analysis of the conditions of embodiment elicited by contemporary immersive environment, by focusing on: 1) how the virtual dimension does not replace the real with the experience of an “alternative” reality, but gives rise to a two-way movement, since the virtual space is simultaneously augmented by the real; 2) how immersive interfaces put us in contact with a constantly actualizing reality, which unfolds in real time, to the detriment of any representational or referential component; and 3) how virtual environments confront us with an image which generates in accordance with the embodied movement of its experiencer, the living body being the pivot of a process of performativity, shared by the immersants’ bodily movement and the virtual image.

Keywords

Virtual reality, point-of-view shot, first-person shot, embodied experience, augmented virtuality, presence, frame, performativity

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1. Virtual Reality as First-Person Media?

Virtual reality is a medium still in search of a specific form of expression and creative grammar and still in the process of becoming institutionalized, which is why the present state of virtual reality technologies is similar, in many ways, to the early phase of cinema history. In many respects, the settings of virtual reality experiences could be easily classified under the notion of “attraction” elaborated by new film history (Golding 2019) to describe spectatorship of early film audiences as focused on the technology rather than on the content conveyed by it, that is to say, more interested in experiencing the novelty of cinema as a medium and technology, than in the films that were projected (Gunning 1990, Gaudreault and Gunning 1989, Strauven 2006). In the context of virtual environments, the “attraction” effect revolves around the strong sense of presence and so-called “place illusion” (Slater 2009) that are made possible by the interface, through the simulation of plausible sensorimotor contingencies.

Precisely because of this effect, immersive experiences, ranging from VR cinematography to gaming, displaying or hybrid contents, demand a reassessment of our understanding of aesthetic experience and spectatorship. The sense of presence conveyed by immersive technologies is able to challenge the user’s awareness of mediation and their image consciousness. In such a germinal phase, the analysis of storytelling strategies, narrative and normative discourses is just as important as focusing on a phenomenological analysis of VR technologies and their implementations in terms of aesthetic strategies.

The spectators, whom we should rather call “immersants,” wearing a head-mounted display, are suddenly enveloped in a virtual unframed 360-degree environment, which conveys a feeling of “being there” that vividly imposes on the senses the impression of inhabiting another reality. Presence studies have played a pioneering role by focusing on how remotely operated machinery and virtual reality technologies (Held and Durlach 1992, Slater 2003 and 2018, Farocki 2004, Calleja 2011, Lombard et al. 2015, Paulsen 2017) can elicit the feeling of being in a place other than our physical location, defined as a sense of “immediate transparency” (Bolter and Grusin 1999) and as a “perceptual illusion of non-mediation” (Lombard and Ditton 1997).

Nowadays, since the new wave of virtual reality began in the early 2010s, virtual reality has been repeatedly presented as a medium capable of providing effective first-person experiences (Mateer 2017, 14) and to put the immersants “in the shoes” of other individuals. This way to understand VR, that has characterized public discussion, is mainly due to the fact that the goal of a large part of immersive contents was very much concerned with humanitarian and prosocial objectives (Rose 2018), in the belief that virtual reality represents the “ultimate empathy machine,” to quote Chris Milk’s famous claim (Milk 2017, Fisher 2017, Sanchez Laws 2020, Bollmer 2017, Pinotti 2021, Morriet 2021), as it grants the possibility of putting the audience directly into the event and therefore of eliciting a transformative experience. By dissolving the boundaries of the frame, we would potentially be able to make real contact with the spectacle instead of objectifying it, by breaking what Alejandro González Iñárritu has called the “dictatorship of the frame” (Iñárritu 2017). In fact, in presenting his first virtual reality production at the Cannes Film Festival in 2017, the Mexican director emphasized how the two-dimensional format of the cinema screen hinders the spectator’s engagement with the narrated events, whereas immersive technology can instead overcome this limitation: thanks to the dissolving of the frame boundaries, we would be able to undo the detachment that traditionally separated spectator and spectacle. This line of argumentation accords with the inspiration behind the work of Nonny de la Peña, a pioneer of immersive journalism, whose ambition was precisely to bring the audience “on scene,” thus inaugurating an affective and visceral experience, to be lived *in first person*. However, the emphasis on first-person narratives in virtual reality also permeates other fields in which immersive technologies are notably employed, such as video games and pornography, mainly featuring point-of-view perspectives and focusing on a strong sense of embodiment provided by the new medium.

Such an understanding of virtual reality has decisive consequences on the way we can think of our embodied experience of immersive environments: as media scholar Melanie Chan points out, since the appearance in the 1980s and 1990s of media representations of virtual reality, specific to the imaginary and visual culture of the end of the twentieth century, “virtual reality was often represented as a wondrous technology that could provide an opportunity to *transcend the limitations of physical embodiment*” (Chan 2015, 1). The growing interactive



Figure 1: A still from Joe Hunting's *We Met in Virtual Reality*, 2021, HBO.

community inhabiting VRChat worlds (Fig. 1) and the still uncertain future of the so-called Metaverse and the epistemic, imaginary and technological construction of its advent by Meta's communication strategy, are underpinned and rely precisely upon this assumption.

