

Virtual Reality Unveiled: Ontological Foundations and Epistemological Perspectives Through Western History

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Virtual Reality Unveiled: Ontological Foundations and Epistemological Perspectives Through Western History

Realidade Virtual Desvelada: Fundamentos Ontológicos e Perspectivas Epistemológicas através da História Ocidental

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Abstract

This study provides a thorough state-of-the-art analysis of virtual reality's concept as a significant medium in aesthetics. It seeks to explore virtual reality as a space of multiple possibilities, designed to manoeuvre viewers' perception through immersive experiences. To this end, the research begins by examining the ontological foundations of the concept of virtual reality, progressing to an epistemological approach that analyzes various examples of illusion and immersion spaces throughout Western history. This examination aims to elucidate the increasing utilization of virtual reality within the context of technological operationalization.

The investigative journey emphasizes the exploration of viewers' aesthetic experiences with artworks that employ virtual reality as a vehicle for expression at pivotal moments throughout history. In this context, a meticulous analysis of the historical framework enhances the understanding of artists' growing interest in immersive approaches and the adoption of virtual reality as a means of creative expression.

Keywords: Virtual Reality, Immersion, Illusion, Perception, Ontology, Epistemology

Resumo

Este estudo fornece uma análise aprofundada do estado da arte do conceito de realidade virtual como um meio significativo na estética. Procura explorar a realidade virtual como um espaço de múltiplas possibilidades, concebido para manipular a perceção dos espectadores através de experiências imersivas. Para o efeito, a investigação começa por examinar os fundamentos ontológicos do conceito de realidade virtual, avançando para uma abordagem epistemológica que analisa vários exemplos de espaços de ilusão e imersão ao longo da história ocidental. Este percurso tem como objetivo elucidar a crescente utilização da realidade virtual no contexto da operacionalização tecnológica. O percurso investigativo enfatiza a

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exploração das experiências estéticas dos espectadores com obras de arte que empregam a realidade virtual como veículo de expressão em momentos cruciais da história. Neste contexto, uma análise meticulosa do enquadramento histórico melhora a compreensão do crescente interesse dos artistas por abordagens imersivas e pela adoção da realidade virtual como meio de expressão criativa.

Palavras-chave: Realidade Virtual, Imersão, Ilusão, Percepção, Ontologia, Epistemologia

1. Introduction

In recent years, immersive technologies have significantly reshaped our understanding of art and perception, extending far beyond their commonsensical applications in entertainment and gaming. Virtual reality, in particular, has permeated diverse fields such as philosophy, psychology, and the arts, prompting a fundamental reevaluation of traditional notions of spectatorship and aesthetic experience. This paper explores how virtual reality, and other immersive technologies influence our engagement with and interpretation of multimedia artworks, focusing on these encounters' ontological and phenomenological dimensions.

Historically, advancements in visual techniques and technology have been closely linked to shifts in perceptual theories and artistic practices. From the proto-perspective of the Roman period to the introduction of linear perspective during the Renaissance to the 18th-century invention of the panorama, innovations in manipulating spatial relationships and viewer perception have continually transformed aesthetic experience. Techniques like foreshortening and perspective have been pivotal in creating immersive environments that challenge and expand our perceptual boundaries.

This study investigates how contemporary virtual reality practices continue this tradition by fostering dynamic interactions between viewers, artworks, and surrounding spaces. Drawing on the philosophical perspectives of Anne Friedberg, Erkki Huhtamo, John Willats, Jonathan Crary, Nelson Goodman, Oliver Grau, and Stephan Oettermann, it examines how virtual reality has been continuously cultivated.

Central to this inquiry is the relationship between immersion and attention in shaping visual practices. Immersion, characterized by reduced critical distance and increased sensory involvement, is facilitated by integrating perceptual systems. This phenomenon can manifest in both passive and active forms and is closely tied to the evolution from classical vision models to more fluid, contemporary representations.

This paper aims to bridge ontological and epistemological analyses with current discussions on virtual reality, tracing the evolution of illusionistic techniques and their impact on viewer perception. By doing so, it seeks to illuminate the ongoing relevance of these practices in understanding the complex interplay between art, technology, and perceptual experience. Ultimately, this exploration underscores how virtual reality, as a medium, reshapes our perceptual apparatus and redefines the nature of aesthetic engagement with reality.

