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Immersive Storytelling in cinematic, artistic and theatrical virtual reality works

Supervisor
Prof. Shaul Bassi

Assistant Supervisor
Prof. Pia Masiero

Graduand
Sofia Morandini
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877474

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Abstract

Within the domain of immersive storytelling, the present study aims to explore and discuss the potential of virtual reality devices as a means to convey engaging and interactive narratives and stories. Through a comparative analysis of traditional narrative theories encompassing the domains of literature, theatre and cinema, a theory of narration for virtual reality is formulated in light of interaction, immersion, and user-centred plots. Based on the virtual reality narrative theory provided, efficient storytelling patterns are described with respect to the narrative aspects inherent to the specific technology, the main ones being the visual property and the interactive approach. After the elaboration of a language for virtual reality storytelling, the history and features of this immersive technology are illustrated in functional connection with the user experience of the digital device and its components (immersion, presence, embodiment, interactivity, binaural audio). Given these theoretical premises, the study considers a variety of cases that comprehend selected cinematic, artistic and theatrical pieces produced by utilising virtual reality technology. Taking into consideration the user experience of this medium, the case studies are examined from different viewpoints and techniques in order to point at the elaboration of compelling storytelling patterns. The diverse stylistic approaches adopted, depending on whether it is a cinematic experience, an art installation or a theatrical piece, are considered as part of the discussion on the pros and cons of this innovative type of storytelling. Furthermore, various readings from the ecocritical to the political and literary perspectives are proposed with respect to the different virtual reality installations. Through a parallel with the narrative and expressive patterns of literature, theatre and cinema, virtual reality is displayed as an unprecedented medium of storytelling, yet replete with aspects and elements recalling the other domains. This exceptional commingling of sectors places virtual reality technology within the context of an intersectoral communication.

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1. Introduction

While virtual reality technology has become increasingly widespread and advanced in specific fields, especially in entertainment with VR games, as well as in the industry of design, medicine, architecture, training and education, its application in the artistic sphere is still quite recent and almost unexplored. In recent years, several contemporary artists and VR producers have accepted the challenge of employing this technology as an artistic and narrative medium through which they can deliver their creation, alongside other narrative forms such as theatre, literature or cinema.

The present study attempts to discuss virtual reality as an unprecedented means of storytelling in artistic, cinematic and theatrical 21st century works, emphasising the hybrid and intersectoral quality of this new art form and focusing on the core aspects that enhance the narrative power of the VR tool.

The first chapter of the dissertation illustrates several traditional narrative theories that can be connected to the definition of useful features for virtual reality storytelling. The narrative elements that stand out are the mimetic approach through which the story is conceived as a representation, the macro-structural method, which provides interpretative keys to narration, and eventually the processual and interactive property of stories where the user conquers the scene. The mimetic approach establishes the importance of visuality within storytelling, while the structuralist theories convey significance to the roles assumed by different characters, especially the protagonist and antagonist, ultimately the considerations on process and interaction explain the relevance of users in virtual reality experiences as they can play a fundamental part in the unfolding of the story, distancing from the predominance of the authorial perspective. On these theoretical grounds, the present study formulates three levels of interactivity, ranging from low to high, in accordance with different narrative forms concerning art, cinema and theatre.

The second chapter covers the main theme of the analysis, that is, immersive virtual reality storytelling, exploring several categories of narration that can be placed under the umbrella term of 'visual narration', which ranges from passive to mixed storytelling, as well as dealing with the major problems that VR narration encounters, such as how to achieve an effective combination of presence and narration. This combination leads to the understanding of both narrativity as 'experientiality' (Fludernik, 1996) – what it feels like *to be there* – and narration as 'storyliving' (Google News Lab, 2017) rather than storytelling since viewers are completely involved in 360° immersive experiences where they are allowed to play with perspectives while receiving emotional authenticity. As a matter of fact, it is the experience that is modelled on story, which produces memories for the user that can be as real as an actual experience. The participative and user-centred approach adopted by VR storytelling results in three levels of interaction, ranging from low to high, which correspond to the categories of visual narration identified with passive, active and mixed modes that in turn are connected with different disciplinary domains, from cinema to theatre.

The third chapter provides an historical overview of the evolution of virtual reality with respect to its definition and its devices, centring upon two specific headsets that have been used for the selected case studies, as well as it focuses on the major characteristics of this technology featuring in the VR narration modalities: immersivity, presence, embodiment, interactivity and binaural audio. These aspects are taken into account in order to be conformed to the user experience that should result as much genuine and comfortable as possible, allowing the user to familiarise with the virtual environment. These elements also contribute to the creation of VR narratives since they provide both the psychological and physical sense of being within the virtual landscape and, at the same time, they can implement the complex human-machine interaction where participation and embodiment are introduced.

The fourth chapter presents the case studies that were examined in light of their storytelling potential. After a brief description of the Canadian Phi-Centre's mission and project at the 58th Venice Biennale (2019), which points at the numerous virtual reality installations emerged either from the collaboration between VR producers and contemporary artists and theatre companies, or from the cinematic and documentary-style work of virtual reality studios, the first section introduces Felix & Paul Studios' virtual reality documentaries that are illustrated by also making a parallel with traditional cinematic techniques. Then, it will be the turn of art pieces like *Rising* by Marina Abramovic, which will be analysed in order to highlight the major narratives going through the works. Finally, a comparison between a theatrical virtual reality installation and theatre will be made to signal the similarities and differences between the two storytelling modes.

The final part attempts to provide an outline of the most efficient narrative modes for virtual reality storytelling emphasising the power of the story over the medium, which however has the ability to enhance certain aspects of narration, involving specific techniques and employing the stereoscopic viewpoint. The consideration on whether a virtual reality story can be deemed valuable or not is represented by the focus on the type of relationship that is established between the user and the virtual world. The diverse virtual environments should aim at generating a complete immersion of the users who in the best-case scenario are encouraged to suspend their own disbelief in a cathartic experience. Ultimately, what emerges is the role of virtual reality as an unprecedented narrative medium that promotes the intersection between technology and visual arts.

2. The Art of Storytelling

2.1. The origins

The ability to create and tell stories is the one thing that distinguishes humankind from the other species and, as Harari (2014) maintains, storytelling and the fictionalisation of the world enable humans to continually evolve holding a privileged position on earth:

> As far as we know, only Sapiens can talk about entire kinds of entities that they have never seen, touched, or smelled. Legends, myths, gods and religions appeared for the first time with the Cognitive Revolution. […] This ability to speak about fictions is the most unique feature of Sapiens language. (Harari 2014, p. 24)

The traditional craft of storytelling, which started with the Cognitive Revolution about 70,000 years ago, mirrored the ways in which learning and communication were conceived among individuals. The first forms of narration can be traced back to the 'teller-listener paradigm' based on orally transmitted tales where the storyteller would gather with listeners around fire – being firelit hours devoted to intimate conversations that evoked imagination and evening tales (Wiessner, 2014) - and through words and body gestures would communicate a story. Then, before the advent of written narrations, the very first appealing element of storytelling was represented by the visuality through which a tale could be conveyed enhancing the imaginative power of the receiver: about 50,000 years ago the main representatives of this kind of narration were the prehistoric cave paintings. These early tribal stories helped humans to make sense of the world and eventually evolved into rituals, myths and religions. By taking advantage of the human sight, those cavemen drawings could elicit a narrative thread on the viewers, and this is precisely what occurs in virtual reality, where almost all the human senses are activated in order to immerse users into a new unprecedented dimension. What

traditional and VR storytelling have in common is the imaginative power they encapsulate to transport individuals into a fictitious environment with its own rules, which is however the product of an imitation of the real world. Both virtual reality storytelling and traditional forms of narrative create imagined realities that, although being a fiction, are believable to the audiences. "Ever since the Cognitive Revolution, Sapiens has thus been living in a dual reality" (p. 36), namely the physical reality and the imagined reality.

But why did storytelling originate in the first place? The real motivations behind are still unclear but the Italian scholar Cometa (2017) offers an interesting insight that connects narration to the human biologic component (biopoetics) and proposes two lines of investigation within literary theory: Literary Darwinism and Literary Cognitivism. It is precisely the fil rouge connecting the cognitive sciences to the evolutionary theory that displays narration as something not merely relegated to the written sphere, but also as something visual that elicits feelings and emotions, empathy, phenomena such as embodiment as well as abstraction from reality, thus a link that transports narration back to its pre-linguistic origins. As a matter of fact, according to Cometa, already from the first human-made tools it is possible to evoke a prehistoric storytelling, especially during the crafting process and their social use (p. 66). It is specifically the *chaîne opératoire,* that is, the sequence of gestures and actions that serve for the creation of a tool, that entails a sort of proto-narration since it displays a consequential chain. Similarly, the first narrative modes indeed worked as the operational sequences, which are a sort of syntaxis without language (p. 71). Another aspect that the Italian scholar points out with respect to the creation of human-made tools is the cognitive ability of *blending,* which presides this type of crafting for it merged the functional element with the aesthetical, then ritual principle. The mental operation of blending is fundamental for the proliferation of new ideas, hence imagination, a dimension where past, present and future conflate (p. 216). Cometa connects this imaginative power to the capacity to suspend the disbelief within narration, thus exonerating oneself from reality through fiction that implies a detachment from the external world (p. 272). This phenomenon

depicts a need for a momentary alienation from the ordinary, an element that is very much present in the escapist narratives about what is yet to be discovered such as the space exploration travels (something that will be tackled more in depth in the case studies of VR *Space Explorers Series*). Going back to the theme of suspension of reality, in Darwinian terms, this *topos* is an adaptive property inherent in storytelling as an *antidote* (p. 280) to the existential anxiety that characterises humankind. Therefore, in the biopoetics framework, the narrative abilities appear to be the necessary asset to one's own self-preservation.

In light of Cometa's observations about narration as an anthropological urge, could virtual reality be considered a means for a new kind of storytelling, together with other existing narrative forms such as literature, theatre and cinema? To answer this question, it is necessary to move backwards in time in order to gain a thorough picture of the evolution of narrative theory that might be significant for the collocation of VR within this framework.

2.2. Narration: a brief review of narrative theories from Aristotle to contemporary perspectives

To understand how virtual reality can be tantamount to existing narrative mediums, with its own characteristics and peculiarities, it is relevant to make an overview of the narrative theories in the literary, theatrical and cinematic fields, highlighting their contribution to the creation of a narrative for virtual reality, as well as their downsides. Louchart and Aylett (2003) provide an extensive analysis of plot-based narrative theories, ranging from the mimetic forms of narration to those centred on the diegetic quality, which can be connected to virtual reality storytelling as well.

2.2.1. Authorial models

2.2.2.1. Narrative as a representation

The first narrative theory taken into consideration is Aristotle's plot-centred mimetic approach to tragedy (p. 11) where the structure of the story is prioritised, and the author is given a predominant role over the characters. This kind of approach has a deficient aspect with regard to the author-spectator interactive possibilities because it in fact does not allow any type of relationship dynamic and, when transferred to a virtual reality experience, this could become detrimental. Indeed, virtual environments allow users freedom of movement within the narration and interaction with the components of the story or even the storyteller. However, the plotline, if not prioritised, must be taken in high regard for it serves as a guide to the user who can be disoriented by the feeling of presence in real time within the virtual dimension and can lose track of how to proceed through the experience. Analysing these given assumptions, it becomes clear that an authorial model where the role of the character is constrained by the plot structure and elements is incompatible with the creation of an effective VR story. There is yet another aspect to be highlighted concerning Aristotle's theory: the idea of *catharsis*. The narrative capacity to evoke emotions and the suspension of disbelief on the spectator's part has a prominent role according to the Greek philosopher, and this is something true also for virtual reality experiences where storytelling becomes effectively immersive when it elicits feelings, such as empathy, because what is being displayed is coherent and believable to the user's eyes. One last aspect to be analysed in relation with VR is the mimetic activity of the Aristotelian representation, that is, its showing qualities that directly connect with the visual impact, common to the theatrical and cinematic forms, and that is privileged in virtual experiences as well.

In this respect, the spectator's role is taken into account for his/her engagement with the story through the use of sight, which in present cinema and theatre is evoked also by displaying different viewpoints. Particularly in

cinema the camera can be deemed an 'invisible observer' (p. 11). However, the drawback that emerges in the use of the cinema camera is that it coincides with the author manipulation of it, and this is not compatible with VR where the camera is transposed instead to the user who actually owns the control of it by choosing the direction of movement and seeing. Although virtual reality and cinema share the common ground of a visual narration, the former takes a step forward and shifts from the act of 'showing' to that of 'experiencing'.