Virtual reality is presented not only as providing an extremely immediate and enthralling experience of simulated worlds, i.e., allowing participants to come into contact with the spectacle instead of objectifying it, but also as an opportunity to immerse oneself in the perceptual experience and point of view of other individuals. As a matter of fact, in the last few years, a vast part of virtual reality contents realized (ranging from immersive journalism and fictional experiences up to therapeutic and prosocial applications) seem to engage precisely with the possibility of *inhabiting a different body*—be it human or non-human—and thereby having access to an extracorporeal experience, without leaving one's own body. But when one enters virtual reality, what body will one inhabit (and this, regardless of the visible presence of an avatar body)? What is it like to live from within another embodied perception? What are the aesthetic strategies that make possible an actual embodiment of someone else's corporeal experience? Do such attempts lead to failure, or can they succeed in providing the feeling of inhabiting the body of another person?

Nonetheless, the attempt to access subjectivity through media, i.e., to mediate an internal point of view is not new in the history of media

and devices (Reinerth and Thon 2016). The idea of sharing someone else's vision, not just in the form of a visual document, but of coinciding with the very movement of their gaze, is deeply rooted in the history of the moving image. Therefore, by following this objective, virtual reality pursues a cinematic drive, a desire that emerges very early in the history of cinema, namely the will to embody the perception of the other, to see what the other sees. The cinematic apparatus elaborated an effective means to let the spectator embody the view of another: the so-called point-of-view shot, or subjective shot (Branigan 1975 and 1984) emerged in early cinema, contributing to the elaboration of film experience and spectatorship (Dagrada 2014, Gaudreault 1988, Casetti 1997). Measuring themselves with such a cinematic form, the beholder is called to occupy a utopian position, standing at the same time as both an intradiegetic character and the device that enables the production of moving images. This aesthetic form most thoroughly expresses this striving to see what the other sees which became embedded in the cinematic medium. The early debate that developed between the 1920s and the 1940s around the visual construct of the point-of-view shot was already very much concerned with the epistemological possibility of externalizing vision as lived from the inside (Münsterberg 1916, Merleau-Ponty 1945a and 1945b, Mitry 1965, Wall-Romana 2012), namely of visualizing one's own inner perception, especially as regards altered bodily states (such as vertigo, vision loss, or drunkenness).

Both the point-of-view shot and its post-cinematic evolution, the first-person shot (Eugeni 2012), have been the object of an extensive study in cinema history and theory, having been mostly investigated in connection with narrative and semiotic theories, as a cinematic adaptation of literary first person (Jost 1987 and 2004, Jost and Gaudreault 1999). But, if we understand first-person perspective following a phenomenological approach, the operation realized by the cinematic POV also attempts to provide us with a prosthetic or augmented body. Drawing on this theoretical perspective, film itself has been understood as a "viewing subject," able to make the perceptual experience of its own body available to the audience. Cinema has been understood as a medium that endows the spectator with a virtual body, the body of the film as a "viewing-viewed" subject (Sobchack 1991).

But should we then understand virtual reality as an evolution of the cinematic point-of-view shot (Bédard 2019) and the postcinematic

first-person shot, which Ruggero Eugeni has defined as the “symbolic form” of our time (Eugeni 2015), as manifested nowadays by the proliferation of first-person media? Is it within the framework of this aesthetic and narrative figure that we should understand the experience of VR technologies and access to virtual worlds?

2. Augmented Virtuality: The *Hic* of Virtual Environments

Extended realities and especially the environments we can experience through virtual reality technologies have come to challenge our classic conception of images as being separated from the material world by the boundaries of the frame (Pinotti 2021, Conte 2020)—be it an architectural, pictorial or simply imaginary limit—and as traditionally having a referential or transitive structure (Marin 2001), i.e., as referring to an extra-iconic dimension (Husserl 2006). For these reasons, virtual images are no longer to be understood as “icons,” they should rather be called “an-icons” (Pinotti 2021), that is to say, images that tend to “negate” their status of representations and rather present themselves to their experiencers as environments, as worlds in their own right.

As a result of these features, the simulated environments made accessible by virtual reality technologies are often described as giving access to an *alternative* world, that is, as a parallel dimension which excludes or at least temporarily conceals our contact with the physical world, experienced in real life (IRL), as if we were given access to a hermetically sealed *trompe l’œil* (Grau 2004). In fact, ever since its designation—the trope of “virtual reality” coined by Jaron Lanier during the 1960s—the virtual medium bears a problematic relationship to the “real”: the very definition of virtual reality seems to imply a virtual dimension that is meant or believed to—even though temporarily—be “as if” real, in other words, as a virtual real as opposed to a “real” real.