2. Virtual, Illusion and Immersion

Virtual reality, a paradoxical expression first coined by Jaron Lanier, is deeply rooted in various areas of human-computer interface research (Grau, 2003, p. 22). As a union of contradictory terms, this paradox presents virtual reality as a space of possibilities (or impossibilities) formed by stimuli that deceive the viewer's perception (Grau, 2003, p. 15) through immersion processes. To understand how virtual reality operates at a certain level, we need to delve into three key areas: the virtual, illusion, and immersion.

Grau (2003) describes virtual realities as essentially immersive. Still, it would be wrong to assume that they are necessarily interconnected with digital media, even though the term was coined concerning the development of machine technology. According to Friedberg (2006, p. 8), the semantics of virtual refers to a substitute - an immaterial representative of the material. In its genesis, the term corresponds to the secondary position of all relations where something is derived from a principle, such as between the original and the copy.

The Platonic dialectic inaugurated the perception of the image as the false version of reality in the Western tradition. According to Deleuze (1983, p. 46), the Platonic dialectic is a debate of rivalry, of *amphisbetesis*, where the essence of division is based on the depth of lineage. This dual appreciation of understanding lasted and ended up moulding the aesthetic collective memory of the European continent. According to Friedberg (2006, p. 8), although thinkers such as Johannes Kepler, Galileo Galilei and René Descartes (among others) did not specifically distinguish between the real and the virtual, they still formulated precise disparities between the concepts of *imago* and *pictura*.

According to Kepler (2000), *imago* can be seen but cannot be measured, and *pictura* can only be projected onto surfaces and can be measured, such as the image that forms on the retina. This principle guided the enquiries that instigated the investigation into the workings of visual perception in the period. According to Friedberg (2006, p. 8), Kepler and later Descartes, this influenced using the camera obscura apparatus to describe the principles of how the human eye works and, consequently, the whole visual system.

Friedberg (2006, p. 8) attests that at the turn of the 17th to 18th century, in the study of optics in Western Europe, the term 'virtual' began to refer to the image seen through lenses and those that appeared in mirrors. Eco (1989, p. 12) draws on Lacan's psychoanalytic theory, specifically the mirror phase, to define the mirror as a threshold phenomenon that demarcates the boundaries between the imaginary and the symbolic.

Thus, Friedberg's (2006, p. 8) argument formulates that even though the virtual image was initially associated with the retinal image, it became linked to the concept of representation. This suggests that both meanings (simulated and mimetic) imply a distinct ontological register, "an immaterial form that is functionally but not effectively material" (Friedberg, 2006, p. 9). However, according to the author, in both meanings, there is a subtle change in the materiality of the image, which concerns both the image that has no material existence and the image that is formed in the representation.

However, if we assume the semantic nature of the virtual (where it refers to the correspondent of the secondary position of all relations where something comes from a principle) and combine the position previously discussed in this dissertation on the problem of reality, the doubt persists. How does virtual reality work on an aesthetic level (where *aisthesis* is the relational object of the image)? According to Grau (2003, p. 16), virtual realities arise from spaces of illusion.

Grau (2003, p. 16) describes spaces of illusion as places where the spectator is crucial. Here, the viewer receives an illusory stimulus created by distorting the perception of reality. The author argues that there are two possible levels of illusion: one that appeals to the viewer's playfulness and conscious submission and the other that intensifies the effect of the image appearing to the viewer, who can temporarily overwhelm their perceptual systems and suggest another appreciation of the space (Grau, 2003, p. 17).

According to Grau (2003), the historical starting point of virtual reality can be traced back to the spaces of illusion. These spaces offer virtual reality to the spectator through the domination of their perceptual processes, which the author understands as immersion.

It is important to emphasise that even though virtual realities are not exclusive to the contemporary world, according to Baudrillard (1996, p. 13), the status of the image (and consequently the use of virtual

reality as a resource) has been leveraged by a society addicted to duplicating the real through technology. In this sense, the author believes that the elevation of the employability status of virtual reality is due to the “uninterrupted circuit whose references and circumferences are nowhere to be found” (Baudrillard, 1996, p. 13). In other words, for Baudrillard, the semantics of the virtual no longer concern a substitute, an immaterial representative of the material, because it is a greater simulacrum.