2.2.2.2. Narrative as a structure

In plot-centred narratives, the structure of the story is fundamental as it stands for a sort of guideline. In this regard, it is important to mention the considerations of the Russian Formalists on the macro-structural narrative approach, hence focusing on the form rather than the story's specific content. It is in fact plausible to consider the formalist theory as based on a diegetic approach since it revolves around the role of language, specifically the concept of literariness and defamiliarization (Shklovsky, 1917), which are peculiar to literary expression. The main contribution of the Russian Formalists is on the formulation of *fabula* and *syuzhet* (Tomashevsky, 1965) as the two key components for the comprehension of narrative, the former being the chronological sequence of events as it is retrospectively reconstructed by readers, and the latter the ways in which the narration is conveyed and organised, which can either coincide with the fabula or be completely detached from it. Therefore, several (or infinite) *syuzhets* may emerge from one and the same fabula. On these grounds, a significant oeuvre, which again displays a macro-structural method, can be considered in the light of the Russian Formalists findings: *The Morphology of the folktale* (1928) by Vladimir Propp, which is a systematic analysis of multiple Russian folktales that aims at emphasising how stories have in fact a common underlying structure and common narrative functions, pointing at the recurrence of a storytelling pattern, as well as characters and actions. Propp indeed carried out his research considering around 100 Russian tales from where he extracted and individuated 31 different functions, each endowed

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with a correspondent symbolic identifier inserted in the bigger frame that worked according to the same logical and chronological structure. Specifically, fairy tales belong to the quest- or adventure-based structure centred on the hero's journey whose counterpart is represented by the villain, hence the main actions are processed by these two focal characters. If transposed to virtual reality, this kind of narrative structure could perfectly fit in quest-like experiences. On the other hand, it could become constraining with respect to the plot development and characters' roles because once more it does not take into account the possibility to break from the main storyline and the potential for interaction between the user and the environment around with its components. Again, if applied to VR, the author/storyteller would control the narrative and thereby grant little freedom to the user's movements and exploration throughout the virtual landscape.

2.2.3. Character-based models

2.2.3.1. Narrative as a process

Opposed to the Formalists, Chatman's *Story and Discourse* (1980) clearly displays his stance against the formulation of a universal narrative based on macro-structural patterns. He specifically addresses Propp's work holding that his model was in fact formulated before the determination of its rules and, although it might fit Russian folktales and fairy stories, it may not be suitable to other genres or to the same genre but with a different origin. He criticises the fact that Propp simplified the complexity of narrative by conferring it a universal property. Along with *fabula* and *syuzhet*, Chatman adds a third component that he calls discourse, that is, how the story is conveyed. There can be multiple discourses within the same story that contribute to the dynamicity of the narrative thread, in the sense that story is seen as a process rather than a static unit. If stories are seen as a processual development, discourse implies a complexity of meanings and context. When transferred to the VR experience, discourse becomes an essential means through which interactivity can be contemplated. As a matter of fact, Louchart and Aylett

(2003) describe different types of discourse that might occur in an interactive form of storytelling: the discourse of the author; the discourse of the spectator; the discourse of the user participant. The first, as the term indicates, is referred to the storyteller, whose aim is to convey his/her unique vision to the spectators who act as recipients of the authorial discourse, therefore they are attributed a rather fixed and passive role. The second type of discourse is oriented towards the audience members who in this case have a dynamic and flexible role, while the storyteller is not allowed a complete control on the narrative, but rather positions him/herself as a supporter of the user's interaction with the story. This leads to the third kind of discourse, which is also defined as *storification* (p. 5), and refers precisely to the spectator that has become an active user and participant of the narrative process by blending his/her own viewpoint and experience of the story with that of the storyteller by means of interaction with the surrounding environment. Although Chatman's introduction of the concept of *discourse* is conceived as a different tool through which existing narratives can be interpreted, the same idea of discourse entailing three macro elements - story, storyteller and user – can be applied to demonstrate the existence of a new narrative that prioritises the interaction between user and the story components. This kind of dynamic narrative seems more apt to virtual reality storytelling, rather than the authorial models because it fits the real-time nature of the immersive and in person experience. While literature and cinema convey the narration with much freedom of time and space, virtual reality stories, as it happens with theatre, take place at the very same moment in which the user is actually experiencing it, hence the VR medium is essentially incompatible with the narrative modes featuring in novels and films.

2.2.3.2. Interactive narrative

In the last decades, a different approach has emerged with respect to digital storytelling and the focus has shifted from the analysis of the narrative structure to the aspect of user engagement by means of interaction. In this model, the user is considered on a par with the storyteller, as a sort of co-

author, who becomes an active part in the development of the story. In this sense, it is possible to build a parallelism with Wolfgang Iser's literary theory of reader-response criticism that, as happens in virtual reality with users, centres on readers and their reaction to a literary work and allows the readership to become an active part by completing the meaning of the work through interpretation, personal experience and incorporated knowledge. Iser introduces the concept of *virtuality* of the text arguing that 'it is the virtuality of the work that gives rise to its dynamic nature, and this in turn is the precondition for the effects that the work calls forth' (Iser 1972, p. 280), conceiving virtuality as the readers' capability to *fill in the gaps* in order to explore diverse literary worlds. Several studies have been carried out on the comparison between virtual reality and literary theory concerning the role of the user and the reader, respectively. For instance, a substantial contribution to VR narrative as based on immersivity and interaction is provided by the literary theorist Marie-Laure Ryan (1999) who attempts to examine virtual reality as a semiotic phenomenon. She compares the concepts of immersion and interactivity within the domains of literature and virtual reality to understand their potential in both sectors. As for immersion, she holds that the notion 'depends on vividness', and 'its factors are closely related to the devices that lead to realism in representation' (p. 112). Indeed, within a virtual environment, users are surrounded by a mimetically plausible world, which they can navigate and explore in real-time thanks to their bodily presence. The feeling of immersion is therefore generated through multiple sensory stimuli and by an uninterrupted shift of perspective; this means that when the user moves, the display changes as well. The virtual reality experience creates a sense of unmediated presence on the user, and compared to the illusionist art, it generates the same effect of the *trompe-l'oeil* (p. 113) with the result that the medium is not perceived by the viewer since he/she experiences the virtual world as though it were real and not fictitious. The immersive quality of virtual reality is compared by Ryan to the domain of literature (p. 114) in the sense that novels too have the power to engage the reader in such an intense way that he/she becomes completely absorbed by it, and this does not mean that the story narrated is characterised by realistic properties that equal it to

the physical world. Conversely, the world displayed should have the power to suspend the reader's disbelief for a given period of time. If immersion is correctly achieved, this kind of absolute involvement occurs in the virtual dimension as well. In this regard, it is possible to make a parallel between *possible worlds* literary theory (p. 115) and VR: while the former suggests that there is a multiplicity of worlds that are generated by the human mind through imagination and that are, in fact, represented in fiction, virtual reality allows an adding component to the mental product, which is the bodily dimension. The possible worlds can be truly realised through the virtual device that immerses the user within them. This is the kind of narration centred on the 'pretend play' or 'make believe', whereby both the mind and the body are involved in the fictitious dimension in what Cometa defines as a narrative exoneration from reality (2017, p. 272, own translation). In the literary domain, for instance, the narration within a novel is deemed an account of real happenings where the reader is carried by the unfolding of the story in either an intradiegetic or extradiegetic way. The intradiegetic case is particularly apt to virtual reality because the user becomes an active participant in the storyline and an actual member of the fictional realm, completely immersed in the virtual environment to such an extent that the feelings and emotions experienced in it can overflow into the physical world. According to Cometa (2017), the fiction and simulation are adaptive activities through which humans detach themselves from reality as a sort of preservation act against the existential anxiety common to mankind. Specifically, this ludic approach to narration becomes a means of understanding and prefiguring complex experiences, which in fact would require an enormous amount of energy in the real world. If the make-believe is efficaciously introduced, the experience can become as real as those occurring in the physical world, and the readers/users might feel transported within the story employing their own experiential background to build connections with the narration itself to make meaning of it. This linking action between the physical and narrative world is well explained by Richard Gerrig, who suggests that readers:

Must use their own experiences of the world to bridge gaps in texts. They must bring both facts and emotions to bear on the construction of the world of the text. And, just like actors performing roles, they must give substance to the psychological lives of characters. (Gerrig 1993, p. 17)

This phenomenon is explained by Gerrig through the transportation metaphor whereby the readers experience the feeling of losing themselves into the narrative dimension, distancing from the physical environment. This transportation depends on an immersive reading (Ryan 1999, p. 117) that allows the reader to generate his/her own fictional body in the story, and this is a concept that can be transposed to virtual reality since the user is materialised in the virtual world through the use of an avatar that relocates the physical body into the digital realm. Again, the medium is eclipsed: in the case of a novel, the readers feel no longer attached to the material property of the book, they instead are immersed in the story and empathise with the characters as they were real and not fictional entities. Similarly, in virtual reality, the users ideally happen to be so absorbed by the virtual experience that they forget to be anchored to their own body and actions, they literally forget the presence of a headset and controllers as their own eyes and hands to see and move throughout the virtual world. As occurs in fiction where the narration often conceals an underlying reading level that prompts the reader to reflect on the unsaid, in virtual reality the user is faced with a three-dimensional world, which offers him/her the possibility to take different positions but never simultaneously, hence there is always something that is left unseen from the user's given perspective and stance. From the point of view of immersion, both fiction and virtual reality allow multiple viewpoints and spatial mobility within narration, which can break the limits of human perception thanks to the creation of a fictional world that, if transposed to the physical realm, is rarely accessible:

Fiction offers a mobility of view at least as extensive as that of VR systems. The development of a type of narrator specific to fiction – the

omniscient, impersonal narrator – has freed fictional discourse from the constraints of pragmatically possible human communication. The disembodied consciousness of the impersonal narrator can apprehend the fictional world from any perspective, adopt any member of the fictional world as focalizer, select any spatial location as post of observation, narrate in every temporal direction (retrospectively, simultaneously, even prospectively), and switch back and forth among these various narrative modes. Fiction, like VR, allows an experience of its reference world that would be impossible if this reference world were an objectively existing, material reality. (Ryan 1999, p. 119)

As a matter of fact, the less accessible an experience is to the human physical dimension, the more immersive is since it engages the reader/user for the same exonerating principle discussed earlier. Hence, the popularity of the escapist narrative and the virtual reality experiences about space travels. Nonetheless, when combining immersion with interactivity – the other major feature of virtual reality narratives – the text loses its balance and proportions. In fact, the more interactive a literary work becomes (i.e. a choose-your-own adventure text) the less immersive it results. In a way the interactive aspect of a book is detrimental to its immersive potential because actions in the real world implicate the reminder that the fictitious realm is being experienced through a medium. Therefore, authorial narratives cannot be proposed as a suitable storytelling model for virtual reality insofar as immersivity and interactivity are merged. In literary texts, when examining the immersive aspect alone, a great number of writers have warned against the perils of immersion in fiction in the sense that an excessive detachment from reality might endanger the individual's perception of the real world as it happened with Walter Scott's young hero Waverley at the beginning of the novel:

[I]t was that Edward loved to 'chew the cud of sweet and bitter fancy,' and, like a child among his toys, culled and arranged, from the splendid yet useless imagery and emblems with which his imagination was stored, visions as brilliant and as fading as those of an evening sky. (Scott 1845, p. 30)

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Scott depicts his hero as someone whose favourite pastime is building castles in the air, living in an idealised Romantic world formed by his own imagination triggered by the stories of his ancestor's heroic deeds. However, he is conscious of his 'weakness' to the point that he tries to hide it from the others, thus he is able to discern between the real and the fictional world. In fact, he is then able to emancipate himself from this passive condition and take action in the real world. Conversely, characters such as Don Quixote or Emma Bovary are marked by an extremely biased imagination to the extent of creating a dimension of their own completely detached from the physical world, which eventually condemns them to failure. The triggering element to that fervid imagination is provided by an almost devouring and all-absorbing reading activity that immerses them into a fantasised domain preventing them from using a rational approach to reality. Virtual reality as well has been much criticised for its immersive component described as having a hypnotising effect on the user who is submitted to the storyteller's world. But the truly subversive concept residing in virtual reality, which in fact has become object of debate within the postmodernist theory, is the gradual disappearance of signs 'in an age that regards signs as the substance of all realities' (Ryan 1999, p. 120). According to postmodernists, the process towards an invisibility of signs that a transparent medium would implicate, deprives readers/users of their critical thinking because they are no longer able to consciously acknowledge reality. In this way immersion is envisioned as a passive concept to which the user is subjected, however, it should be considered the active aspect of virtual reality as well, that is, as suggested before, its interactive component:

> Interactivity is not merely the ability to navigate the virtual world, it is the power of the user to modify this environment. (…) In a truly interactive system, the virtual world must respond to the user's actions. While the standard comparison for immersion derives from narrative fiction, the most frequently used metaphor of interactivity invokes theatrical performance. The simile captures a largely utopian dream of

dramatic art: putting spectators on stage and turning them into characters. (Ryan 1999, p. 121)