In fact, nothing could be more misleading in describing the user experience of the virtual environment: instead of “leaving out” the real world, VR technologies rather inaugurate a porosity between different coexisting sensorial dimensions, producing a blurring of the threshold

between the world of the image and the physical or material world. Being immersed in a simulated audio-visual environment, in some cases complemented by multisensory stimuli, while inhabiting a material space with our bodies and even being allowed to physically move within it, constantly requires us to blend our simultaneous perception of multiple overlapping realities.

Hence, we need to reverse the assumption that the virtual is what comes to *augment* the real, to extend it or rather to replace the real with *another reality*, for what actually occurs in the immersive environment is also that the virtual space is simultaneously *augmented* by the real. Therefore, the relationship between the virtual world and the “real” or physical space occupied by the user must be reframed as a two-way communication.

Indeed, even from a technical point of view, the relationship between physical space and the construction of the plausibility of the virtual environment has been discussed, since the 1990s, as a *reality-virtuality continuum* (Fig. 2). In this regard, Paul Milgram et al. introduced the concept of “augmented virtuality” (Milgram et al. 1995, Skarbez et al. 2021), referring to environments created entirely in computer-generated imagery (CGI), to which elements of “reality” need to be included and objects present in the physical environment must be introduced into the graphic world, such as the user’s hands, which appear in the form of a partial avatar in order to point, grasp, or manipulate something in the virtual environment. But, in fact, the expression “augmented virtuality” could be applied to immersive VR experience as such, inasmuch as it always features a constant two-way passage between elements of the real and the virtual.

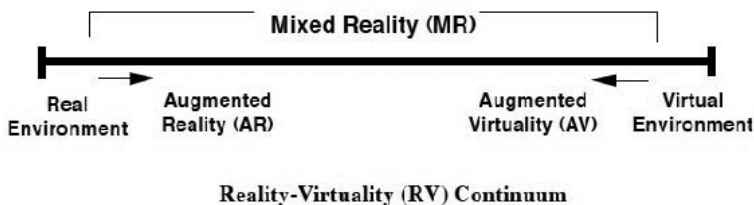


Figure 2: Milgram, et al. 1995.

Only in this way is it possible to understand the specific embodied conditions that regulate what media studies call presence or telepresence, i.e., the feeling of being part of the simulated environment and also of being able to move within the virtual space. The visualization and tracking systems of immersive headsets, in fact, generate sensorimotor contingencies sufficiently congruent with those of physical reality (Slater 2009) to be able to deceive the human brain and to create the illusion of sharing the same space (the phenomenon defined as *place illusion* previously referred to) and, under certain plausibility conditions, to provoke responses similar to those that the physical environment would elicit. It is worth noting that this applies regardless of the degree of verisimilitude and photorealistic appearance of the virtual image (Salen and Zimmerman 2003), which can be realised by means of 360-degree video shooting, photogrammetry, volumetric capture or entirely processed by means of computer-generated imagery (CGI).

If this translation or transduction between the two dimensions becomes possible, it is not because our brain would “substitute” one set of stimuli (the ones coming from the physical reality) for another one (coming instead from the virtual image). The possibility that I could be fooled into taking the simulated environment for real is a hyperbolic metaphor (J. Murray 2020), forged by science fiction narratives and sometimes leveraged on by marketing and communication professionals, as the fact of wearing a head-mounted display keeps reminding me of the operation of mediation that is ongoing.

But, instead of being fooled by the verisimilitude of virtual worlds, what is far more impressive for those who have experienced VR technologies is the fact that any immersant is subject to place illusion *in spite of the fact* that they are perfectly aware of the simulated nature of the stimuli they are receiving from the virtual world, and yet they cannot help being perceptively involved, in some cases in an uncontrollable manner. Indeed, I—along with my brain-body system—never abandon the perception or at least the awareness of being situated in a certain place, inside a room or any physical space, while I simultaneously produce bodily responses to the stimuli that originate from—what I know to be—a simulated reality. In this context, the body is constantly called to merge together different dimensions of experience, hence the fatigue and sensation of motion sickness that are frequent especially in VR beginners.

