Contemporary aesthetic perspectives on imagination and reality media

Lorenzo Manera[*]

ABSTRACT

The growing and ubiquitous presence of 'digital reality media', meaning technological devices that do not rely either on inner visualization or imagination – such as Augmented and Virtual Reality devices and 360° video (Engberg & Bolter 2020) – raises several issues. Such issues are related to the role played by the imaginative faculties both within emerging visual-motor and perceptive configurations and within the transformative process of remediation instantiated by the virtualization of reality. This contribution aims firstly to discuss the concepts of second-order media and reality media (Bolter, Engberg & MacIntyre 2021) by linking them to Pinotti's concept of an-iconology (Pinotti 2021). By drawing on Tavinor's digital aesthetics (Tavinor 2022), this contribution argues that the an-iconic condition of VR media might be better intended as a desirable outcome in current research, rather than a condition already achieved.

In order to discuss whether the imaginative aspects and those that define the use of digital devices are characterized by an interactive statute, this contribution addresses Montani's notion of 'intermedial imagination' (Montani 2022) and Flusser's concept of *Technoimagination* (Flusser 2008). Thirdly, this paper discusses how the interactive concept of imagination – suggested by the re-definition of the relationship between distance and materiality, provenance and pertinence – is displayed differently in VR and AR. Finally, the contribution faces the topic of the fallout that the most recent technological development (in terms of reality media), such as BCI (brain computer interface), might have on human imaginative faculties.

KEYWORDS

Reality media, Digital aesthetics, Intermedial imagination, Virtual reality, Augmented reality.

1. *Second-order Media, Reality Media and Imagination*

Discussing the concept of 'Reality media', Engberg and Bolter recently defined it as a class of audiovisual technologies, including 360° video, Virtual and Augmented Reality, that "do not rely on imagination and inner visualization of worlds presented via text, but instead assert their physical presence in the world we inhabit"

[*] Università degli studi di Modena e Reggio Emilia, lorenzo.manera@unimore.it

(Engberg & Bolter 2020, p. 86). According to the authors, *second-order media* represent reality symbolically, calling up a world by way of our imagination, while *reality media* re-define it by soliciting our senses through the production of perceptual layers that make us compare new representations with our previous experiences of the world.

By further deepening this conceptual categorization, on the one hand, Engberg and Bolter state that Virtual Reality (VR) can be considered an *expansive* or *unified* reality medium, since it appeals to several senses and requires stepping into a whole fashioned reality. On the other hand, Augmented Reality (AR) can be defined as a *hybrid* reality medium, since it integrates digital information within the world that we normally perceive.[1]

Compared to older reality media such as television and cinema, which function independently from the viewers' point of view, VR and AR differ inasmuch as they are characterized by a ceding of control. The camera is governed not by the producers, but by the users. Furthermore, these reality media sense the users' movements in space and their positions, defining the actions of tacking and sensing as integral aspects of their functioning.

According to Bolter, Engberg and MacIntyre (2021), the key aesthetic difference that differentiates the abovementioned *reality media* can be detected in several aspects. Firstly, the isolation effect that characterizes VR, as the device defines everything that the user sees and experiences, replaces our world with another. The latter, on the other hand, keeps the user situated in the world, only partially overlaying the physical world.

Secondly, by combining the data related both to the detection of surfaces and to the identification of objects in space with data deriving from the motion of the headset, computer vision algorithms are now able to organize objects into a scene. Such an aspect allows AR devices to provide a deeper sense of connection between the virtual and the physical worlds. If the immersive characteristic of VR aims to create a fictional reality that resents the complexity of the actual environment, mixed reality and AR aim to produce an effect on the latter, by seamlessly integrating virtual and iconic aspects with real ones.

Thirdly, VR tends to extend our senses by providing the users with a view of another world, carrying them away from an actual environment. Furthermore, it transforms distance in close presence, constituting a representation in its own right, placing emphasis on

[1] These categories are intermediate points within the *virtuality continuum*, whose endpoints are virtual and real environments (Skarbez, Smith & Whitton 2021).

the aesthetics of immersivity. On the contrary, AR redefines the physical environment by combining it with parts of the digital world, as it makes 3D objects present, and by allowing the user to perceive digital data within the everyday world. Therefore, AR insists both on the quality of hybridity, on greater hapticity and the sense of proprioception[2], as it places virtual material into a physical space. The technical performances provided by AR and VR tend to delineate quite different relationships between the digital and the physical worlds. In VR, such worlds stand as alternatives to each other, while they to tend to complement each other in the former.