Through a parallel with the theatrical domain, Ryan conceives virtual reality users as spectators who become characters on stage and have the ability to potentially modify the unfolding of the story, hence they exercise an influence on the development of the plot rather than just being mere viewers. This refers to the power of the human-machine interaction, which entails a specific representative model defined as simulation. This specific typology of representation can be compared to the act of imitation characterised by a dynamic property that places it within an unrepeatable narrative domain. In fact, simulation not only involves change and action, but also is characterised by non-iterability: each use of the virtual reality device reveals to be different depending on the user's perceptual dimension. While a cinematic representation can be played multiple times without modifications, the simulation must take into account the variable of the human user. In this sense, the virtual reality experience with its own rules has to be understood by its user in order to create an immersive interactive relation between the two parts. For instance, the VR theatrical installation *Believe Your Eyes* puts the spectators at the centre of the stage to which they enter in *medias res* and become part of a bizarre dialogue with a desperate woman, thus they are interacting with the virtual character on a visual level. Along with the sight, there are other senses stimulated such as the hearing, which mixes the audio coming from the digital device with that proceeding from the outside (the users actually hear like steps gradually approaching them), and the touch for the viewers feel unknown hands brushing up against their skin. All these stimuli that are provided from both the virtual and the physical environment must be comprehended by the user in order to efficaciously interact with the narrative, otherwise he/she could feel overwhelmed by all the simultaneous inputs and could decide to interrupt the experience. As it is possible to concretely notice from the previous example, another important aspect of interactivity is the real-time effect. In fact, if the users correctly interact with the virtual reality system, the response will be immediate, and they will feel their movements tied to the

present dimension. In this regard, virtual narration does not allow a thorough knowledge of the events but its development changes according to the user experience of it:

> The system can (…) be compared to an alphabet containing all the books on a given subject, while the simulation itself is the actualization of a potential book, a book that vanishes when the writing is completed. (Ryan 1999, p. 123)

While the traditional literary narration works retrospectively in the sense that the writer already knows all the events that are in fact contained in the novel, virtual narration works prospectively since the storyteller envisions multiple potential paths that participants can undertake in real-time, thereby allowing freedom to the plotline development 'without knowledge of the outcome' (p. 123). However, this freedom must somewhat be controlled otherwise it would lead to chaos: the user participation in the virtual environment should be limited by technical and narrative boundaries combining predictability of action with an element of surprise that encourages the spectator to continue the experience. Comparing literary and virtual narratives, the former displays interaction on a figurative level (p. 126) for it refers to the collaborative relationship between the reader and the text with respect to the generation of meaning (Iser, 1972) and it is deeply connected to the aspect of immersion since both converge in the construction of imaginary worlds that do not materially exist; the latter instead envisions interactivity as something concrete tied to bodily presence and real-time dimension, but always profoundly intertwined with immersivity.

Through the comparative analysis between traditional narratives that favour an authorial approach and those that instead prioritise a participatory interactional concept that places the user at the centre of the story-world, virtual reality seems to better conform to the second narrative mode that conceives the story as a processual dimension based on key concepts such

as immersion and interactivity, which directly involve the user within the virtual environment.

Louchart and Aylett (2003) suggest a participatory form of narrative flexible to the potential development of the plotline that can privilege the real-time dimension in the process of *storification*. There are already other approaches to participative narrative such as Live Role-Playing Games and Interactive and Improvisational theatre. Especially the latter presents features that are common to virtual reality as well for it is tied to the real-time dynamic and allows interaction between actor and spectator, who in fact becomes 'Spect-Actor' (Boal 2000, p. 22) pointing at his/her dual and active role in the play. A particular importance is given to the concept of causality (Aylett and Louchart 2003, p. 21), which reveals the number of consequences an event may provoke rendering the narrative unpredictable or not completely predictable. This dynamic system of virtual reality considers the user experience, hence his/her attitude and behaviour towards the digital tool, as a major resource for the unfolding of the story.

The present study adds to the user-centred and processual narrative approach an analysis of the different degrees of interactivity allowed depending on the domain to which the virtual reality storytelling is linked. As a result, there are multiple levels of user-story interaction that range from low to high, from the cinematic experience characterised by an observative interaction to the theatrical piece that envisions the strongest degree of interactivity. After the presentation of virtual reality as a narrative tool on par with the other media, different forms of VR storytelling will be illustrated in the fourth chapter in correlation with the various art sectors.

3. Virtual Reality Storytelling

Although "VR is not necessarily a storytelling medium, and often it is essentially an experiential medium" (Popat 2016, p. 358), virtual reality as a storytelling tool can be translated as the action of modelling experience into story. The combination between story and experience in a virtual dimension is a complex process to carry through because of the several possibilities virtual reality offers both to the storyteller, who is required to translate a story into an experience, and the spectator, who sometimes can feel overwhelmed by the abundance of options. As examined in the previous chapter, if one compares traditional storytelling mediums, such as books, stage plays and films, with virtual reality, the very difference is to be found in the diverse focus: while traditional narratives are characterised by a plot-driven approach, virtual reality storytelling relies on a user-centred model that considers the plot not as a predominant element in the narration, but as "one component designed to work in tandem with other storytelling elements to realize the full vision of the story" (Damiani, 2017b). The different approach adopted is also due to the very nature of virtual reality, which should convey to the user a double feeling of immersion and presence within the virtual world. These two VR components provide a whole new series of opportunities to be explored but, at the same time, they also imply unprecedented creative limits. To set a parallel, virtual narration is very much similar to the dynamics found in live theatre in which the traditional stage is absent, and the spectatorship is involved in the actor's world at the very same moment action takes place. The viewer's feeling of presence is a double-edged sword: in fact, if it is well evoked, it leads to the user's full immersion in the virtual environment. At the same time, it imposes several rules to be followed: first and foremost, consistency. This means that camera placement, editing, acting, sound and production design must be coherent to each other so that the user does not feel disorientated and detached from the virtual world. One of the most challenging aspects to be taken in consideration is the pre-production step: here, the storyteller is asked to understand in advance the user's movements in the virtual world in relation with the VR tracking system, which detects the

user's gaze and action through the headset. Also, to truly immerse the viewer, VR bandwidth requirements should be met in order to provide high quality graphic resolution to the users even when they are in action. Moreover, the stereoscopic view implies a long post-production work because it is fundamental to edit and eliminate all the shooting tools since the user has a 360-degree perspective. On the other hand, the unexpert users are not accustomed to an immersive landscape, so they will likely watch only what is in front of them and not behind or besides them, hence the need to 'educate' them to this new kind of 360-degree environment. If all the above-mentioned aspects are rightly handled, storytellers:

> [C]an trigger curiosity with sound, light, animation, or movement so viewers naturally turn in a certain direction. These elements can help guide people through the story. I want people to get the essence of a story, no matter what they decide to do and no matter what the medium. (Kantor, 2018)

When the story is perfectly adapted to the virtual reality medium, it generates memories within the viewer's mind, which can reach a degree of realness that is similar to an actual experience, as though that precise story had actually occurred to him/her. This is the great power of virtual reality as a narrative medium because it has to do with 'storyliving' (Google News Lab, 2017) rather than storytelling since the user lives the story instead of being told it:

> I think when we're saying 'storytelling' we're putting on a cognitive toolbelt that belongs to a different medium. There is no teller in this sense, because it is a direct sensory experience. The storytelling is the retelling or reenactment of something that happened to someone else or something else, before. But VR is happening to you, here and now. I'm not saying 'storytelling' is a forbidden word, but using it anchors us into something that VR isn't. (Björling, 2017)

Due to this highly immersive, realist, and visual quality, VR has also a great potential for eliciting empathy and emotional states that allow users to shift their perspective and be embodied into a different condition.

An ethnographic study carried out by Google News Lab in 2017 found out that there are three main factors concurring to the realisation of engaging stories through the VR medium: the first is related to the user's feeling of presence within the story according to the principle of showing rather than telling; then, the second factor is linked to the user's possibility of changing viewpoint throughout the VR narration; ultimately, virtual reality is a meaningful medium for conveying specific emotional states and experiences thanks also to the feature of embodiment. Within 'storyliving', the user experiences three phases: initiation, which represents the beginning of the journey in the VR story; exploration that provides the user with the possibility of agency and interaction; comprehension, which stands for the conclusion of the VR narration and the user's search for understanding and contextualisation of what he/she has just experienced. As explained earlier on, the extremely immersive property of virtual reality allows the viewers to change, shape and shift their perspective by means of embodiment into someone or something alien to them, but what is even more striking is that users often experience such an intense feeling that they remember what they have sensed when embodying another condition. For instance, in the art piece *Lunatick* one is provided with the nonhuman ability to fly from the Earth to the Moon and to feel the absence of gravity on the lunar surface, which are two states that are completely unfamiliar to the human body. Another form of exploration inhabiting the body of somebody else is the one proposed by the VR cinematic series of *Space Explorers* where the user is able to closely see the activities of real-life astronauts as though he/she were a colleague training for an upcoming mission, thus personifying the specific condition and experience of an authentic spaceman. This strong sense of embodiment and immersion inevitably leads to the generation of powerful emotional responses on the user's part by also employing high quality graphic resolution that conveys realness to the VR experience:

> [I]n the present as in the past, in most cases immersion is mentally absorbing and a process, a change, a passage from one mental state to another. It is characterised by diminishing critical distance to what is shown and increasing emotional involvement in what is happening. (Grau 2003, p. 13)

Although the emotional authenticity that VR can convey has possibly a contaminating side effect on the viewer's ability to recount the story that he/she has lived, it is precisely this immersive property that defines the VR experience in the user's mind as a memory of something that has truly happened to him/her.

Compared to novels where one is not really present in the story told and has to imagine what is being described, virtual reality stories play on the visual potential of narration making it the vantage point on which to rely to captivate the viewer's attention.

3.1. Visual Narration

As it happens especially with films and videogames, visual narration is inherent to virtual reality experiences as well. What distinguishes the first form of narration from virtual visual storytelling is that the latter is not tied to a traditional frame narrative but is instead characterised by a 360-degree overview. As a matter of fact, films feature a fixed rectangular visual frame in which all the attention of the viewers is catalysed; conversely, in virtual reality the spectators do not have a frame but rather a perspective of their own through which they can look everywhere in the virtual landscape.

> For storytelling purposes, invisible interactivity is the single most important capability differentiating virtual reality from any other medium. For the first time, content can react to the viewer in a fully

visceral and seamless way. The story doesn't need to stop in time for you to decide between two illuminated doors – the content already knows which you'd prefer based on where you have been looking. (Dorsey, 2017)

Invisible interactivity relies on the potential of virtual reality to provide the user with multiple perspectives to be explored without an authorial intromission. Therefore, there is not a unique point of view (POV), because it indeed depends on the user's field of vision, which is merely subjective and bond to what he/she decides and intends to see during the VR experience (Pillai and Verma 2019, p. 2). The potential downside to this is that some viewers might experience FOMO, that is, the 'fear of missing out' if there is abundance of simultaneous visual information, which is something expected in a 360-degree environment and that can therefore distract and disorient users. However, this same phenomenon could also trigger the curiosity of not knowing whether there is something else to be seen or to interact with. For instance, in Abramovic's *Rising*, several users felt captivated by the fact that they did not know whether they could truly interact with the artist's avatar by saving her from drowning or not, thus in this case FOMO was ingeniously employed. This means that if the storytelling experience is not well structured, users will probably feel this freedom of POV as a distracting element and not as a useful tool, hence the need to design accurate visual narrations that take into account the perceptual level. The result to this kind of 360-degree visual storytelling is that users do not rely on rationality by detecting details of the story, but rather have an impressionistic impact of the experience remembering mainly the specific feelings they have undergone instead of the particular elements of the narration. Each experience results different, even to the same user that tries it multiple times, and this is because each viewer is provided with several POVs, which transform all the narrative events into potential frames, everything becomes a possible window to the virtual world depending on the spectator's perception. Of course, the VR creator and storyteller envision intended point of views that are considered as narratively significant and therefore are expected to be encountered by the user. For

instance, in the cinematic *Space Travellers Series*, the viewers are allowed freedom of view throughout the 360-degree environment, however, whenever there is a relevant scene to the narrative development, a speaker in the role of an astronaut is introduced to capture the attention of the user. If the viewers are looking in a different direction, they will immediately turn their heads to see and listen to their interlocutor. Another attentional cue utilised in the case studies of *Rising* and *It Will End in Stars* concerns the subtitles: significant concepts within the narration are emphasised through writing. In the first instance users are immersed in an aseptic dimension that they must explore in order to discover the artist's avatar. While navigating throughout this environment, they are suddenly captured by the artist's voice, which is graphically translated into subtitles written in red characters contrasting against a black background. In the second case, the protagonist in the form of a wolf narrates his own story while walking through his hut and words randomly appear as he speaks; users are asked to make sense out of the interrupted sentences that they see emerging and then suddenly vanish, following a sobbing movement. In both the experiences, the written element serves to reposition the user's attention, which might have been drawn to some other aspect in the environment, at the focal moment of narration. These are defined by Pillai and Verma (2019) as effective visual cues that help viewers to orient themselves within the virtual landscape. As in traditional narratives, visual cues represent particular spatial and temporal points that are equated with visual centres of interest, which have been identified with the following elements (p. 4):

1. Character addressing the viewer: if the viewer is directly addressed by the protagonist of the narration, he/she will likely be interested in facing the latter. For instance, in Nathalie Djurberg's artwork, the first character appearing in the narration that is also the only speaking figure is a menacing wolf. This threatening aspect together with his words becomes an element of interest for the user.