In fact, this process of innervation or hybridization of our body with the aesthetic functions of a device is by no means new in the history of media technologies. We can try to compare the situation described here to a multisensory experience that is much more familiar to us and which has long since innervated our media experience: that of audio-visual media. In a similar way as the *Flatlandia* mental experiment served the purpose of understanding the fourth dimension, let us try to compare the simultaneous stimulation of the soundtrack and the visual track of film to the experience of virtual environments. In a movie, the sound design that constitutes the soundtrack is a constructed reality that has nothing to do with the sounds we experience in our everyday life. It is the product of foley artists and later of post-production sound effects designers; even when it comes from live sound capture it still differs from our ordinary perception of sound. Consider the fact that even the lack of noise in a film is conveyed with the recording of so-called room tone or room sound, that is the “silence” recorded at a location or space when no dialogue is spoken, whereas the complete absence of sound results in an uncanny feeling, generally used to arouse suspense and fear in the audience. Nevertheless, as cinema spectators, we have become accustomed to merge what we see on screen with this independent dimension of complex stimuli, made up of human voice, music, and noises, as well as to accept that they do not adhere to the visual phenomena appearing on screen but could be external to diegesis (as in the case of extra-diegetic music) and can even point to an imaginary or spiritual dimension (the voice of an absent omniscient narrator or character voice over).

Similarly, in the context of a simulated virtual environment, the immersant is engaged in a process of constant negotiation between two overlapping “tracks” of stimuli: the ones coming from the physical environment and those that are generated by the virtual environment. Not surprisingly, some of the most cutting-edge VR experiences realized increasingly combine the virtual environment with the setting of material props that come to effectively support the merging of the overlapping dimensions, so that the virtual incorporates the real and the real comes to include a virtual dimension.

3. Being Present: The *Nunc* of Virtual Environments

How does the feeling of being included in the simulated environment affect the aesthetic experience of those who immerse themselves in virtual realities? *Place illusion* in itself is not sufficient to motivate the engagement, the effect of participation or even the emergence of an empathic response conveyed by virtual environments—as is suggested by the dominant discourse with which virtual reality contents are often promoted. Let us try to further analyze the material and phenomenological conditions of VR experience, to attempt to observe its effects on the way we experience the reality of the virtual image.

In fact, since the impression of “being present” in the virtual environment is widely investigated as a key feature of the medium, the emphasis is often placed on the capacity of VR to recreate a world spatially surrounding the audience, by building 360-degree explorable landscapes, 3D objects, avatars, and so on. Yet, there is another meaning of “presentness” that is rarely highlighted when examining VR media technologies which concerns the specific temporality entailed by the experience of virtual environments.

We can compare virtual reality with photographic media, which have been at the center of aesthetic and mediological reflection in the twentieth century. Simplifying to the extreme the bases of film theory and semiotics of media, we can say that what is considered to be the distinctive trait of the photographic image, according to the reflection first developed by André Bazin or Roland Barthes, is the fact of presenting us with its referent by placing us before the evidence of its “having been” (Barthes 1981), that is, before something that has been absolutely and irrefutably present, but which we always necessarily encounter in a delayed manner, as a “mummy of change” (Bazin 1959). In this perspective, what characterizes the aesthetic reception of photography and cinema is the impact with a *temporally delayed reality*, which opposes to the dimension of the present, characteristic of the expressive form of theatre, which, as György Lukács wrote in his *Reflections for an Aesthetics of Cinema*, is an “absolute present” (Lukács 1913): a present that is not the mere present of life, but in which the audience is brought to abandon the parameters of everyday life in order to embrace a different system of rules.

Virtual reality technologies, precisely by virtue of the embodied conditions described above, project their audience into a similar “abso-

lute present.” Before connecting us with a re-presented real from which it originated, the image that surrounds us at 360 degrees puts us in contact with a reality which *is taking place*, which is currently unfolding, and which, indeed, as we shall further emphasize, co-constitutes itself as a result of our bodily movements (Fuchs 2017). In such a context, instead of a “real” that reaches us from its factual, historical, or memorial dimension, we are rather confronted with a real which is constantly actualizing, a real which sensorially envelops us and which we cannot escape in its being shaped in real time.

In other words, the unfolding and the occurrence of the merging of the virtual environment, together with the embodied dimension we experience in VR, tends to overcome the reference—although always potentially present—to an indexical or even documentary dimension of what is presented to us. Hence, the VR audience experience needs to be reframed as radically pertaining to a performative dimension, to the detriment of any representational component and reference to an extra-iconic dimension: we are no longer confronted with an image *of* something, but with a world that imposes itself as such in its presence (Pinotti 2021, XV). In this sense, the image—even when photorealistic or manifestly the result of a photographic capture in non-fiction contents—seems to be partially devoid of the factual force of a referential past, since the dimension of its actual unfolding prevails—overwhelmingly—over its possible emanation from a referent. In a nutshell, we could say that we experience virtual environments *in the present tense*, and that the real with which we come into contact is located in the excess of our embodied response, in the bodily feedback that ensures the editing of the immersive experience, occurring even independently of our rational and conscious processes.