In our view, as we will argue in the conclusive paragraph, Augmented Reality – by proposing a presence in the physical world interactively augmented by digitally shared multimodal information – compared to Virtual Reality entails a deeper engagement of the imagination, since it fosters the possibility to connect different intermedial channels, rather than isolating ourselves from the physical world. Even though augmented and virtual reality media modulate differently the dialectic between presence and absence, nearness, and distance, they both add complex symbolic layers of meaning to our aesthetic relationship with the world (Modena, Pinotti & Pirandello 2021), an aspect that will be discussed in the next paragraph.

2. *The Rhetorical Properties of Augmented and Virtual Reality*

According to Modena, Pinotti and Pirandello (2021), compared to reality media such as paintings or videos, both VR and AR contribute to the *environmentalization* of the image and share fundamental properties of a rhetorical nature, such as *immediateness*, *presentness* and *unframedness*.

With the latter concept, the authors refer to the absence of a framing device, a peculiar iconic aspect related to the process operated by the image within the visual field, which prevents the user from focusing on what is outside the image. This process entails the loss of a characteristic that has traditionally defined the image, namely the fact of being framed. The complete saturation of the visual field allowed by head-mounted displays (HMD) entails the destitution of the hybrid status, as much as the loss of the insulating and medial function of the frame. On the other hand, by sanctioning the transition from *framedness* to *unframedness*, such reality

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[2] The authors define the involvement of multiple senses and the merging of the physical and the virtual as a *polyaesthetic* experience, which refers to the process that allows mediation to relate to the perception of the world (Bolter, Engberg & MacIntyre 2021, p. 49).

media define a condition that allows the exploration of unprecedented affordances. They suggest the occurrence of a progressive innervation of the digital devices, that act as media technologies capable of reconfiguring the perceptual horizon through effects of immediacy and transparency.

The described process calls into question the maintenance of the separation between perception and imagination, understood as image vision. In the phenomenological tradition, the character of immediacy constitutes a diriment criterion for making distinctions between intuitions and signs, an aspect that raises the issues of image perception in immersive environments (Pinotti 2021). With regards to the above-mentioned tradition, which configures the experience of the image as a mediated form of perception, the emergence of technologies that conceal – at least from a perceptual point of view – the distance between the material support and what the image represents, problematizes the preservation of a separation between the experience of perception and of the image experience. In fact, the latter is challenged by a further feature of immersive environments, related to the weakening of the distinction between image and reality, which concerns the amplification of the condition of presentness.

The digital-virtual environment works over the experience of *immersiveness*, intended as "an unframing process for views and images, that dissolves the boundaries with their environment".[3] Once the user is immersed in the virtual environment, even though the landscape is constituted exclusively by images, the multi-sensory character of VR implies a perceptual condition that crosses the threshold between reality and image, allowing subjects to be active experiencers rather than passive visual observers. Fostered by the characteristics of presentness and immediateness, VR and AR media reduce the asymptotic perceptual distance between the material reality and the virtual mediated one. The active experience of the user elicits a sense of immediacy that challenges the distinction between a medium that represents and an object that is represented. Such effect, defined *immediateness,* implies the denial on the one hand of the user's liberty to focus their gaze either on the concrete medial support or the represented object, producing on the viewer a further effect defined 'an-iconic'[4], which entails consequences in terms the denial of the medium's opacity, discussed in the next paragraph.

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[3] "Immersion ist ein Entrahmungsverfahren für Bilder und Anblicke, die zur Umgebung entgrenzt warden" (Sloterdijk 2006, p. 58).

[4] With the term 'an-icons', the author refers to pictures (*icons*) that negate their iconic status (Pinotti 2021).

3. *Hypermedial Technologies and the Non-referential Dimension of Representation*

The diffusion of hypermedia digital technologies, such as smartphones, tablets and devices for augmented reality, imply the shaping of increasingly device-mediated ways of perceiving reality, occurring through "the intermediary of prostheses of perception. This means that the condition in which our beliefs are constituted has entered a phase of intense evolution. Analogico-digital technology is a decisive moment in this evolution".[5] According to Stiegler (2002), in the history of the image-object, the appearance of the photographic analog image was followed by the appearance of the animated analog image and, in the twentieth century, the invention of the digital image, a synthesized image that models reality on the basis of a mimetic process. Finally, the last years of the twentieth century were characterized by the emergence of the analog-digital image, also referred to as the 'discrete image', because it involves a process of systematic discretization of motion.