The theme of the perception of reality and, consequently, its virtual potential has been one of the great themes in the history of Western thought since Plato's myth of the cave. It was boosted by Descartes, who focused on this issue in much of his work and Leibniz, Kant, and many others. Drawing on the work of Grau (2003), Gombrich (2007) and Willats (1997), the following pages will set out some of the knowledge relating to specific spaces of illusion and immersion strategies throughout Western tradition in an attempt to build a path that favours the development of these same resources that provide contemporary virtual reality.

3. The First Illusion Strategies

According to Willats (1997, p. 205), different disciplines have adopted different representative systems depending on the functions they should fulfil. To support his argument, the author gives three different examples. The first concerns the use of topological geometry on maps, as with metro maps, since only the spatial relationships represented (connectivity and spatial order) matter for their use. The second occasion concerns the use of orthogonal projections in engineering drawings, which, according to the author, is justified because of the extreme need to represent shape information reliably. The third occasion is silhouette icons in traffic signs, where the denotation system takes precedence over the drawing system since they need to be recognisable from a certain distance: darkness, rain, etc.

According to Gombrich (2007), all representation depends, to a certain degree, on 'directed projection'. The author's term refers to Information Theory, specifically the processes that lead to the gap between understanding a message and noise propagation. In short, the message concerns a set of possible states. A situation inversely proportional to this range of powers is noise, outside the possibilities of understanding a viewer's perceptual systems conditioned by their practical interaction with the world.

In this sense, the importance of using perspective in Western Europe until the 19th century is justified. Linear perspective, also known as artificial perspective, as described by Grau (2003, p. 37), introduces the notion of distance and dismantles the relationship of dimensions that was previously marked by the symbolic hierarchy in the representation of figures, something quite characteristic of European paintings from the medieval period, between 500 and 1300 AD. An example of this is the fresco by Giotto di Bondone, entitled *Fuga in Egitto* (1304-1306), in the Capella degli Scrovegni in Padua, Italy, where Mary and Jesus are represented in the centre in a much larger dimension than the other figures.

Based on scientific principles and “orientated on the visible *natura naturata*, a second fruitful nature was created, *natura naturans*” (Grau, 2003, p. 37). The linear perspective of the period between the 16th and 19th centuries inaugurated the possibility of objectively representing the referent based on a geometric system from a vanishing point, which, according to Trindade (2015), has specific projection requirements since the representations are not only limited to flat surfaces but also to curved and polyhedral ones, simulating architectures and fictitious elements made up of straight and curved pictorial elements.

Perspective, in its application, significantly impacts the viewer's perception. It allows the representation to achieve a high degree of verisimilitude compared to the referent, creating an illusion that enlightens and informs the viewer. The *trompe l'oeil* (trick the eye, in French) is an artistic typology that demonstrates this impact. It aims to represent an object or situation with the most significant possible degree of verisimilitude in relation to the referent based on knowledge of linear perspective. The result is a

representation that confuses the viewer's perception of the true origin of the image, providing them with a new understanding of art.

However, the question of illusion itself must be determined before the historical examples of illusion strategies are explained in the following subsections. Should illusion be understood as deception regarding the perception of an object's corporeal existence or as a complex two-dimensional system that dominates the viewer's perceptual systems and evokes the sensation of perceiving something three-dimensional, as in the case of a stereogram? Both aspects are developments of the same will.

According to Willats (1997), projection systems are a basis for classifying the various ways spatial relationships between elements can be represented in images (Willats, 1997, p. 37). In this sense, it can be understood that the strategies of illusion, although bifurcated in their respective *modus operandi*, start from the same root: the desire to represent in images, which, as a consequence of the use of representation strategies that are verisimilar to the referent, end up confusing the viewer's perceptual systems and consequently their judgement in determining the origin of that same image. Therefore, in this sense, illusions can be understood as a consequence of the development of verisimilar representations and the perceptual consequences inherent in the viewer's perceptual immersion.

In academic analyses, such as Milman (1982) or Grau (2003), the oldest examples of illusion spaces promoting spectator immersion date back to the late Roman Republic. The painted walls of the buildings found in the rubble of Pompeii reveal murals that have survived natural disasters and the force of time. The Roman city, located near the coast of the Gulf of Naples, was buried by solid waste from the eruption of Mount Vesuvius in 79 A.D. Responsible not only for devastating all life in the poignant city but also for stopping time and making Pompeii a testimony to the past.