If virtual reality is to be experienced in the present tense, it is because it puts us in contact with a real which needs to be actualized and “brought about”. In this perspective, the immersive environment has been understood as the site of a *re-enactment* performance. As Luca Acquarelli has suggested, this often concerns the production process of VR contents, as much as the moment of their reception, in which the audience becomes the protagonist of the unfolding of narration or experience (Acquarelli 2020). In fact, one of the recording techniques utilized for the creation of immersive contents entails the use of motion capture technologies, in which actors or even the real protagonists of historical

events or individual stories are asked to stage their own involvement in the narrated facts. But re-enactment is also what occurs when the trace of human gestures and their memory are reactivated by the immersants engaged with the virtual environment, in a computational AI-assisted recomposing of the point of view that re-articulates the bodily movements captured in a preliminary phase.

Such strategies draw on and take from various forms of historical re-enactment as well as the long-standing tradition of re-enactment as an artistic practice (Baldacci, Nicastro and Sforzini 2022). In this respect, discussing the multiple applications of virtual reality technologies in archaeology and museum projects (Gaitatzes et al. 2001), Elisabetta Modena has pointed out that several contents aiming at visualizing heritage sites or even reconstructing buildings and works that have disappeared, are based on the practice of re-enactment to revive the past and collective memory, setting out a sort of *narrative anastylaxis* (Modena 2022, 95–98), in which the process of digital recomposing is not limited to the reconstruction of environments and buildings, but also includes their animation with stories, rituals and daily practices.

There is also a distinctive kind of re-enactment, which not only implies a performative revival unfolding before the eyes of those experiencing the immersive environment, but also a re-enactment of one's own perception, that is the possibility of recreating a first-person experience. Indeed, as noted above, the experience of virtual reality is often understood as the possibility of stepping into the other person's shoes, that is, of assuming their situated point of view and individual perspective. This is a peculiar variant of the immersive experience that implies being brought to coincide with a precise point of view, realizing what Andrea Pinotti has called a "360-degree autopsy," in the etymological sense of "*autòs optòs*," "to see with one's own eyes" (Pinotti 2019, 29–30). At the same time, this capture of a subjective point of view is also an autopsy in the mortuary sense of the term, in that it freezes the reality it immortalizes in its mere perceptual and factual reception in order to offer it, in its absence, to another person for inspection. It is worth noting that, even though in these cases the genesis of the virtual image implies a re-presentation, i.e., a repetition of experience as suggested by the very concept of re-enactment (Holzhey and Wedemeyer 2019, Tore and Colas-Blaise 2021), for the immersant embodying virtual environments, the reality unfolding during the experience will

still be experienced as happening and unfolding in the present, rather than in the form of a past being evoked or reproduced. Thus, as these different interpretations suggest—in a different but compatible manner by referring to the notions of re-enactment, anastylosis or autopsy—in the sensible encounter with immersive worlds we come into contact with a real that rather than reaching us from the past, demands to be activated, as well as built, informed, and constructed *in the present* by the immersant who experiences it.

These preliminary investigations, trying to single out the *bic et nunc*, the here and now, of immersive experience, have hopefully prepared the ground for a phenomenological discussion of the experience of 360-degree virtual environments. In the following, we will focus on an analysis of the gaze, to be understood not merely as the product of ocular vision, but more broadly as the situated embodied point of view that is the pivot of the perceptual articulation of the virtual environment. This will allow us to interrogate the ways in which the immersants are led to situate themselves in relation to this unfolding real and thereby to question their own inclusion in and participation in the virtual world.

Focusing on the embodied gaze will also allow us to investigate embodied experience in virtual reality regardless of the virtual visible presence of a full or partial avatar body, which have attracted much attention in recent accounts of virtual immersive experience (Murray and Sixsmith 1999, Murray 2000, Dolezal 2009, Popat 2016, D’Aloia 2018, Zimanyi and Ben Ayoun 2019).

4. The Body as Virtual Frame: The Performativity of the Immersive Image

In order to understand the access to virtual immersive environments as an embodied experience from a phenomenological perspective, we can now resume our initial hypothesis: if VR provides a view in first-person, should it be understood as an evolution of the point-of-view shot, part of the multiplicity of contemporary first-person media and genres?

Of course, the specificity of VR lies in its being “subjective” (Bédard 2019), in the sense that the body of the immersant is the point that

generates the constitution of the image in a process of performative negotiation: for instance, what appears within the environment is the result of the synthetic graphic elaboration or, in the case of 360-degree cinema, the pre-rendered recording of the environment, *and* at the same time of the physical and attentional movement of the embodied gaze that wanders within it. To put this in another way, the specific mode of presence that is articulated by virtual environments can be interpreted as generating a “self-centered world” (Eugeni and Catricalà 2020), as, in semiotic terms, the experiencer is granted a role of co-enunciator of the virtual world. But, in what sense is virtual reality experienced as self-centered?