The described process is linked to the inherent characteristic of manipulability of the digital image, a quality that, according to the author, reduces the distinction between illusion and reality. In the face of this risk, the analog-digital object image leads to the possibility of the emergence of new forms of subjective synhypothesis of the visible, which breaks the process of continuity through a process of discretization. By combining analog and digital reproducibility and discretizing the continuous, the analog-digital image creates the possibility to generate new critical accesses to the image and new forms of reflexivity in the field of the visible.

The substitution of mimetic representations that point to something else with virtual images that do not operate with an imitative function, but instead presents themselves as autonomous environments (as in the case of virtual reality), suggests the emergence of a non-referential dimension of representation. If in the referentialist paradigm the image is mimetic and points to something else, in the non-referentialist representations the image does not have an imitative function, but it is rather autonomous in itself, as in the case of immersive virtual environments, that "offer themselves as actual entities to be perceived 'in person' rather than images-of" (Pinotti 2021, p. 600). By challenging the account of the image as image-of, such a non-referential dimension poses the issue of quality-defined immediateness linked to the appearance of non-mediation and to

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[5] Stiegler (2002, p. 149).

the negation of medial opacity. The shedding of the representational and mediating markers that characterize pre-virtual images in favour of the emergence of the qualities described in the previous paragraph results in the emergence of pictures that deny – at a phenomenological level – their status as icons, and although they present themselves as if they were reality, they tend to produce an an-iconic effect on the viewer. Such an effect can be problematized by drawing on Tavinor's remarks on the aesthetics of virtual reality (2021). By analyzing VR depictive media, Tavinor poses the question of the sense in which VR media might convey a functional or structural isomorphism to the features that are associated with the natural perceptual experience (Tavinor 2021). In stereoscopic headsets, the constrained vision of the field – often limited to 100 degrees – implies that the user can visually perceive the borders of the frame of the image. In order to replicate the visual field in a naturalistic fashion, stereoscopic headsets would need to reproduce both peripheral and foveal vision within a single array, reaching a 'foveated rendering' which can disguise the border of vision through the tracking of eye movements.[6] Therefore, the an-iconic condition might be understood more as a desirable outcome in current research, rather than as a present condition.

4. *Depiction and Virtual Reality Media*

In a recent essay, Tavinor (2022) argued that in VR the depiction of a sensory environment – mainly visual and acoustic – is achieved via stereoscopic headsets that allow mimicking the natural auditory, ocular and kinesthetic experience. The stereoscopic depiction permits mimicking the acoustic spatiality of natural hearing, and thanks to the binocularity of the lenses, the depicted images are turned into visual environments. In such an environment, the kinesthetic depiction, which involves proprioception and spatial sense is simulated as well, while the depiction of the hapticity is quite limited.

By discussing the 'digitalist position' advanced by Chalmers (2017), consisting in the idea that VR users do see virtual items, rather than a screen[7], Tavinor (2022) states that the user sees only depicted objects, visible thanks to the mediation of a screen. Furthermore, in his analysis of the depictive characteristics of VR media, the author claimed that they can be understood as forms of

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[6] Caputo, A. *et al.* (2021).
[7] "In typical VR, one needs no sense of seeing a screen, and it can perhaps be argued that one does not really see the screen at all" (Chalmers 2017, p. 319).

technological advancement of previous artistic modes of perspectival depiction.[8] In fact, the use of binocularity in VR media, defined 'depictive binocularity' allows – despite the lack of focal variation – for the overlay of two perspectives, therefore attributing an apparent depth to the space. By employing depictive technologies, the described reality media make it possible for the user to experience a spatial relationship to a depicted space, therefore reconfiguring the possibilities expressed by a representational medium.

Finally, the author distinguishes forms of virtual realism from forms of virtual fictionalism. If virtual realism involves a perceptual interaction with the real world and the exploration of real environments mediated by virtual technologies, virtual fictionalism refers to forms of mediation aimed at fictional causes, where interaction involves an imaginary world. In the case of virtual fictionalism, VR media are "used as props for warranting the imagination" (Tavinor 2019, p. 154). The two modes described appear to be mixed in augmented reality, where realistic content is overlaid on a fictional and depictive layer, allowing the user to place fictional elements within the world "that may engage the imagination. If VR counts as prosthetic seeing, this clearly depends on the context of its use" (Tavinor 2019, p. 155). But rather than investigate the issue of the prosthetic characteristic, it might be argued that the engagement of the imagination refers to a precise quality of augmented reality media – meaning their interactional nature, their capacity to provide a relational experience where virtuality is integrated with the sense of the real and the organism – which is integrated with the environment. In fact, in the case of VR media, the process of 'environmentalization' of the images regards the concealment of their mediatedness, the denial of their opacity.