2. Graphics or logo that contrast with a static environment: as illustrated above, the visual graphic aspect displayed by the subtitles synchronised with the characters' words considerably helps the viewer in guiding him/her towards

the intended POV. Another use of graphics can be provided by the introduction of a subtext that specifies what the characters mean but do not say, which can lead to multiple interpretations on the viewer's part.

3. Balance between action and inaction: considering again the case-studies of *Rising* and *It Will End in Stars*, both of them display a static first scene, where the spectator only observes and listens, and then it moves towards a second dynamic phase where the user is requested to perform actions and make choices.

4. Transitions:

> Many people think that you can't cut in VR or that it will be too jarring and this can be true depending on what you are cutting from and to [...] You can absolutely shoot coverage in VR from different camera positions and cut between them [...] Most important are the pace of the cuts. Every time you cut it's like you're teleporting to a different location and that can be very jarring especially if the pace is too quick so you'll want to slow this way down. The viewer needs a good amount of time within a new position to fully immerse themselves, look around, and get their bearings. Cut too quickly and your viewer will be frantically looking about trying to figure out what is going on and what to look at all while you are tiring them out. (JauntVR 2017, pp. 39-40)

As the CVR company Jaunt illustrates in their guide to help VR producers to create compelling immersive stories, the change from one shot to another must happen in the least drastic way possible, maintaining the elements or characters that could be visually connected between the two adjacent scenes. This visual strategy stands out in the case-study *Traveling While Black* where the users find themselves in a cinema theatre during a show, and in the following shot they are plunged into the film that was screened a moment before. Hence, the visual cue utilised here is the common element of the film that in the first scene is experienced from an external POV and in the second shot from an internal perspective instead. If the shot cut is correctly made, the

viewer will be easily oriented towards the intended point of view. However, the cut could also abruptly happen when for example there is a 'teletransportation' scene, that is, a moment in which the user is suddenly transported into a completely new environment. This immediate transition could feel disorienting on a physical and intellectual level, hence it is important to let viewers adjust their own internal dynamics by avoiding to present new attentional cues immediately after the shot cut is made.

Intended Primary and Secondary Experiences: multiple plots can be inserted within one and the same experience in order to provide the user with several POVs. For instance, in *It Will End in Stars* there are two storylines: the main one being the wolf's tale in the context of a menacing hut isolated within the woods, and the other subplot being the disturbing sculptural figures that are accessed through different angles of the hut. In technical terms, the connection between several storylines, which allow the user to fully explore the virtual environment, can be achieved through the introduction of interactive elements, similar to hyperlinks, which teleport the user back and forth in a virtual navigation (see figure 1).

VISUAL ELEMENTS

360 degree image or video

2D images placed in pattern

Interactive objects placed in VR space which can be used to teleport the user to other stories

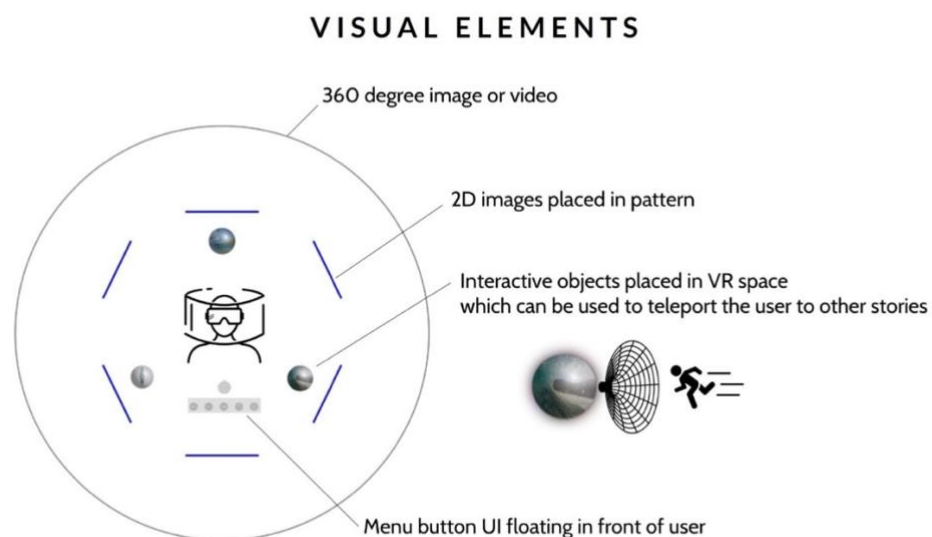Menu button UI floating in front of user

Figure 1 – explanation of interactive visual cues allowing the user's teletransportation

If the visual stimuli are efficaciously placed, the user experience will conform to the intended experience created by the VR storyteller. This means

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that the environment generated is highly believable to the viewer who indeed feels present throughout the experience. The phenomenon that emerges when the user's expectations, attitude and attention are on the same level of the virtual reality story and he/she is compelled to participate and complete the experience is defined as 'experiential fidelity', namely "improving the user experience by increasing the alignment of what the VR experience provides with that which the user is likely to believe" (Lindeman and Beckhaus 2009, p. 188). This concept will be further developed in the next chapter as it is strictly connected with the user experience and the VR components of immersivity, presence, embodiment, interactivity and binaural audio insofar as the visual and audio cues are concerned.

3.2. Three categories of virtual reality storytelling

Having identified the main features of visual narration in virtual reality, it is equally important to signal the different categories (passive, active and mixed) that can be found according to the varying degrees of interactivity inherent in VR storytelling.

Virtual reality experiences		
Storytelling Modes	Interaction	Domain
Passive	low	Cinema
Active	medium	Art
Mixed	high	Theatre

Figure 2 – Overview table of different interaction levels according to the storytelling modes and the disciplinary sectors

3.2.1. The passive approach and the 'Swayze Effect': virtual reality cinema with an invisible interaction

The first 'passive' approach suggests a virtual experience that is much like watching a film but with a 360-degree view that immerses the viewers in the

very same scene of the story and takes them throughout the narration by using a panoramic perspective (which can be either internal or external). Users can also have an avatar through which they are able to move within the virtual environment and observe in detail all the scenes displayed. In this particular case, the viewers can experience the so called 'Swayze Effect' that "describes the sensation of having no tangible relationship with [the] surroundings despite feeling present in the [virtual] world" (Burdette, 2015). This phenomenon is named after the actor Patrick Swayze's role in the well-known film *Ghost* (1990) where he in fact plays the part of a ghost who struggles to be acknowledged from the other characters and the environment itself. It is a downside that could occur with the passive virtual reality storytelling approach since the viewer can see but it is prevented from interacting with the virtual dimension. In order to avoid the Swayze effect, it is fundamental to render the narration inclusive through the 'correction' of the virtual characters' behaviour so that they acknowledge the presence of the viewer. A way to achieve this inclusion is by addressing the characters' gaze to the spectator combining it with an approaching movement. For instance, in the cosmic documentary *A New Dawn* the viewer is introduced to first-hand space exploration carried out by Nasa's new generation of astronauts such as Jessica Meir, Jeanette Epps, Victor Glover.

Figure 3 – cosmonaut Micheal Grenhart on a space exploration vehicle

In a specific scene (see figure 3), the viewer finds him/herself into a space exploration vehicle seated next to the cosmonaut Micheal Grenhart who is driving it and at the same time explaining to the spectator the objective of the exploration while occasionally directing his gaze towards him/her. Similarly, in the second episode of the *Space Explorers* series, *Taking Flight,* several rocket launches are displayed from inside the space shuttle as in the case of the departure for the International Space Station of the Russian cosmonaut Alexander Misurkin who looks and speaks at the viewer as though he/she were an astronaut him/herself. The 'look at' behaviour on the character's part is essential to establish powerful relationships between the viewer, the narrative and the environment in order to combine the spectator's feeling of presence with the virtual storytelling. Through this act of acknowledgement, the gaps between the viewer, the story and the action are filled, and more importantly the 'Swayze Effect' can finally disappear.

The passive approach based on the viewer's observational engagement in the virtual story, presenting a low level of interaction with the virtual environment, is typically adopted in virtual reality cinematic pieces and storytelling.

3.2.1.1. Cinematic virtual reality: observational engagement

> The emerging consensus is that the term [Cinematic Virtual Reality] refers to a type of immersive VR experience where individual users can look around synthetic worlds in 360°, often with stereoscopic views, and hear spatialised audio specifically designed to reinforce the veracity of the virtual environment […]. Unlike traditional VR in which the virtual world is typically generated through graphics processing and audio triggers in real-time, CVR uses pre-rendered picture and sound elements exclusively. This means that the quality of these assets can approach that found in high-end television or feature film. (Mateer 2017, p. 15)

According to Mateer, who introduced the term CVR, this kind of immersive experience is a new type of filmmaking closely related to traditional cinema, yet different from popular virtual reality products insofar as interactivity and agency are tackled. While in standard VR the user is allowed freedom of movement to explore the virtual environment, in CVR there is possibility of choosing and shifting perspective (especially through chair rotation and head turning) rather than concretely acting and having an impact on the virtual world. Since the user interaction with characters and setting is prevented, the engagement in the cinematic experience lies at an observational level as it occurs with traditional cinema. Therefore, virtual reality cinema can be placed halfway between traditional cinema and pure virtual reality for it conceives the VR user as a viewer like in conventional cinema, but it displays 360-degrees scenes and spaces like in VR, yet it does not allow a high degree of interaction as it might happen with VR games. Considering the parallel between CVR and traditional cinema, there are some common aspects that should be taken into account when developing a narration such as the formulation of a specific interpretation of the story; the definition of the underlying theme and message; the modalities of information delivery (if the viewers have preliminary knowledge about what they are presented or not; if they learn as the characters do or are provided with less pieces of information than the characters); the definition of the objectives and features of the characters and the decision on whether to display the creative production choices or not (p. 18). These aspects should be also considered in CVR but with a different implementation since virtual reality relies on 360-degrees real-time experiences. In fact, although it is useful to build such comparisons and it is tempting to project traditional cinema on virtual reality as it occurred, in turn, with theatre and cinema, VR cinema needs a place and recognition for itself on par with the other existing media.

> What we felt was that virtual reality was being treated as a tech innovation. The way it is written about and exhibited is always in tech terms. […] Virtual reality is a new form of storytelling and art and it

needs to be recognised in the same way that film is recognised. (Rosenthal, 2019)

The majority of virtual reality cinematic pieces are configured upon equirectangular stereoscopic images that are looked at by the viewer from a fixed or semi-fixed position providing him/her with a panoramic experience. As for the spectators, unlike traditional cinema, in virtual reality they take control of the camera and can look in any given direction for the narrative is frameless. Their perspective can be double: from an internal POV, they find themselves within the narration as part of the scene and possibly embodying a specific character, while the second POV is represented by a third person perspective whereby the viewers are outside the narration as though they were observers. With the first-person POV, the user normally has a body in the form of an avatar but, since it requires a certain degree of movement control, hence a high level of interaction with the virtual environment, it is generally used in active experiences such as the artwork *Rising* by Marina Abramovic where the user has virtual hands and legs and is able to interact with the artist. Considering that with a low level of interaction there is no possibility to realistically control the virtual body, VR cinema generally avoids the use of the first-person POV in favour of the third-person POV in order to prevent the user from disrupting the feeling of immersion and presence, while still claiming ownership of the space insofar as the interaction with the virtual environment is concerned. However, as explained in the previous section, innovative cinematic experiences such as those presented in the Space Explorers Series prioritise the first-person approach by introducing story characters who directly address the viewer as if he/she were present within the narrative. When dealing with this inclusive and involving perspective in cinematic virtual reality storytelling, it is fundamental to consider both *technical and narrative immersion* (Pillai and Verma 2019, p. 2): the former focuses on perceptual cues (such as visual and audio elements) to orient and engage the viewers, the latter instead signals the story content and structure, as well as its impact on the spectators. Narrative immersion also comprises the spatial and temporal setting of the virtual reality environment, "In VR, the space is the

story. Spaces are pregnant with sensory detail, ideas, behaviors, and narrative possibility" (Damiani, 2017b); the film genre (for instance, the case studies examined in this dissertation refer to the documentary genre) and the features inherent to it (for example, an important technique of documentary films is the use of interviews that allow viewers to listen and look at those directly involved); the story focus (in the specific cinematic VR pieces examined the focus is on the racial segregation on the one hand and on space explorations on the other); the characters' actions; the viewers' involvement within the narration and the possible feelings elicited (which can vary according to the experience presented: in the case of the *Space Explorers Series* the feelings provoked are of excitement and curiosity, while in *Traveling While Black* the emotions that might arise are empathetic and compassionate). If narrative immersion is efficaciously achieved in CVR, then the viewer might feel completely transported by the experience suspending his/her own disbelief. This kind of deep engagement has been originally associated with the transportation theory in written works whereby the readers might feel a sense of total absorption into the narrative presented as if they were travellers who distance themselves from their homeland to explore new realms and even get lost:

> Someone ('the traveler') is transported, by some means of transportation, as a result of performing certain actions. The traveler goes some distance from his or her world of origin, which makes some aspects of the world of origin inaccessible. The traveler returns to the world of origin, somewhat changed by the journey. (Gerrig 1993, pp. 10-11)

Considering Gerrig's paradigm of travel as transportation, the reader may access the inaccessible in the explored narrative dimension, detaching from the real world. This transportation theory has not only been applied to written material but also to other media, such as cinema, and considered as an 'absorption into a story [which] entails imagery, affect, and attentional focus […] to the extent that individuals are transported into a narrative world' and

also a 'distinct mental process, an integrative melding of attention, imagery and feelings' in which viewers 'may be less aware of real-world facts that contradict assertions made in the narrative' and 'may be experience strong emotions […] even when they know the events in the story are not real' (Green and Brock 2000, pp. 701-702). Transportation may lead the viewer to the suspension of disbelief, which in virtual terms is translated to the feeling of presence, that is, of being physically and psychologically tied to the virtual world as if it were the only existing. Considering the lack of interactivity with the virtual world and characters, presence in cinematic virtual reality is based on 'simulating real world perceptions. You know you are 'there' because sounds and images in the virtual world respond like the real world to your head movements' (pp. 263-264), hence the user's observational engagement needs to be facilitated by clear rules of viewpoint shifting, virtual navigation without distracting visual elements and slow transitions between shot cuts. Therefore, although CVR is not able to provide the user with a high level of interactivity with the virtual environment, it still can immerse the viewers through strategical technical and narrative choices (such as the lighting, the spatial audio, the level of detail, the narrator's voice) that enhance the attentional cues and prevent them from missing the focal points of the plot.

3.2.2. The active approach: virtual reality art with a medium level of interaction

The active modality of virtual reality storytelling is usually a prerogative of VR games since their very nature is inherently interactive and it stands for the modality that is most user-centred because of its demand for participation and agency. However, the participatory and interactive mode has recently started to be employed in the field of visual arts, as well. Normally, with this approach users are provided with an avatar able to project their physical movements in the virtual world (technically done through the use of controllers and headsets, thus with eye- and hand-tracking technology). There can even be multiple users within the same experience who see and interact with each other and also alternative options that like hyperlinks allow the experiencers to teleport

or modify the unfolding of the story. For instance, in the artwork *It Will End In Stars*, when the users find themselves in the wolf's hut, they are invited to tap objects that transport them into different unexplored spaces. One of the objects is represented by the miniature of a naked female sculpture locked in a cage that, once touched, allows the users to navigate into a new dimension where proportions are reversed, and they turn into a minuscule figure, which is confronted by the uncanny female sculpture now gigantic (see figure 4). It is important, however, to avoid an excessive number of variants and endings on a storyline so that the user does not feel disoriented and overwhelmed.

Figure 4 – female sculptural figure in It Will End in Stars

The active approach to virtual reality storytelling only allows the first-person point of view through which the narrative is directly addressed to the user as if he/she were a character within the virtual environment who can in fact influence other characters and, in general, the plot development. This participatory concept is the tenet of the immersive experience based on the users' agency and interaction through the use of an inside perspective that conceives them as part of the narrative:

the suggestion of being inside that comes with the idea of the immersive has resonances with the experience of being able to take action within the work, and with the changed point of view that is gained through the experience that I suggest are the special characteristics of audience participation. To be inside the work, not just inside its physical and temporal space but inside it as an aesthetic, affective, phenomenological entity gives a different aspect to the idea of a point of view, and of action. (White 2013, pp 16-17)

The user's interaction with the narrative elements and characters of the virtual experience is built thanks to an interplay of viewpoints and actions, which contribute to the definition of the artwork through the decisions that are made. For example, in *Rising* the users are able to interact with Marina Abramovic's avatar imprisoned in a glass cage filling with water and are requested to make an ethical choice on whether to save the artist from drowning.
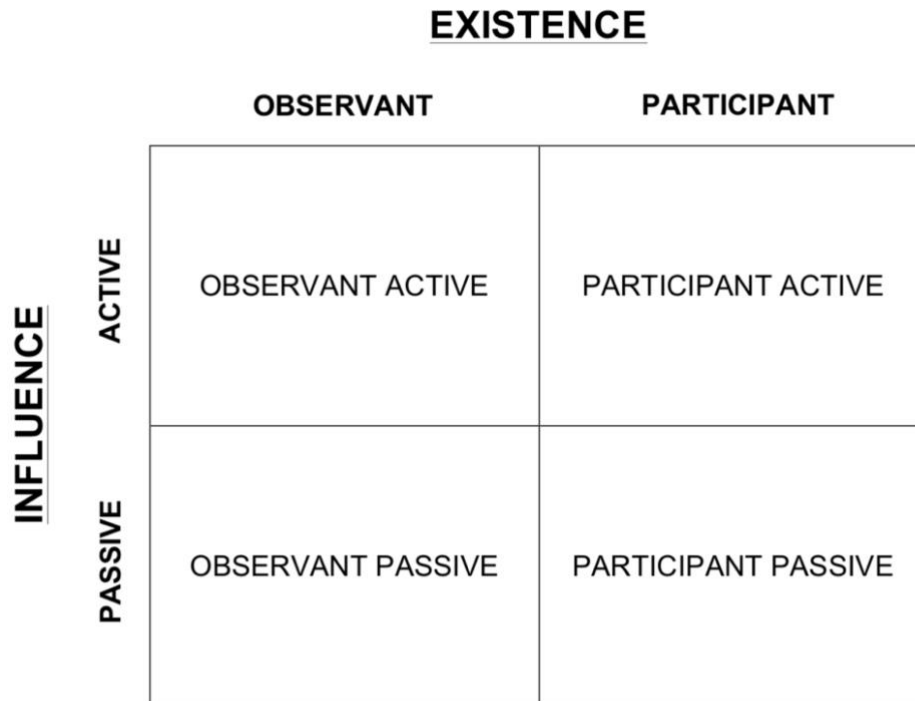

Figure 5 – Marina Abramovic's avatar in Rising

They in fact are able to freely move throughout the virtual environment since they find themselves outside the cage, which they can approach and touch. In particular, moving closer to the cage, the users can establish contact with the artist and see her in detail while listening to her request for aid.

Several scholars consider the active approach as the only remarkable type of virtual reality storytelling since it allows participants to physically interact with the characters, objects and the environment presented in the virtual world, conversely they disregard 360-degree videos (proposed in cinematic virtual reality) for they do not entail active engagement (Lanier, 2017). However, the active participation of the users requires them to be advanced experiencers able to process the entirety of the virtual world in order to create a deeper bond with the story that is presented and interact with it. Therefore, it is important for the user to be conscious of what he/she is about to experience, and for the storyteller to provide the user with the right keys to understand the virtual narrative. To truly grasp the difference between active and passive virtual reality, it is fundamental to make a clear-cut distinction between the user who assumes the role of an influencer on the fictitious world and the viewer who instead just exists and is engaged in the virtual dimension as an observant (see figure 6). If the experiencers are defined as observants, then the narrative unfolds before them without any sort of concrete interaction. However, there is a slight difference between the active and passive observant, which corresponds to the given POV: the former is provided with a first-person point of view, hence the viewers are able to engage in the narrative as though they were real characters partaking in the same events in which the other virtual characters are involved (this is the case of the *Space Explorers Series* or *Traveling While Black*); conversely, the latter is characterised by a third-person POV that places viewers as traditional spectators without any kind of influence on the story. On the contrary, if the active approach is adopted, the experiencers become users/participants who can actually interact with the story and the characters and they can either decide how to explore the virtual world (this refers to the passive participant and it can be signaled in *It Will End in Stars* where the user chooses where to

teleport him/herself) or how to influence the development of the narrative (this is the case of the active participant who is asked to take action. E.g. *Rising*).

EXISTENCE

	OBSERVANT	PARTICIPANT
ACTIVE	OBSERVANT ACTIVE	PARTICIPANT ACTIVE
PASSIVE	OBSERVANT PASSIVE	PARTICIPANT PASSIVE

Observant vs. Participant: Defined by existence within the virtual world
Active vs. Passive: Defined by interactive influence with the story

Figure 6

With virtual reality, especially when taking into account the active approach, there is the transition from the 'teller-listener' paradigm where 'the power in the relationship lies primarily with the former, with the latter having little agency in the exchange' (Nelson, 2016) to the 'builder-participator' paradigm where the experiencer becomes an actual contributor to the narrative. This active and interactive modality is generally adopted by artists in virtual reality to explore the relationship between art, technology and users and the involved implications of using such an innovative and immersive medium to deliver their artistic products.

3.2.2.1. Virtual reality art

Intersection between art and technologies is not unfamiliar to the public, however virtual reality art installations are still an almost unexplored territory in continuous evolution and maturation. They allow artists to create VR immersive content with both an aesthetic and socially critical perspective transforming it into a new art form, as VR director and designer Michel Reilhac claims:

> I feel incredibly fortunate that once again in my lifetime I can experience the birth of a new artform. I experienced it in the early eighties when I was a dancer, when contemporary dance really invented itself, and it was an incredibly exciting moment. Now, it's happening again with virtual reality storytelling. (Reilhac, 2019)

Being an extremely new field for visual arts, virtual reality art is often considered tantamount to cinema, gaming or edutainment (educational entertainment) for it is believed that it can be recreated by any other conventional media. On the contrary, virtual reality art is concerned either with reflection and criticism on specific societal or cultural aspects or with the potential, as well as the constraints, of the digital medium itself. What it shares with videogames is the interactive approach that allows artists to manipulate the virtual space and at the same time it provides users with a freedom of movement across six degrees, including not only an approaching action towards the elements within the virtual environment but also the modification of it:

> We are now at that point where this interactivity makes these experiences very realistic and engaging in the sense that the audience truly becomes an active part of the story world. (Reilhac, 2019)

However, education on immersive media is fundamental in order to eradicate the common misconception on virtual reality as a mere form of

entertainment. Although virtual reality is still in its infancy and there are some downsides to this technology – the motion sickness problem (as it may happen with *Lunatick* and its zero gravity lunar landscape or *Rising* and its ice melting scenery), the audience's demand, which is still tied to the gaming market, and the difficulty to access VR artworks without possessing a pricey visor – there are several art centres and studios, such as the Julia Stoscheck Collection in Berlin, the Phi Centre in Montreal, and Acute Art in London, which are opening their gates to this new art form. As Phi's PR director Myriam Achard points out, 'new technologies are now an integral part of the artistic practice' (2019) and, contrary to cinematic virtual reality, art uses this immersive technology in a conceptual way rather than introducing a linear story allowing artists to present their works several times, reiterating them at different places and to a broader audience that can partake in the experiences repeatedly and endlessly by just having a VR headset at their disposal. This infinite reproduction references back to the sixties when the revolutionary narrative of seriality in art became widespread in the United States fostering the idea that artistic pieces could be repeated across time defying the concept of a single, unique and irreplicable work of art. As far as this reiterating process is concerned, the Phi Centre has and continues to promote the PHI VR TO GO initiative launched during the COVID-19 pandemic that tries to keep encouraging virtual reality art - not in museums as it is not possible - but by adopting a domestic idea and bringing it into people's homes, so that they can take their time and space to enjoy the different artistic experiences in a more familiar way. Along with the interactive and active approach art normally embraces when employing virtual reality, there is another peculiar factor that it promotes thanks to this creative medium, that is, empathy. Building empathetic feelings and presenting shared experiences is crucial for the artistic field, and virtual reality represents one of the most suitable options in this sense, because it explores embodiment and the concept of identity. That is the case of Marina Abramovic's *Rising* that tries to elicit users' empathy by engaging them in a first-person dilemma that involves themselves, the artist and the planet. The moral dilemma concerns not just the artwork itself, but the ethics of embodiment in general. If it is true that virtual reality induces

immersivity and empathetic feelings by generating an embodied experience, to what extent can art pieces decide the subjects of personification and the narratives to portray? As Popat holds:

> [T]here is an inherent moral dilemma in VR's embodied experience of presence/absence, combined with the ability to do the undoable, which could be taken to extremes alarmingly quickly and easily. (Popat 2016, p.378)

It is crucial to distinguish the line between the virtual body and the physical body insofar as experiences that introduce a diverse perspective, or an extreme scenario are considered – that could be the case of Jennifer Haley's 2015 artwork, which displays a pedophile's virtual environment. If the body is not entailed, the users control the scene through their gaze, which allows them to explore the art installation, as it happens in almost all the art case studies – except for *Rising,* which employs hand controllers: if participants want to draw close to a particular spot or object, they will do it by pointing at the desire direction through their eyes as it occurs in *Lunatick* and *Into Yourself*, *Fall*; in It Will End In Stars the users' gaze is even more powerful in the sense that it allows them to navigate from one virtual world to another through teletransportation. Whether the movements in the digital world respond to the experiencer's body or gaze, the interactional aspect seems fundamental when it comes to virtual reality art experiences due also to the 360-degree nature of the medium that conveys tridimensionality to the art space and prompts users to interact with it. As pointed out in cinematic virtual reality pieces in the previous section, the balance between doing and being, namely action vs reflection (Atherton and Wang 2020), is tantamount to the artistic experience itself validating it as a truly immersive work. Action is strongly tied to the interactive approach and the adventurous storytelling mode normally present in videogames, 'which tend[s] to focus on doing: moving, attacking enemies, achieving goals' (p. 12), and it is especially emphasised when the activity includes something impossible or highly unfamiliar in the real world that is made possible in the virtual dimension (flight,

teletransportation, lack of bodily presence). The active element should be compensated and complemented by the aspect of being, that is, 'existing in an environment, absorbing the sights and sounds and finding one's place in the virtual world' (p. 11), which prompts users to undertake an introspective and reflective journey, as well as the processing of emotions, hence the moments of exploration of the art space and embodiment into an alien condition. The combination of action and reflection confers to the artwork narrative coherence while also purporting to show the aesthetic value of the piece itself (Ryan, 1999).

3.2.3. The mixed approach and the multisensory experience: virtual reality theatre with a high level of interaction

There is yet another level of interaction, which requires the user to act both in the physical and virtual world, and it corresponds to the ultimate degree of agency related to the theatrical experience. In this sense, virtual reality can be regarded as the utmost theatrical performance where the fourth wall disappears. Indeed, according to Oculus' Story Studio's producer, Edward Saatchi (2019), one of the three pillars of virtual reality is immersive theatre (the other two being narrative gaming and cinema). Theatre, however, can boost the interactive potential in a way that cinema is not allowed to for its very nature because it entails a liminal space where reality and virtuality confound:

> Theatre has always been a space of virtuality. The action on the stage exists as neither what it is actually nor what it is pretending to be; instead, it bridges the actual and the imaginary to create a virtual world in which performers and viewers are complicit. (Popat 2016, p. 357)

The complicity that is created between the participants and the actors conflates in a dual and parallel dimension represented by both the real and the digital. On the user's part it is a very demanding act of interaction since

the narration is presented through multiple intersecting layers, thus he/she is requested to be familiar with the concept of immersive virtual reality theatre. On the one hand, there is the experiencers' participation in the real-world, where they are encouraged to interact with the actors of the performance space; on the other, the participants need to be receptive to the theatrical virtual piece using almost all the senses. Indeed, this represents the utmost interactive stage because not only introduces visual and audio cues, but it also employs the sense of touch that is stimulated by the actors themselves who first start interacting with the users through communicative acts (for instance opening a dialogue with them), and then make physical contact with them during the virtual experience. The haptic element enhances the users' feeling of presence, co-presence (with the actors) and immersion within the theatrical virtual piece. Co-presence, the idea of being immersed in the virtual experience together with the performers is a true novelty:

> VR affords, even invites experimentation with the doing of the culturally or physically undoable through the suspension of 'real'-world sociocultural norms and rules. The critical factor is that the undoable remains undoable: you both know that the touch will not occur in any physical sense, even though you enact touching and perhaps also being touched. So the norms can be safely suspended by (usually tacit) agreement among participants. (Popat 2016, p. 373)

It is as if the social taboo of physically touching someone who represents a stranger were removed from the virtual experience. The complicity between spectators and performers lies in this fidelity pact whereby the users may attempt to touch the actors experiencing a sort of anticipation of making contact with them, while the actors, who become the virtual and physical 'Other' (p. 377), can actually interact with users by employing the sense of touch, which is transferred from the physical dimension to the virtual environment.

Being aware of the VR medium's largest advantage; that the fourth wall is non-existent, allows the creator to involve their audience from a first-person perspective, making the viewer/participant feel as if the story revolves solely around them. Working not only with sight and sound, but incorporating the entire body, allows the audience to position their entire self much more within your piece, having a greater and everlasting effect on them. (Ungermand and Engermann 2019, p. 40)

3.2.3.1. Virtual reality immersive theatre

In traditional immersive theatre, audience members are conceived not just as mere spectators, but they are allowed to access the stage, which is not marked by a limited space and a definite distinction between actors and viewers. In virtual reality theatrical experiences, it is entailed a binary sense of embodiment provided by both the property of immersive theatre where audience members are invited to establish a connection with the physical space, and the quality of virtual reality, which leads participants to the feeling of presence when in fact there is a lack of bodily agency. With VR theatre the digital layer is added so that participants can experience the physicality of real settings and performers and at the same time the virtuality of a parallel 360-degree dimension. On the one hand, there is the interpersonal communication happening in the real world, on the other there is the action and participation taking place in the virtual realm. In the case of theatre, the sense of embodiment is much more intense than in virtual reality cinematic and artistic pieces due to the fact that there is a synchronicity of absence and presence of the bodily dimension: absence because users are immersed in the virtual landscape and act within it through their avatar and, at the same time, presence because performers physically interact with them, thus their movements are concretely felt by participants. Contrary to what some scholars argue (Machon, 2012), there is not a complete detachment from the real world and the body, instead, the connection with both the physical and the virtual is made possible either simultaneously or asynchronously. The link to the bodily dimension and the feeling of presence across the two levels of interaction is

materialised by the perceptual cues that help to stimulate users' senses so that they react and act throughout a double narrative. The sense of touch is what truly contributes to the construction of an immersive and all-encompassing virtual environment and it is achieved thanks to the role of the theatrical performers who represent the junction point between the two worlds. The participants find themselves before a multisensory theatrical piece that challenges traditional storytelling convention. For instance, in *Believe Your Eyes* (see figure 7) the narrative develops itself through a non-chronological double narrative thread based on the trope of reality vs dream (which often stands for a nightmarish journey) blurring the lines between the physical and the digital.

Figure 7 – physical setting of Believe Your Eyes transposed to the beginning of the virtual experience

Indeed, the theatrical piece proposes live-action virtual reality film and at the same time physical performer interaction in a continuous interplay between real and virtual. Although the users are isolated by the VR headset, they are always reminded of what is happening outside, which effectively mingles with the virtual immersion: from hearing the performers' movements and footsteps to the very apex of the theatrical experience when they are actually touched by the actors. Other effects are added to recreate the ghostly atmosphere, such as intermittent cold streams that can provoke shivers to the participants. Again, a physical reaction is incited by both the real world with the use of particular props and effects and the virtual dimension with the narration of a

nightmare through the voice and presence of a trembling woman who seems extremely frightened as well. In immersive theatre, the mixed approach is adopted at various degrees: the space, which allows freedom of movement to the experiencers who are in fact able to wander throughout the physical and virtual environment; the scenography, which is characterised by anticipatory elements, the virtual piece itself that evokes both the theatrical setting and the place where the story occurs; the narrative, which is not presented through a chronological order of events, but rather prompts the participants to engage with it by adopting an impressionistic and emotional approach.

Having examined the domains of cinema, art and theatre according to their different virtual reality storytelling approaches, it emerges that the narratives presented are marked by a hybrid quality due to the disciplinary intersection between humanities and technology. In order to fully understand what the hybrid medium of virtual reality stands for and how it can impact the audiences, it is necessary to retrace its origins and its major features with special attention to the user experience (UX) following the character-centered narrative pattern that is considered to be the most suitable for VR experiences, regardless of the disciplinary sector concerned. The different storytelling modes combined with the user experience contribute to the construction of the complex, intersectional, and hybrid framework characterising the field of virtual reality.

4. An overview of Virtual Reality: history and components

In order to continue with the exploration of virtual reality as a storytelling medium, it is fundamental to go through the creation and evolution of this technology as such and its defining characteristics since they are part of the user experience of narration itself.

4.1. An Overview

The first appearance of a virtual reality device (see figure 8) is to be found in the 1960s when the American computer scientist Ivan Sutherland created the 1968 3D head-mounted display system and coined the concept of VR, which consists of a perspective image that changes as the user moves (Sutherland 1968, p. 757). According to him, the three-dimensional display should become a window to a world that yet looks "real, feel(s) real and respond(s) realistically to the viewer's actions" (Sutherland 1965, p 506).
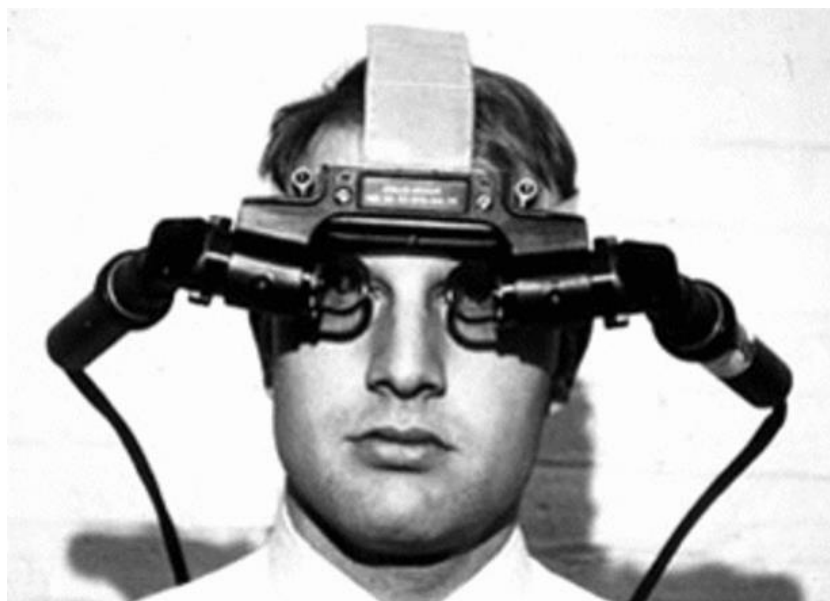

Figure 8 - The first head-mounted three-dimensional display

Although Sutherland's device, called the Sword of Damocles due to its impending weight on the user's head, was basic and quite unrealistic in terms of graphic and interface, it led to significant studies towards more sophisticated applications of it. As a matter of fact, from that moment on research in the VR field produced other devices based on head-mounted displays, such as VCASS (1982), the Visually Coupled Airborne Systems Simulator, that is, a flight simulator, and the VIVED, the Virtual Visual Environment Display, created two years later. The very turning point was in the mid-eighties when the VPL, Visual Programming Languages, presented the well-known DataGlove (1985) and EyePhone HMD (Head-Mounted Display - 1988), which were major achievements in the field of virtual reality because they were used as hand- and head-trackers, and also because they were the first VR devices available on the market (see figure 9). Nonetheless, these early headsets were still heavy, expensive, and provided with cables and wires that restrained the possibility of action. Moreover, image quality was still poor and did not generate a truly immersive feeling on the viewer's part.

Figure 9 – EyePhone HMD woth Dataglove

From the 2010s onwards, there was a real breakthrough with regard to a series of ergonomic aspects that HMDs implemented: in fact, they became much lighter, hence more comfortable and easier to put on. They also became less expensive (although even today they are still not affordable to anyone) and wireless, thus allowing much more freedom of movement. Today, the most popular and commercially available virtual reality devices are equipped with a visor, that is, an HMD, and controllers. Since the acquisition by Facebook, Oculus has become one of the most famous brands in terms of virtual reality headset production and design and in the last few years has released different headset lines such as the Oculus Rift (figure 10) and the Oculus Quest. The other most known VR device is the HTC Vive (figure 11) produced by the Valve Corporation in collaboration with HTC.