In this respect, virtual reality has brought about an epistemological shift in the conception of spectatorship, similar to that which was affected in the history of cinema by the introduction of depth of field and long take, which provoked a radical reassessment of the spectator’s role. These aesthetic constructs and visual strategies obliged theorists to think of the spectator’s experience not just as an essentially passive reception, but as being constantly involved in an attribution of meaning and progressive readjustment of this, in which the interplay between the belief in the world represented and the reflection on such a reality result in the “active” participation of the beholder (Bazin 1959, Dufrenne 1981, Buscemi 2022).

Thus, if an analysis of the new status of spectatorship inaugurated by VR technologies often focuses mainly on the spectator’s sensorimotor interaction, playfulness and transmedia agency (Neumann et al. 2018, Cowan and Ketron 2019) paradoxically, the operability and performativity of the embodied gaze are still largely overlooked. In fact, the interactivity proper to immersive environments cannot be limited to the fact that the experiencer is now able to move, respond, and direct their actions towards certain goals within a virtual space, but also brings into play the gesture of looking—as well as being/not being seen—along with new forms of voyeurism and narcissism of vision (Wang 2021).

In view of phenomenology and especially of Merleau-Ponty’s account of embodied experience (Merleau-Ponty 1945, 244 and 2011), perception has to be reframed as an active exercise, as a form of expression: perceiving is never purely passive reception, but already a way of *acting*, since it always entails the movement of the body—even when we are immobile, the gesture of looking implies ocular and muscular

movements—and, in other words, since our perception, by expressing the world, recreates it. Also, according to the enactive approach drawing on phenomenology and cognitive science, “perception is not something that happens to us, or in us. It is something we do,” since the world makes itself available to the perceiver through bodily movement (Noë 2004, 1).

Therefore, even though virtual environments can provide dramatically different degrees of freedom of movement, according to their production process and the conditions of the interface (allowing different so-called degrees of freedom, 3DOF or 6DOF), the experienter’s interactivity cannot be limited to their capacity to explore or manipulate the environment and the objects included within it. In other words, the line of discontinuity which marks VR spectatorship and differentiates it from other forms of media experience cannot coincide simply with the measure of user interactivity, which is necessarily a gradient. On the contrary, I suggest that we acknowledge that the embodied encounter with the virtual image always entails, as its *minimal but intrinsic form of interactivity*, a *shared performativity*, in which a reciprocity is established between, on the one hand, the gestures of inspection and multisensory exploration of the environment and, on the other hand, the very unfolding of the visual, audio-visual or multisensory material experienced.

In fact, a process of negotiation between the experienter and the work’s perceptible material characterizes the aesthetic experience and media spectatorship as such, and yet, the interface of virtual reality confronts us with *an image that co-constitutes itself in accordance with the embodied movement of its experienter*, as the tri-dimensional environment relies precisely on the immersant’s mobility to unfold. Even in cases where the interface or immersive storytelling does not entail more complex forms of interactivity, virtual reality technology always involves the experienter in the process of the *real-time construction of the image*. Thus, if within virtual environments we come into contact with a real-in-image, it is a real that the experienter contributes to in-forming or at least, as affirmed above, to actualizing or re-actualizing in the present.

Thus, as much as immersive media seemingly inaugurate an experience of unframedness, as a new condition for the perception of the image, opposed to the classic conception investigated in the history of

art and media, the process of in-formation of the image traditionally ensured by framing in 2D media, does not completely dissolve. On the one hand, framing persists as a symbolic, psychic, aesthetic, or semiotic threshold (Pinotti 2021). But, more radically, I would claim that, instead of disappearing, the very perceptual function of framing is assumed by the experienter's body, by the performance of their bodily gestures and embodied gaze. Indeed, even in 360-degree films which do not allow an interactive exploration of the environment, the experienter can direct and point their gaze inside the tri-dimensional surrounding, adopting different patterns of visual behavior, tracing with their eyes what in film analysis would result in panoramic shots, tracking shots, changes of perspective, and so on. As a result, being constantly tracked by the sensors of the interface, the body of the experienter acts like a *virtual frame* (Dalmasso 2019a), so ensuring the functions of selection, comparison, association, and dissociation, hitherto described—in film and media theory—as framing, camera movements and editing. This needs to be understood not merely in physiological terms, but in its social and biopolitical implications: as the body of the immersant is historically situated, it brings along a background determined by socio-cultural conditions and norms, gender, ethnicity, and so on, acting as well as a receptacle for their performative response to the image.

However, it is worth noting that the performativity of the experienter is just the reverse of the performativity of the image itself, as operational (Hoel 2018) and “perceiving” image. This co-constitution of the virtual image is possible as head-mounted displays are equipped with sensors which constantly track the user's movements and reconstruct their position in space in real time, so that the resulting image that appears on the screen—which, although not experienced as a two-dimensional surface, is nevertheless in front of the user's eyes—continually modifies in accordance with bodily movements. Hence, by virtue of this reciprocity, the performativity of the virtual image describes a structure in which we can no longer assign categories of activity or passivity to one of the two involved, that is, the image and its experienter, since, to take on Merleau-Ponty's expression, they are always in an “imminent reversibility” (Merleau-Ponty 1961).