According to Grau (2003, p. 25), the Villa dei Misteri houses the fresco 'The Great Frieze', created around 60 B.C. and covering all the walls of room number five. Twenty-nine life-size human figures are arranged against the marble-encrusted red background of the room's wall. The composition is rhythmic with *lisières*, where the figures are grouped in 5 x 7 metres spans. According to the author, if the opening that gives access to the enclosure is removed, the viewer's body is enveloped in 360° by the painting, dedicated to the cult of the Greek god Dionysus (Grau, 2003, p. 25). Although it has not survived the ravages of time, remains found in archaeological investigations have shown that the friezes were framed by representations of vines and human figures in erotic positions (Grau, 2003, p. 72).

On a formal level, the fresco features figures representing both human beings and gods arranged next to each other on the same pictorial level, portrayed in great detail, giving the painting a high degree of realism, such as: "the finely veined marble and alabaster, the gauzy transparency of a serving girl's chiton, the silvery gleam of a vessel, or the fine rendering of the hirsute silenus playing his instrument" (Grau, 2003, p. 25). The events that follow one another on a symbolic level are not explored in a successive spatial narrative, such as from right to left, but rather as a spatiotemporal unit, as shown in Grau (2003, p. 27).

According to Grau (2003), one of the main factors contributing to the Villa dei Misteri being called one of the first examples of a space of illusion is its proto-perspective.

The mathematically based linear perspective only developed in the 15th century. Meanwhile, 'The Great Frieze' is painted in a proto-perspective about a metre from its base on the ground, contributing to the optical effect of a bas-relief and, consequently, to the overall depth of the mural (Grau, 2003, p. 27). However, what most contributes to the effect that causes the perceptual illusion and immersion of the viewer is precisely the totality of the spatial image through its constant presence around all sides of the viewer's body. According to the author, despite being a unique example of illusion strategies, the fresco in the Villa dei Misteri is not the only immersive mural from the period. Examples with a lesser degree of detail and proto-perspective are found in the Villa Livia in Rome, Italy, dating from 20 BC (Grau, 2003, p. 29).

This exploration of early immersive techniques demonstrates the progression of spatial technique representation that would eventually culminate in the development of linear perspective in the Renaissance period. Baldassare Peruzzi painted the 'Sala delle Prospettive' (1516-1518) in the Villa Farnesina in Rome, Italy. The room features frescoes painted in linear perspective that fill the room's walls. The paintings, in one of their sections, depict a corridor with Doric columns, where the viewer can perceive in the background a realistic representation of the view of the buildings of the Roman Campagna, including the Porta Settimiana, the Teatro di Marcello and San Spirito. With an illusion of depth and orthogonal axonometric representation, the subsections of the view are painted in such a way that, when combined, the horizon appears continuous. The painting in the room is made up of a combination of three-dimensional elements with real functions, such as doors and a fireplace, and pictorial elements of the painting, creating an immersive space where the illusion is carefully provoked on the walls of the room.

Moving into the Baroque period, techniques such as *sotto in sù* and *quadratura* emerged, further advancing the art of illusion. Andrea Mantegna's oculus in the 'Camera degli Sposi' (1465-1474) exemplifies *sotto in sù*, transforming ceilings into perceived natural spaces. According to Grau (2003), it was the first work responsible for attesting to church ceilings as potential spaces of illusion based on the conception of the *sotto in sù* technique, which generally uses reduced figures and an architectural vanishing point to create the perception of natural space in a painted ceiling, most often frescoes, above the viewer, such as the 'Assunzione della Vergine' (1522-1530) by Antonio Allegri da Correggio in Parma, Italy.

In 'Assunzione della Vergine', it is possible to observe a "progressive intensification of action and an increase in precipitation" (Wölfflin, 2005, p. 93). In the most 'intense' part of the dome's composition, some arms, legs, heads and torsos emerge from a thick layer of clouds, as if they had been sucked by a vacuum originating from the centre of the dome, in a tremendous celestial tornado towards the sky. The raised fabrics allude to the effect caused by the wind on the garments, which contributes to the visual sensation of movement coming from the centre of the dome. In addition, the proportion of the figures depicted decreases as they get closer to the centre, reinforcing depth.