In this regard, in a recent essay on the topic of the aesthetic experience in virtual environments, Diodato argues that it is possible to "consider presence in virtual environments as an illusion of non-mediation (a perceptual illusion of non-mediation), and, in correlation to this, to understand non-mediation as revealing the degree of presence" (Diodato 2022, p. 6).

From an ontological point of view, Diodato identifies the features of intermediacy and virtuality as the defining characteristics of 'virtual bodies'. By becoming phenomena within an interactive dynamic, virtual body environments are simultaneously external and internal, hybrids that disclose an intermediary dimension where the ontological distinction between objects and events is eluded. Since

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[8] Such as stereoscopic picture viewers or paintings in a linear perspective.

the word 'interaction' implies an action 'between' two polarities, it is possible to argue that the experience is fully completed not when these polarities relate as self-constituted poles, but rather when they are mutually coordinated within a unitary meaning, as in the aesthetic experience. Conversely, when disclosing margins of indeterminability and a significant degree of interactivity, the virtual environment can foster the creative and imaginative features of human beings. In a virtual environment, in fact, what we conventionally call 'image' "is immediately given as such to reflection, but what happens is that perception and imagination rather mysteriously fade into one another, because the percept, faced as perceptual intention, is not properly external, it is neither in consciousness nor in the world" (Diodato 2020, p. 235).

5. *Intermedial Imagination and Processes of Remediation*

The process of oscillation between transparent immediacy and hypermediacy has recently been addressed by Montani (2022). If the former generates the illusory perception of unmediated access to reality, the latter – enacted through mechanisms that go against iconic representational configuration – reveals the opacity of media and the perceptual mechanisms produced. In Bolter and Grusin's perspective (1999), the notion of remediation refers to the representation of one medium within another, including the recognition of a physiologically pluralizing movement of media forms and represents one of the main characteristics of emerging technologies: "Each act of mediation depends on other acts of mediation. Media are continually commenting on, reproducing, and replacing each other, and this process is integral to media. Media need each other in order to function as media at all" (Bolter & Grusin 1999, p. 55). If the process of pluralization is recognized as a qualifying feature of digital technologies, it is possible to highlight the creative potential of media culture. However, Montani argues that this process of pluralization tends to emerge not on the perceptual level, since the hypermediated character of neo-technologies leads to an increase in the immediacy of the image. This process is linked, instead, to the reflexive reappropriation of the characteristic of technicality that defines medial experiences and contributes to preventing the opposite tendency, which intensifies opacity instead of removing it.

By emphasizing its processual dimension, it is possible to foster the emergence of the characteristic of intermediality that

Montani links to the imaginative faculty.[9] With the concept of intermedial imagination (*immaginazione intermediale*) – "a technique of scouting, refiguring and attesting the real world" (Montani 2022, p. XIV) – the author refers in fact to the development of skills that allow the use of imagination in a critical sense.[10] By placing different devices that constitute technological imaginary in comparison, it might be possible to develop a relationship of interlocution between different digital media. Furthermore, such a process allows for a better understanding of the specific aspects that define the process of mediation, therefore enhancing the reconfiguration of the real world while avoiding processes of unification of the multiple of the sensation. Rather than promoting an interplay between different media formats, intermedial imagination critically rearranges them by providing the possibility to develop a creative response, tackling the anaesthetic risk of passivity related to digital technologies. Therefore, this form of imagination supports the process of refiguring reality, as well as the processing of shared experience and the externalization of imaginative performance.

In order to investigate the questions regarding the perceptual, visuomotor and sensory dimensions we establish with reality, it is possible to refer to a form of imagination that Vilém Flusser defined *TechnoImagination* (Flusser 2008). In the description of the processes that characterize the age of technical imagery – which corresponds to the redefinition of experience through the use of technical agents – the Czech philosopher investigated the occurrence of a remodulation of the mechanisms of image-making. Technical images (*Technobilder*), characterized by the role that devices play in their processing and creation, differ from traditional images, which instead are based instead on the externalization of mental images and the objectification of our view of the world. Such characteristics raise the issues of the impact that technologies have on the organizational and perceptual structures that regulate our relationship with the world and of the possibility to develop forms of technical imagination (*TechnoImagination*) capable of critically focusing medial opacity. In defining the concept of *TechnoImagination*, Flusser referred to the process of constructing an external image through the perceptual organization of data, the encoding and deciphering

[9] Montani refers to the synthetic activity of imagination, intended as "the operations of going through, taking up, and combining" (2021, p. 154).