5. Whose Body? Becoming a “Moving Cast”

But, if this configuration structurally concerns the conditions of use offered, by design, by the virtual interface (at least in the form that this technology has taken in its current stage of development), how does the shared performativity of the virtual image come to reshape the experience of embodiment in immersive environments? Our analysis could now be deepened through an investigation of forms of embodiments that can be elicited by the different interaction designs implemented in contemporary VR productions. Our goal here is not to outline a comprehensive taxonomy (Dalmasso 2019b), but to better discuss how the assumption of the framing function by the immersant’s body and to single out the aesthetic strategies that can emerge from this feature of the virtual medium, stimulating the audience to cognitively and bodily situate themselves in relation to the unfolding real, potentially bringing them to question their own participation and inclusion in the virtual world.

We will focus our analysis on a few examples from one of the genres most explored in contemporary immersive productions, namely so-called immersive journalism or, more in general, non-fiction VR contents. The examples we will analyze share, in different ways, the intention to thematize and raise awareness of the experience of migration, often focusing in particular on the currently topical moment of the crossing of the border.

If we consider some of the early pioneering works of immersive journalism,² we can observe that the vantage point that is offered to those who experience the virtual environment proposes a sort of degree zero of observation, aiming to achieve a complete illusion of non-mediation—which is the very definition of presence effect: as if I were there. When understood in this sense, virtual reality would seem to realize the dream of idealist philosophers of being able to transcend the existence of our material body so as to achieve a pure inner vision, a pure act of perception experienced from within. However, such productions tend not to forego institutional enunciative indexes proper to

² See, for instance, ground-breaking works like *Clouds Over Sidra* by Chris Milk and Gabo Arora (2015), *The Displaced* by Ben C. Solomon and Imraan Ismail (2015), or Nonny de la Peña’s *Gone Gitmo* (2007), *Hunger in Los Angeles* (2012), *Use of Force* (2013).

traditional documentary film-making. Hence, the audience immersing in the virtual work, although locating themselves within the diegetic space, still maintain their privileged space of external witness (Nicolae 2018; Nash 2018).

More recently, also by leveraging on the expressive research carried out by the early productions of immersive journalism, many works of non-fiction VR have begun to call into question the conditions under which we experience virtual environments, through their storytelling strategies. The interaction design they implement essentially lean on the performative dimension of the virtual image previously examined, and attempt to articulate expressive choices that effectively exploit the spectator's inclusion in the spectacle.

Realized by means of 360-degree filming and CGI effects, Stefania Casini's *Mare Nostrum – The Nightmare* (2019), follows the journey of a young migrant boy from the Sahara to the Mediterranean Sea. Stepping into the virtual environment, at first the audience witnesses the tragic farewell between the young Tuareg Atambo and his mother, as he is about to leave his native land. At first, this closeness would appear to be an intrusion, we feel uncomfortable as we are intruding into an intimate situation, until an unexpected interpellation occurs: the mother turns towards the immersant, she addresses *us* and asks *us* to protect her son. Our excessive proximity, thus, assumes a specific meaning on a narrative level: we are invited to position ourselves in relation to the image that surrounds us. However, the interpellation upon which immersive storytelling here relies is not simply linear, in other words, the question addressed to us is not univocal. In fact, on the one hand, it invites the immersant to ask the question: what role should I inhabit if I place myself within the diegetic universe? Am I one of the smugglers who manage migration routes from Sub-Saharan Africa, or, am I a friend, a travelling companion who will share the border crossing with the boy? In fact, as I will claim, at a closer look, the kind of conundrum that is posed to the immersant is articulated by every VR experience. Yet, here, the question raised by the mother does not merely call for a diegetic interactivity, it reaches us also on another level, as the question she poses also hints at the outside of the fictional universe: is it perhaps I myself—with my first-world citizenship status—to whom the mother addresses a symbolic appeal?

These different diegetic and non-diegetic instances are gathered in my point of observation, when, instead of voyeuristically witnessing this journey, I am immediately called upon to situate myself—both aesthetically and ethically—within this world. Later in the development of the VR script, my position will be repeatedly called into question: in a Libyan prison I will be one of many prisoners, I will become a companion in the trip by sea, and so on, following step by step Atambo's destiny.

The essential but effective narrative choice put into practice by *Mare Nostrum* reveals that, even when in a 360-degree experience we are devoid of a sensible corporeal appearance within the virtual world and cannot therefore be identified in a visible avatar, we still can feel visible, addressed, and subject to observation.