Around 1600, *quadratura* began to develop as a technique for enlarging pictorial spaces and established itself as a dominant taste among artists in Bologna, Italy. From the second half of the 16th century until the beginning of the 18th century, quadrature was internationally recognised as a perspective technique that promoted a more immersive illusion. In this technique, it is possible to observe a greater integration between architecture, painting, and sculpture, resulting in a more impactful impression of illusionism than in *di sotto in sù* techniques.

According to Grau (2003, p. 50), the names of the Carracci school, such as Tommaso Lauretti or even Agostino Tassi, conceived a fictitious architecture in perspective with a flat or vaulted ceiling so that the painting seemed to continue the existing structure of the building. The perspective is centred on a focal point, where the accentuated outline of the painted figures, walls and pillars creates the illusion of a deep recession, evoking a celestial sphere or even an open sky. Thus, ceiling paintings could simulate statues in niches or openings that reveal the sky, as seen in the nave of the church of Sant'Ignazio (1688-1694) in Rome, Italy, by Andrea Pozzo. A testimony, created:

"With great skill and the aid of science, Pozzo employed the techniques of illusion in order to merge the real with the painted architecture and extend it upward into heaven, as if heaven and the church space of the devout were at the same place. By contrast, the real architecture has the effect of a stage that surrounds the visitor" (Grau, 2003, p. 46).

Despite this, this painting by Pozzo is designed to be observed from a specific point on the floor of the nave. There is a need to position the viewer still to contemplate the whole illusion. This speaks to the limitation of the technique since the viewer is constantly moving. With the moving viewer, “the painted supporting columns become deformed, they warp, and the ceiling sky seems to be on the verge of collapse” (Hagen, 1980, p. 220)

As time progressed, the size of frescoes began to increase, leading to a significant evolution in art techné. According to Grau (2003), this period saw the emergence of complex images referring to Catholic imagery that increasingly filled church structures. The combination of frescoes with sculptures, integrated with the architectural structures of the buildings, created a large image that enveloped the viewer in a single, immersive atmosphere.

In addition, according to Grau (2003, p. 43), the *faux terrain* techniques crucially underpinned the development of illusion spaces throughout the history of Western Europe. Widely used in 15th and 16th-century nativity scenes, *faux terrain* creates the illusion of adding a third dimension to a flat representation, where the painting extends from the wall to the ceiling and the transition from horizontal to vertical is blurred so that the boundaries of the image are extended. The author states that these faux terrains achieve “this immersive illusionism with such powerful images appeared to transport the observer to the historical place and occupied the observer's mental images, fixing them unforgettably in the memorial exposition of the faithful” (Grau, 2003, p. 44).

Grau (2003, p. 45) cites Federico Zuccaro, who, in 1606 travelled to the Sacri Monti complex of devotional buildings in Piedmont and Lombardy, where the Sacro Monte di Varallo is located, the oldest of the ‘sacred mountains’ made on the initiative of Blessed Bernardino Caimi, who, on his return from Jerusalem (at the end of 1400), wanted to recreate the places of Palestine on a smaller scale. Seventy years later, St Charles Borromeo also took an interest in the project and gave new impetus to the work on the adoration complex, hiring artists such as Tanzio da Varallo, Morazzone, Fiammenghini and Gaudenzio Ferrari. The latter was responsible for creating The Calvary (1518-1522), which, according to the Mannerist painter Zuccaro, “it is these figures of colourful plasticity, as I said, that appears true, and their effect is likewise the truth” (Zuccaro, 1895, as cited in Grau, 2003).

Goodman (2006, p. 63) attests that images succeed in representing objects because they are constructed and read according to arbitrary but standard codes. From a post-structuralist perspective, “image is first of all an image; it reproduces the signified world of which it is the signifier in all its perceptual literariness” (Metz, 1964). Therefore, human sensory or image production does not occur arbitrarily but instead according to a representative response to the perception of space. A space that bases its existence on the viewer's perception. This explains how *faux terrain* can fool a viewer of Federico Zuccaro's *zeitgeist* into comparing a terracotta sculptural group in front of a painting with reality. Since they correspond to a world of signifiers referring to the Catholic image of the Piedmont region in the 16th century.

4. The First Illusion Strategies

The evolution of immersive visual experiences reached a significant milestone in the late 18th century with the advent of panoramic techniques. This period marked a pivotal shift in the representation of space, culminating in the invention of the panorama by Robert Barker. By employing a circular perspective, Barker's innovation transformed how panoramic views were depicted and fundamentally altered the viewer's interaction with visual art. This new technique, emerging from a unique confluence of artistic and military interests, paved the way for a more immersive and interactive experience in visual representation.