Figure 10 – Oculus Rift

Figure 11 – HTC Vive

Both Oculus and Vive devices come with a headset and a pair of wireless controllers, and they are provided with tracking technology, hence no wires are needed. Input devices, such as the joysticks or gloves, detect hand movements and track the user's actions translating them from the real world to the virtual one. Output devices are instead the headsets, which are considered the most immersive tools allowing viewers to see, hear and touch everything that occurs in the virtual dimension. Moreover, Oculus and Vive visors have become increasingly lighter and user friendly to provide the viewer with a more pleasant and realistic experience. In particular, these two specific headsets were used as the VR devices for the case studies that will be analysed later in light of their different modes of storytelling. Along with the

creation of several HMD virtual reality devices and the increasing understanding of its functioning, the composite research that was carried out from the late eighties – early nineties led also to the rise of several other definitions of VR. For instance, Bishop and Fuchs suggested that virtual reality, or virtual environments (VE) as they called it, refers to "real-time interactive graphics with 3D models, combined with a display technology that gives the user the immersion in the model world and direct manipulation" (1992, p. 2). In the previous description it is important to pinpoint two keywords that are at the core of the VR experiences and that will be developed in the following paragraphs*: interactive graphics* and *immersion*. Indeed, other scholars emphasised these two aspects, defining virtual reality as:

> The **illusion of participation** in a synthetic environment rather than external observation of such an environment. VR relies on a three-dimensional, stereoscopic head-tracker displays, hand/body tracking and binaural sound. VR is an **immersive**, multi-sensory experience. (Gigante 1993, p. 9)

> **Immersive, interactive**, multi-sensory, viewer-centered, three-dimensional computer-generated environments and the combination of technologies required to build these environments. (Nelson, Cook and Cruz-Neira 1999, p. 45)

Therefore, immersivity and interactivity are the two main elements highlighted by most scholars when dealing with virtual environments and this is extremely important to understand how the narratives that artists and storytellers want to convey are articulated through these features as a key strength of narration.

4.2. User Experience and *Experiential Fidelity*

User experience (UX) is fundamental to understand how to adapt VR storytelling to viewers to create environments that are believable for they

reach high levels of realism. In the case of virtual reality, the viewers are also experiencers since they not only look and listen to what is being displayed and narrated, but they also live the experience. In order to provide the user with an experience that feels genuine and authentic, a variety of visual and audio (and to certain extent also haptic) stimuli are introduced as part of the virtual narration, which has to maintain the integrity of the storyteller's world as if there were a 'fidelity contract' with the user:

> The goal of virtual reality is not to create a photorealistic environment. It is to uphold the contract with the user that things are consistent with the experience of the real world. Users have to believe they are seeing things in a place that could exist and that the interaction with that place makes sense. (Dang, 2019)

Beckhaus and Lindeman (2009) propose the notion of 'experiential fidelity' to define the perfect combination and alignment between the user experience and the VR piece created by the storyteller so that the viewers believe to what they see and participate in while exonerating from the physical world. The challenge for VR storytellers and creators is to build a completely non-mediated environment that attracts the user by stimulating multiple senses and enhancing perceptual cues with special regard to the introduction of interactive content. Therefore, it is not just a matter of physical stimuli (visual, audio and haptic) but also of perceptual aspects that have an impact on the users' cognitive level and their *anticipation, expectation*, and *attitude* of the virtual experience (p.188). The first fundamental perceptual element that might help the viewers to familiarise with what they are going to see, and especially to immerse them in the virtual environment is the anticipation of certain aspects, such as the setting, in the real world so that a pre-experience is created to enhance the virtual narration. Anticipation, in fact, can become an integral part of the virtual reality storytelling language since 'immersive stories demand a moment for audiences to acclimate to a space before the story starts' (Damiani, 2017b). In Abramovic's *Rising* the scenography is

structured around the element of water to recall the ocean and specifically to anticipate the theme of the experience, that is, the global sea levels rise.

Figure 12 - watery setting for Marina Abramović's Rising at Gallerie Ca' Rezzonico (Venice)

The pre-experience of *Rising* attempts to recreate users' immersion in the watery virtual setting and at the same time their feeling of imprisonment (which is also mirrored by the condition of the artist's avatar caged in a box increasingly filled with water) and overwhelming for a situation that seems to prevent them from escaping. Another instance of *anticipation* is provided by the theatrical experience *Believe Your Eyes* (see figure 13) where the virtual piece is prefaced by the performance of an actor who users believe to be only a member of the museum staff, hence they do not realise this precise moment belongs to the experience as well. While the actor escorts the visitors to another room where the virtual installation is placed, she speaks to them by asking some questions about their sleep quality, anticipating the narration of the piece based on both a dream-like and nightmarish quality. At the end of the conversation, the actor shows users a reddish room wrapped in long heavy burgundy curtains reminiscent of those used in theatres. In this case,

the anticipation is double for it refers both to the visual and oral properties of narration. In the pre-experience the visitors receive hints at what they are going to be presented but do not fully grasp the meaning and the underlying theme until the very end of the piece when another actor appears in the physical world, outside the museum, playing the role of a passer-by tourist asking for directions and bewildering them with the final line 'believe in your dreams'.

Figure 13 - Theatrical setting of Punchdrunk's Believe Your Eyes

In both the aforementioned experiences, the anticipation moment provides users with preliminary aspects (the element of water in the former, the theatrical and dream-like setting in the latter) that help them to fill in the gaps and make meaning out of what they have just seen so that 'the extent to which a person is able to fill in gaps in perception is related to the amount and richness of previous material from which to draw' (p. 189). Apart from anticipation, there are other two features that relate exclusively to users themselves, namely *expectation* and *attitude*, which are obviously influenced by the pre-experience of the VR piece. If anticipation refers to what is presented and hinted at through the physical setting before the virtual

experience itself, expectation is what the participant indeed expects from the immersive piece, which can either correspond to the pre-experience's allusions or be completely detached from it. In the best-case scenario, the internal expectation aligns with the external anticipation and, through this interplay of inside/outside perspectives, the so-called fidelity contract starts concretising. Based on this alignment between the user experience and the generated virtual reality environment, Beckhaus and Lindeman identified four components that may increase the expectational level of users and impact on their attitude towards the experience itself: the first element refers to the capacity of VR narration to elicit *strong emotions* on the viewer's part who may be able to empathise with the virtual characters and surroundings (see the section about the sense of embodiment); the second aspect is related to the potential of *deep engagement* that users may experience especially when they play an active part in the virtual narration and can contribute to the development of the story by interacting with certain elements or characters of the virtual dimension (see section on interactivity); the third key component concerns the *massive stimulation* of the senses of users allowing them to feel completely immersed and present within the virtual landscape (see section on immersivity and presence); eventually, the last concept under analysis refers to the escape from reality and, indeed, users prefer to be removed from the physical surrounding reality to enter another dimension, the virtual one, hence the creation of surreal and escapist narratives. Therefore, it is fundamental to provide users with interpretative keys and clues about the virtual experience, which has to be believable rather than focusing on the generation of a completely realistic environment, so that they are able to fill in the rest by using their imagination.

All the perceptual cues, including visual and auditory factors, which are connected to the specific features of virtual reality, from immersivity to binaural audio, are to varying degrees fundamental for the user experience and the logic of storytelling in virtual reality worlds.

4.2.1. Immersivity

Immersivity in virtual reality can be deemed the combination of video, sound and human-machine interaction, which allows the user to explore alternative worlds, that is, virtual landscapes. In practical terms, immersion stands for the number of sensory impressions that the user receives, that is, how many senses are stimulated, as well as the level of interaction between the viewer and the technology employed and the degree of reality within the virtual environment. Needless to say, higher graphic resolution leads to better user experience, hence the sense to be stimulated first is the sight, which immediately plunges the viewer into a new realm. For this purpose, the best VR devices are the head mounted three-dimensional displays that provide the user with a stereoscopic view of the virtual landscape tracking his/her head position and movement. If the immersion is truly achieved through the VR experience, then the viewer is encouraged to suspend his/her own disbelief, which can be considered the main goal of a storyteller:

> The question isn't whether the created world is as real as the physical world, but whether the created world is real enough for you to suspend your disbelief for a period of time. This is the same mental shift that happens when you get wrapped up in a good novel or become absorbed in playing a computer game. (Pimentel and Texeira 1993, p. 15)

Indeed, through the immersive power of virtual reality artists aim to involve their public to such extent that viewers feel free to break all the constraints in order to fully experience what they are seeing:

> Through its immersive dimension, VR inaugurates a new relation between computers and art. Computers have always been interactive; but until now the power to create a sense of immersion was a

prerogative of art. VR constitutes in this respect an attempt to put art into computer design. (Ryan 1999, p.114)

The blending action between immersion and virtual reality creates a specific sensation on the viewer's part when engaging with a VR story and this is well summarised by the artist Laurie Anderson concerning her last VR work *To The Moon*:

Virtual reality is a combination of a lot of things: movement, physical engagement, language, music and most of all, being able to disappear into something. (Anderson, 2019)

This happens in immersive virtual reality stories when the physical boundaries are overcome and the user is immediately transported into a new dimension, which defies all the rules of everyday world, yet it defines itself as an environment specifically realistic. Indeed, the degree of realism coincides with that of the user's expectations about the virtual experience and the stimuli provoked, so if the reality expectation coincides with the VR environment, the experience will be consequently more realistic to the individual's eyes (Baños *et al.* 2000, p. 331). Technically speaking, immersive power is conveyed by means of positional tracking whereby the user's physical movements in the real world are mapped to his/her avatar's actions in the virtual realm, linking the human body directly with the virtual dimension. With the useful tool of the positionally tracked VR comes the downside of both lack of control over the camera on the VR designer's part and, at the same time, lack of freedom of movement on the user's part because the trackable space is of course limited. In order to overcome this restriction, the best position the user can take is at the centre of the virtual environment, that is, the virtual space should be aligned with the centre of the viewer's tracking volume in the real world, and this is concretely indicated through an illuminated circle that surrounds the user. While the aim of the virtual reality experience is to transport the viewer to another realm, it is fundamental to remember that his/her physical body

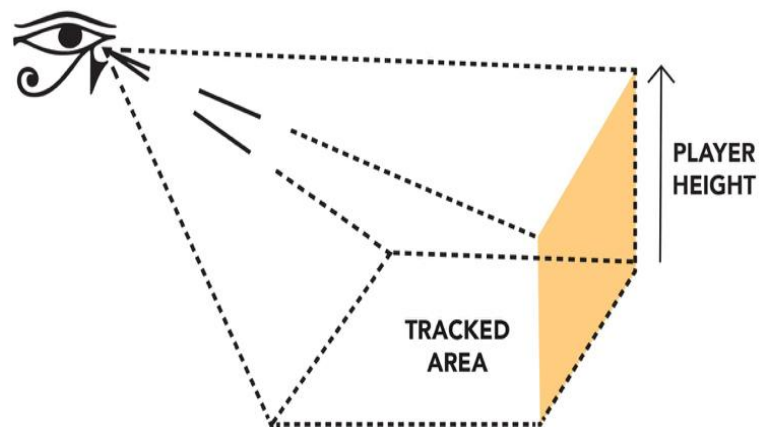remains relegated to the real world, which is represented by the positionally tracked VR (Ballantyne, 2016).

Figure 14 - VR Positional Tracking

In spite of the specific functionality of the positional tracking to convey immersivity, this characteristic aspect of the VR experience is intrinsically psychologic in the sense that it is a feeling created in the user's mind whenever is transported in the virtual dimension, hence it can be described as:

a psychological state characterized by perceiving oneself to be enveloped by, included in, and interacting with an environment that provides a continuous stream of stimuli and experiences. (Witmer and Singer 1998, p. 227)

Therefore, while immersion can be connected to the psychological sphere, there is another component that features in virtual reality, which instead can be deemed completely physical as a consequence of the feeling of immersion and it is presence.

4.2.2. Presence

Presence could be defined as the feeling of 'being there' in the virtual environment and it concerns the perception of physical presence and at the same time the interaction-reaction between human and machine:

> Presence is the sensation of being spatially and temporally located within a mediated experience. The sensation may be fleeting or it may continue for a longer duration. (Heeter 2000, p. 7)

This specific feeling, called also 'telepresence', is generated when the viewer's attention is absorbed to the point of being completely involved in the digital content, thus becoming engaged with the virtual realm:

> Telepresence is the extent to which one feels present in the mediated environment, rather than in the immediate physical environment (…). This can be either a temporally or spatially distant real environment (…), or an animated but non-existent virtual world synthesized by a computer. (Steuer, 1992, pp. 75-76)

However, the feeling of presence in virtual reality, although it has reached high levels of realism, provides a restrained representation of the human body's actions since the VR experience can only display an embodiment of the user, that is, an avatar, which clearly is "more constrained than a physical body in (its) range of expression and motion and means of control" (Heeter 2000, p. 8). Nevertheless there are various elements that can be checked in order to enhance the feeling of presence, such as: the aspects concerning the degree of realism within the virtual dimension, hence the more consistent with the real world the digital content is, the more realistic; then there are the sensory impressions whereby the more stimuli are provoked to the viewer's senses, the more he/she feels like being physically there; the control aspects are also essential since they can provide the individual with enough control over the virtual environment so that he/she is able to experience a greater sense of presence; eventually there are the distraction

factors, which depend on the level of isolation from the real world that the virtual reality device can guarantee to the viewer (Witmer and Singer 1998, pp. 228-230).