[10] In the introduction of the first edition, Montani underlined that "such an imagination might be called critical if we take into account the etymology of this term, *krinein*, which means to separate. (Montani 2010, p. XI).

of techno-images produced by an apparatus that enables the integration of visual thinking and conceptual thinking.[11]

If traditional images, visions of objects, are produced through *Imagination*, techno-images are produced through the mediation of both apparatus capable of processing data and through *Einbildungskraft* – a form of imaginative capacity more closely related to the process of externalizing the image. The term *Einbildungskraft*, expressly Kantian, refers indeed to "the conscious manipulation of perceptual categories"[12], to the ability to unify multiple pieces of information and externalize them, integrating conceptual and visual aspects, a definition that applies to process entailed by AR devices, as they 'augment' reality interactively by combining interactively multimodal information.

6. *Aesthetic Education and the Engagement of Imagination in VR, AR and BCI*

The question of the engagement of the imagination in virtual and augmented reality media refers to their capacity to intensify the perceptual praxis and the possibility to connect different inter-medial channels. If virtual reality (VR) functions on a 'meta-representative' level, allowing the subject to imaginatively explore the intersection between reality and fiction, augmented reality (AR) works on the hybridization of reality by integrating digital information within the world that we normally perceive. Furthermore, the engagement of imagination refers to the capacity of such media to allow – through the thematization of a performative structure – the elaboration of processes that constitute the antonym of compulsive virtual experiences. Posing the issue of perceptual acts that occur through the mediation of digital devices, contemporary technologies augment reality by superimposing images on it, thus problematizing both the distinction between perception and image and the role played by our imaginative faculties. Such a process has implications that involve the field of the aesthetic education, as it allows us to address the issue of the aspects that unite ordinary perceptual experience and iconic experience in the current technological context. In particular, if the predominant characteristics of images in the digital age can be identified in the concealment of

[11] "TechnoImagination soll die Fähigkeit genanntwerden, durch Apparate erzeugte Bilder (Technobilder) zu verschlüsseln und zu entziffern" (Flusser 2008, p. 89).

[12] "Kurz gesagt und um mit Kant zu sprechen, sie erlaubt, die Kategorien der Wahrnehmung bewußt zu manipulieren" (Flusser 2008, p. 113).

their mediateness and in the denial of their characteristic of opacity, a possible way to rethink aesthetic education in the digital age may consist in making the characteristic of mediation that contemporary images tend to conceal, simultaneously fostering the syntony of imagination with the identification of technical affordances in the world. Within this perspective, the interactive quality of imagination would emerge in its constant relationship with the 'things' of the world-environment and the sphere of their affordances, their technical performances.

Secondly, the abovementioned implications regard sensory perception, as they concern the impact that immersive technologies have on our way of being in the world, experiencing images and acting on reality, outlining forms of intersubjectivity that transit between the iconic and the real. In particular, VR tends to isolate the users from the physical world, in our view AR devices can disclose new participatory and imaginative horizons. In fact, by connecting different intermedial channels and by augmenting reality through the use of multimodal information that is shared digitally, AR devices allow the coexistence and interaction between virtual and physical objects. A further step in the development of participative and multimodal horizons might be provided by upcoming and cutting-edge reality media devices, namely BCI – brain-computer interfaces (Gao *et al.* 2021), neural implants aimed at reading electrical brain signals and integrate external information with human consciousness and internal information with external devices. BCI neural implants are aimed at creating a 'neuroreality' that will likely lead to a further transition in the process of extension and externalization of technical devices, whose consequences might imply a relevant impact on the development of new forms of interactive imagination. In fact, on the one hand, the development of BCI devices might enhance our imaginative faculties by following the direction indicated by the French philosopher Michel Serres, who claimed that "the new technologies externalize the messages and operations that circulate in our neuronal system – information and codes, which are soft. Cognition, in part, is fitted out in this new tool" (Serres 2015, p. 25). On the other hand, the development of BCI neural implants, intended as technological devices that aim to the enhancement of human communicative and imaginative potentialities, sets in motion a process that Carbone defined as "a trend of internalization of the technology" (2019, p. 164). Such a process refers to the increasing use of our bodies as components of technological artefacts, making our bodily organs "quasi-prostheses", components of connected digital apparatuses that aim to strengthen

our potentialities, and among them our imaginative faculties. In our view, such cutting-edge reality media devices might contribute to the development of imaginative configurations characterized by an unprecedented interweaving of physiological and technological causality, the extent of which remains to be unfolded and studied.

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