In 1787, Robert Barker patented a process called ‘La nature à coup d’oeil’ in which a panoramic view could be represented on an utterly circular support in the correct perspective. Under the light of the

technique that would later come to be called panorama, Barker created his first painting entitled 'A View of Edinburgh', which presented a 180° view of Edinburgh. For the first time, it "installs the observer in the picture" (Grau, 2003, p. 57). This effect was only achieved thanks to the precise drawing apparatus built especially for the panoramas, which considered the precise circular perspective.

Stephan Oettermann states in 'The Panorama: History of a Mass Medium' (1987), "In the panorama, natural image spaces are created in which the observers move around" (Oettermann, 1987, p. 23). According to Grau (2003, p. 58), this has enabled an immersive enhancement of the illusion spaces compared to the previous cases. An example of this development occurred in 1793 in Leicester Square in London, England, where Robert Barker designed the first 360° panorama. This roundabout was an architectural structure with a panoramic painting on its inner walls, consisting of a cylindrical space with a central opening in the ceiling, allowing natural light to enter and illuminate the painting. The viewer entered the enclosure through the central observation platform, surrounded by a balustrade. There, the spectator was enveloped entirely by the illusionist painting that lined the circular walls of the building.

5. The Relationship Between Immersion and Attention

The integration of perceptual systems is characterized by the merging of derived sensations, described by the Greek term synesthesia. This simultaneous collaboration is the condition that enables immersion, as this physiological capacity creates the necessary basis for an image to dominate the viewer's perception (Gibson, 1996, p. 54). According to Grau (2003), immersion is characterized by a reduction in the critical distance of what is perceived and the increasing sensory involvement of the viewer. In this sense, the viewer receives stimuli that engage their perception in illusionistic spaces. Immersion can often be described as the ability to be inside the imagistic space: "Immersion is thus being inside the image; it is the sensation of diving into it through all perceptual senses" (Morais, 2013, p. 66).

However, immersion does not necessarily need to occur within a space that envelops the viewer's entire body. Immersive processes are also observed in illusionistic spaces such as peep shows, where viewers must actively position themselves to hold what may potentially immerse them synesthetically with their hands. Thus, viewer immersion can occur either passively, with stimuli from a larger or smaller scale about their body, or actively.

It is important to note that immersion is not limited to images alone. According to Ryan (2001, p. 120), textual narratives, specifically literature, are significant enhancers of immersion processes, as the notion of reading as an immersive experience is based on the premise of constructing a "textual world" capable of transporting the reader to another spatial experience, distant from the reader's capacity for action or reality. According to the author, the reading experience can be compared to virtual reality.

Although immersion is metaphorically derived from the physical experience of submersion, perceptually, whether passively, actively, or at different possible scales, immersion is closely tied to attention processes. According to Styles (2000, p. 53), attention is a concept without a solid definition; however, attention can be interpreted as a consequence arising from the work of perceptual systems with the interaction of long-term memories. In psychology, attention is often defined as the cognitive process through which we select and focus our consciousness on certain stimuli or information while ignoring others, as seen in Styles (2000, p. 53). It is thus a mechanism that allows us to filter and selectively process information from space, directing our cognitive resources towards relevant or essential stimuli.

For Cray (2000, p. 13), when the logic of capital began to undermine any form of stability and longevity in the structure of perception, the historical and psychological problem of attention began to take root. This process is centred on the saturation of viewers' perceptual systems through the increasing availability of sensory stimuli. The author even points out that the unrelenting attention crisis is a crucial

aspect of modernity. According to Crary (2000, p. 20), it was initially caused by the collapse of classical models of vision and, consequently, the stable and punctual positioning of the viewer that these models presupposed.

Crary (2000, p. 84) argues that this shift from classical models of vision and perspective positioning can be seen in Edouard Manet's painting, *Le Balcon* (1868). In his paintings, Manet frequently represents attention not seeking immediate presence but oriented by the absence and erasure inherent in capitalist rationalization processes triggered by urban developments such as the Haussmannian reforms in 19th-century Paris. In *Le Balcon*, "the eye ceases to be a window, with transparent and transitive properties. Instead, the quiet circulation of receptive anticipation in this epiphanic painting is inseparable from the possibility, the dream of a new modern immediacy" (Crary, 2000, p. 83).