A similar but more intensive use of interpellation is put in play by Neil Bell's interactive installation *The Crossing* (2022). The immersant witnesses a clandestine night-time rendezvous on the Libyan coast, where a smuggler meets a group of migrants preparing to embark on their journey. The smuggler must decide who, among the migrants, will act as the captain of the rubber dinghy. Some put themselves forward for the role, but suddenly the smuggler turns to us and lets us choose the person who seems to be best suited to captain the boat, knowing that the responsibility for the consequences of this decision will ultimately fall on us. The virtual experience thus unfolds, along the lines of a serious game, confronting us with decisions to be made during the trip and their crucial outcome, which will result from our choices.

An opposite aesthetic strategy is pursued by what has undoubtedly become the most famous virtual reality work to deal with the subject of migration: Iñarritu's *Carne y Arena*, already mentioned above. Here, plunging into the Sonora desert, where a group of South American migrants are crossing the border between Mexico and the United States, the immersant is not visible to the other characters, being, as the subtitle of the experience suggests "virtually present" but "physically invisible." This ambiguous dual status confronts us with the frustration of not being perceived by the characters we encounter who ignore us and pass through us, thus attributing to us a ghostly existence. Such bodily invisibility points towards the political and social invisibility of the migrants' bodies, of which the immersant can thus have a glimpse. Through the complex installation that is the framework of the piece,

those who experience the virtual environment are thus called upon to embody a first-person perspective—stepping into the shoes of a migrant—and yet, such a process of alteration depends upon their freedom of movement and choice, in such a way that it may or may not result in an overlap and coincidence, for instance, with the refugees caught in the night or, perhaps, also with the border patrol agents.

In different ways, in the encounter with these VR works, we are invited to undertake the gesture of a continuous “gearing” onto the visual and sensible material, to situate ourselves in relation to a reality that touches us precisely insofar as it questions our being located in a perceiving-perceived body.

This process of embodied situation also implies positioning oneself within a complex visual culture, which loads the perceptible image that surrounds us with cross-references and stratifications of meaning. It is at this network of markedly extradiegetic echoes and references that Sara Tirelli’s *Medusa* (2018) hints (Pirandello and Tirelli 2021). From its very title, the 360-degree experience establishes a direct association with one of the most crucial myths in the history of images—the Gorgon capable of petrifying with her gaze—and at the same time locates its vanishing point in the event of the shipwreck to which Géricault’s famous work of the same title refers. *Medusa* moves away from the narrative grammar of immersive journalism to place the immersant at the heart of a theatrical and cinematic performance which envelops them, bringing together events and elements that permeate humanitarian visual culture, up to a symbolic re-enactment of the shipwreck of the Medusa. Through virtual storytelling, those who experience the immersive work realize little by little that the place they occupy—as privileged Western citizens with European or Schengen passports—is that of the spectator of the shipwreck which from Lucretius’ *De rerum natura* onwards characterizes our relationship to the spectacle and that the artistic exploration of the virtual medium dramatically puts into question today.

The stylistic trait that characterizes the four works we briefly examined calls upon the immersants to situate themselves in relation to the diegetic world, that is to “mold” their bodily presence and consequently their identity within the immersive environment, resulting in a corporeal and spatio-temporal, but at the same time also social and political positioning. This dynamic seems to emerge as an absolute expressive

and aesthetic specificity of the virtual technology that is still taking shape as an expressive medium, namely, the possibility of interrogating the process of “gearing” between virtual and real. This is the point in which the performativity or shared agency of the immersant and the virtual image meet: with my simple bodily movement in space, I have the power to shape the tri-dimensional image that appears to me, but this image that is molded around my “moving cast,” has, in turn, the power to fashion me as a perceiving body included within the perceptible—at the same time real and virtual—world.

To employ the terms used above, while discussing the advent of a virtual reality to be re-enacted or re-constructed, we can say that the virtual *anastylosis* does not concern only the perceivable material within the immersive environment, but first and foremost the position of the subject experiencing it. As mentioned above, not only do the immersants contribute to constituting the virtual image, but they are in turn shaped by the immersive environment, asked to fashion their own identity, adapting themselves to the unfolding of the experience in order for it to take place.

Indeed, regardless of the genre and media context from which the VR content springs, the game space (*Spielraum*) of any 360-degree experience systematically organizes as an enigma, a conundrum—and this regardless of the presence of a specifically playful component and the degree of interaction and manipulation of the environment granted by the interface—in which the immersant is invited to *figure out their own position within the spectacle*. In fact, every VR experience places us inside a puzzle or rebus whose constant question is: who am I? Who am I supposed or meant to be? What degree of engagement and participation is required of me? What kind of identity should I adopt so that the experience could work and make sense? Even when in the absence of an interactive engagement, in virtual environments I need to keep questioning my role as a mobile virtual frame, attempting to adapt my bodily gestures to the perceptible image that I contribute to informing around me, in which the “real” takes shape as that which makes me re-emerge from the image as a subjective position, to be continuously reconstructed around the gaze that I am invited to embody.

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