This shift in representation models facilitated the development of illusionistic spaces that proposed the viewer's perceptual immersion. In modernity, "it is possible to represent space as dependent on the direction of the observer's gaze: the viewpoint is no longer static or dynamically linear but theoretically includes an infinite number of possible perspectives" (Grau, 2003, p. 16).

6. The Virtual Reality in Multimedia Art

According to Popper (2007, p. 25), the use of machine technology in image production grew exponentially after the 19th century after the Second Industrial Revolution, enlarging the possibilities of achievable perspectives. An important ascending happening in the second half of the 20th century led to a transformation in the production of moving images driven by the digital revolution. As Manovich (2001) notes, the digital turn in the 1970s–1990s shifted mass media production, storage, and distribution to digital technologies, challenging traditional media distinctions and paving the way for new art forms.

As a result, artworks benefiting from the intersection of various media evolved into multimedia artworks. For example, in the early 1970s, Myron Krueger developed pioneering works like *Metaplay* (1970) and *Videoplace* (1974), exploring spectator interaction with computer-mediated images and creating shared virtual spaces.

Packer and Jordan (2001, p. 28) argue that defining "multimedia" is challenging due to its diverse phenomena. However, they suggest that computer-based multimedia works share five main characteristics: integration, interactivity, hypermedia, immersion, and narrativity. These features blend artistic forms with technology, enabling direct spectator interaction and creating immersive experiences through non-linear narratives.

Although not all multimedia artworks need to incorporate all these characteristics, they provide a foundational framework for analyzing multimedia art. Additionally, multimedia art often seeks to transport spectators to alternate realities, aligning with the conceptualization of virtual reality as a technology that immerses users in artificial worlds (Rheingold, 1991, as cited in Coyne, 1994). Virtual art is an imagistic construction rooted in a virtual space, evolving from early experiments with computer-based technologies that diverged from mainstream media, as seen in Huhtamo (1996). This evolution in art forms significantly influenced the expansion of aesthetic possibilities and the redefinition of artistic creation boundaries.

7. Conclusion

Following the in-depth analysis conducted throughout this study, an undeniable certainty emerges regarding the intrinsic relevance of imagistic evolution and its impact on Western society, from the nuances of the past to the contours of post-modernity. The investigative journey emphasised exploring viewers' aesthetic experience with artworks that use virtual reality as a vehicle for expression in pivotal moments throughout history. In this context, a meticulous analysis of the historical framework was conducted, enhancing the

understanding of artists' growing interest in immersive approaches and the adoption of virtual reality as a means of creative expression.

It becomes clear that the ontological investigation of virtual reality's concept emerges as a natural extension of the interaction between viewers and their environment, their understandings of space, and, consequently, reality. Since the early days of imagistic productions, virtual realities have existed as spaces of possibilities formed by stimuli that deceive the viewer's perception through immersive processes. This conclusion is substantiated by various examples observed throughout Western history, demonstrating the exploration of the inherent potential of virtual reality as a space of multiple contingencies and trends in manipulating viewer perception. This analytical epistemological exercise has elucidated the progression of virtual reality's immersive capabilities over time, stemming from its increasing use as a resource among artists through successive technological advancements.

The growing preference among artists to develop their work based on immersive strategies and the increasing use of virtual reality can be explained by understanding the fundamental interaction between the viewer, space, and perception in this context. The pursuit of immersive approaches, including virtual reality, emerges as a natural extension of this process, allowing artists to create experiences that enrich the understanding and interaction between the individual and space, exploring the potential for manipulating viewer perception and creating spaces of possibilities through immersion. Furthermore, the integration of artistic forms and technological instrumentalization observed after the 1980s contributed to the expansion of these possibilities, making virtual reality a powerful tool for artistic expression and creative manifestation and exploring the connection between perceived reality and artistic construction.

Nonetheless, given the ever-evolving nature of virtual reality and its expanding role in artistic and perceptual paradigms, further studies are necessary to deepen the understanding of its ontological and epistemological implications. Future research should continue to explore the intersections between technological advancements, immersive experiences, and the shifting dynamics of viewer perception, ensuring a more comprehensive grasp of virtual reality's enduring impact on aesthetic and cultural practices.

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