Presence is a fundamental element for virtual reality storytelling because it means that the viewer is bodily present in the very moment the story is enacted and this particular physical feeling connects with the so-called embodiment.

4.2.3. Embodiment

The sense of embodiment (SoE) – term introduced by Kilteni, Slater and Groten in "The Sense of Embodiment in Virtual Reality" – refers to the user's perception of his/her own virtual body representation as though it were in the real world and it is a specific condition inherent in the virtual environment. Therefore, it refers to:

> The ensemble of sensations that arise in conjunction with being inside, having, and controlling a body especially in relation to virtual reality applications. (Kilteni, Groten and Slater 2012, p. 374)

The SoE is constituted of three elements: the sense of self-location, the sense of agency, and the sense of body ownership. The first refers to the user's perception of being located within a physical body, which coincides to a determinate space, that is, the virtual space. The sense of agency, as the word indicates, concerns the user's act of controlling his/her own actions in the virtual dimension. The last component of the sense of embodiment signals the specific feeling the user has when possessing a virtual body, which becomes the origin of the experiences' impressions (Kilteni, Groten and Slater 2012, pp. 375-377).

Josephine Machon (2012) holds that VR has a distancing quality that provokes a desire of disembodiment on the user's part. However, in virtual

reality environments the feature of embodiment can be used as a primary source for the creation of empathy by shifting the user's perspective:

> The nature of action in virtual worlds is such that our bodies are both present and absent, experiencing agency and aspects of sensation even though there is no direct contact between flesh and world. How do we approach the nature of embodied experience in VR when anything can be done, but the body is apparently missing? It becomes possible to explore impossible situations and experiences through the eyes of others. (Popat 2016, p. 359)

Indeed, it is 'through the eyes of others' that the viewer is compelled to project him/herself into someone else's condition. For instance, in Marina Abramović's *Rising* the user is projected into a man of the future during a global climate disaster where he/she is faced with the imminent disintegration of an iceberg, while in Roger Ross Williams' *Traveling While Black* the viewer becomes a member of the African American community in the 50s during the segregation period and has to cope with the limitations imposed to black people on travels across the country. In both cases there is a change of viewpoint created through the embodiment technique that attempts to elicit empathetic feelings towards the condition embodied by means of projection or identification. In this sense, the user's body is relegated to a liminal dimension whereby he/she is neither completely in the physical world nor fully in the virtual world, which can be deemed a sort of dual unity (Google News Lab 2017, p. 10).

The ultimate goal of the sense of embodiment is the user's interaction with his/her own virtual body, as well as the relationship with the virtual landscape.

4.2.4. Interactivity

Interactivity translates itself into the capacity the user has to freely explore the virtual scene and the degree to which he/she can modify the landscape. More importantly, the interactive quality of VR allows the user to be not only a mere spectator but also a character partaking of the virtual action:

> Users are like audience members who are able to have a greater influence on the unfolding of the action than simply the fine-tuning provided by conventional audience response (…). The users of such a system are like audience members who can march up onto the stage and become various characters, altering the action by what they say and do in their roles. (Laurel 1991, p. 16)

As Laurel argues, the user steps over his/her own role to interact with the surrounding environment and become an actual agent. This type of relationship is enacted through the stimulation of human senses, in fact 'the user of a VR system interacts with a world that is experienced as existing autonomously because this world is accessible to the body through many senses, particularly to the sense of touch' (Ryan 1999, p. 134). Therefore, there are various levels of interactivity between the user and the virtual environment: the level of observation is the most basic one and is provided by the camera control whereby the viewer has an HMD on and can move and turn his/her head around to see the 360° scene. Observation allows the user to understand where he/she is precisely located within the virtual dimension and it is the first component that provides the immersivity sense. Then, at a higher degree of interaction, there is the navigation mode that allows the user to explore the virtual world either by physically walking around the real room or by teletransportation with the commanders of the VR device. In fact, when the virtual environment is too wide to be covered physically by foot, other means of transportation around the virtual landscape are made available, such as: the hand directed modality where the orientation and position of the user's hand directs the movements in the virtual dimension; the gaze directed

mode instead is applied when the combination of the viewer's looking direction and head orientation determines the movements. For instance, in Anthony Gormley and Priya Natarajan's *Lunatick* this specific modality is used to navigate, like a flying subject, throughout the lunar surface. Then, another transportation medium is given by the input devices such as the controllers that mirror the user's physical command in the virtual space, this is the case for example of Marina Abramović's *Rising* where the controllers stand for the user's virtual hands. Eventually, the most sophisticated and complex level is object manipulation, which allows the user to detect and select objects within the virtual scene and manipulate them by changing their features, or moving, rotating and scaling them.

4.2.5. Binaural Audio

Until now the focus has been on the sight as a sense to be highly stimulated in VR in order to achieve immersivity, and, as a matter of fact, it is the human sense that contributes the most and captures the main information. Nonetheless, the hearing is an almost equally important sense, especially for VR storytelling, because immersivity cannot be provided only through visual perception but also through virtual reality audio, which allows the user to maintain his/her attention on specific spots, as well as it can encourage feedback and emotional response. It is true that too many elements within the virtual environment could lead to confusion, however if there is high quality audio, it is easier to direct the user's attention to the central aspects of the virtual scene.

There are two types of audio VR can employ for its experiences: the traditional audio and the binaural audio. The traditional one is provided by stereo sounds and it is easier to be implemented and controlled within the virtual space, however it is not truly immersive since the user, when moving his/her head around, will hear the sounds following him/her, hence the feeling of presence in the virtual landscape will be immediately wiped out. The second type of audio, the binaural audio, is used in virtual reality experiences for

immersivity purposes. It was first introduced in the 80s with the constraint that the listener should remain in a static position without moving his/her head around to have a thorough experience of it. However, with the technologic advances especially in the field of VR, today the user is able to move freely throughout the virtual landscape while having an authentic virtual acoustic experience that simulates the workings of human hearing. In technical terms, binaural audio takes advantage of the interaural time difference, that is, the time difference between the sound travelling from the source to one ear in comparison to the other; the environmental reflections whereby the sounds the user hears do not derive directly from the source but they originate as reflections from floors, walls, and other surfaces; the sounds filtered by the user's body, in other words, the user's physical features are involved in the way in which he/she hears the sounds (Bible, 2016).

Having outlined the user experience according to the virtual reality components that characterise the experience itself depending on the feeling of presence and immersivity; the potential for interaction and agency; the rise of emotions through the sense of embodiment; and ultimately the visual and audio cues; the experiential fidelity between user, VR piece and storyteller is established. In the following section, after the presentation of the Phi art centre's mission, the selected case studies will be discussed in light of the main features of the different disciplinary sectors in the field of virtual reality storytelling, hence the intersection and convergence between immersive technologies and humanities.

5. Case Studies

The case studies under analysis were selected for their innovative approach to the use of virtual reality as a storytelling medium. They provide diversified perspectives on social and historical issues, they deal with tropes of travel and exploration, and ultimately, they discuss the conflation of the digital with the real. All of them investigate the immersive technology of virtual reality according to their respective domains, namely cinema, art and theatre.

4.1. The Canadian Phi Centre

> Technology is the means through which artistic expression can be articulated. The symbiosis between art and technology is the subject of Phi's great quest. (Phi Perspectives - episode 5, 2020)

Founded by Phoebe Greenberg and based in Montreal, Phi is a Canadian multidisciplinary arts and culture centre whose mission is to challenge the limits of communication between technologies and the disciplinary sectors of art, cinema, and theatre, as well as to find a balance between narration and the digital. Its aim is to explore the cross-sector collaboration and intersection of immersive digital devices and humanities. Interactive exhibitions are its main focus since they allow to investigate the relationship between artists, creators, storytellers and their audiences. Phi is particularly concerned with modern storytelling through the use of immersive technology such as virtual reality, augmented reality and mixed reality. In light of interactive narrative, the Canadian centre puts to test the participatory approach of audience members and prompt them to establish connections with the narrative environments and medias taking advantage of the transformative power that this kind of processual and unconventional storytelling entails. Engaged in new forms of narrative, the centre organises *PHI Perspectives*, a series of conferences aimed at revaluating old systems of narration through uncommon viewpoints, balancing between tradition and change. The idea on which the centre is based is that technology influences storytelling and vice versa through a

harmonic cooperation and interchange of methods and tools. However, in order to evoke the human experience, the digital and narrative components should be placed on different levels: the predominant and central part might be defined by the story, which becomes the main attraction, whereas technology should play the supporting role. The intersection that Phi constantly proposes between virtual reality and arts within a journey of interactive and participatory storytelling became the focus of an innovative exhibition parallel to the 2019 Venice Biennale located precisely in the city downtown.

5.1.1. Phi Immersive: Theatre of Virtuality – Venice

Figure 15 – Phi exhibition at Ca' Rezzonico Galleries for the 58th Venice Biennale

In 2019 for the 58th Venice Biennale, the Canadian centre decided to present 'Phi Immersive: Theatre of Virtuality', a six month-long exhibition at the Ca' Rezzonico Galleries centred on virtual reality pieces that explore the use of immersive technologies in the different domains of art, cinema and theatre. The conflation of the traditional with the innovative and the blurring between

past and future are already detectable in the location chosen for the exhibition: the Baroque galleries are situated next to Ca' Rezzonico, the Museum of 18th century, on the Grand Canal, representing a sumptuous historic past. Once inside the galleries, there is an immediate juxtaposition between the Baroque architecture and the virtual reality installations, the apex of current technology and a frame of the prefigured future. The underlying theme of Phi program is 'Dare to Disturb' in an attempt to let visitors undertake a journey through art, cinema, and theatre, which allows them to critically think about real world issues, the role of technology in human lives, and to speculate about the future of art and culture.

> This exhibition offers an opportunity to see the works of some of the most compelling artists of our time exploring the immersive world of virtual reality. Familiar landscapes and textures of these renowned artists can be seen through the lens of these new technologies. (Greenberg, 2019)

The parallel program with Venice Biennale consisted of a wide range of virtual reality experiences including some of the case studies examined in the present dissertation. Several collaborations were proposed by the centre with established artists, performers and VR companies in order to set up the exhibition: through the technology and digital devices provided by Acute Art a number of projects by Anish Kapoor, Olafur Eliasson, Marina Abramović, Nathalie Djurberg and Antony Gormley were created; Felix & Paul Studios contributed with the introduction of the virtual reality cinema section; ultimately, the VR collaboration between Samsung America and Punchdrunk International enriched the exhibition with theatrical performance. The aim of the event was to hypothesise the future of contemporary media and to visualise how emerging art forms are consumed and how these new media are utilised within a context that blurs the boundaries between real and fiction.

The two galleries arranged for the virtual reality pieces were functionally divided between VR cinema (during the first phase)/ VR theatre

(during the second period program) and VR art. Before examining the case studies in detail, a brief description of the VR studios is provided in order to illustrate their aims and collaborations with each domain considered.

5.2. Felix & Paul Studios

Acclaimed VR producers, EMMY award-winning creators, Felix & Paul devote themselves to the craft of immersive storytelling. They create compelling and ground-breaking experiences combining technological innovation – by using virtual reality, augmented reality and mixed reality – with a unique approach to the new art of VR narration. Their goal is to combine new medias with cinematic pieces in a 360-degree environment to build alternative highly realistic worlds. Through the use of Oculus visors, they provide viewers with a wide range of immersive works: from the entertainment experiences such as the adventurous tour in the guise of a velociraptor (*Jurassic World Blue*) and the ghostly setting of an abandoned school (*Gymnasia*) to the documentary films about the new age of space exploration (*Space Explorers Series*) and the travel history of black Americans through the US (*Traveling While Black*).

5.2.1. Roger Ross Williams' *Traveling While Black – the issue of racism*

> Every trip through America for a black person during those times was potentially fatal. The assumption is that some time it stopped, and that's not the case, it never stopped. Traveling while black, I wonder when does it end. (Traveling While Black, 2019)

Premiered at the 2019 Sundance Film Festival New Frontier exhibition, Oscar- and Emmy-winning filmmaker Roger Ross Williams together with Alesha Nadarajah proposes a cinematic virtual reality documentary that tackles the long history of restrictions imposed to black Americans when traveling throughout the United States and how the African American communities were able to create safe spaces to defend themselves from racism and

exclusion. The director's idea to develop this narrative thread was inspired by the 2010 play "The Green Book", which in fact was based on the homonym guide illustrating travel tips, places and restaurants for black motorists traveling the country during the segregationist period in America. In an interview in 2019 (Carey), Williams claimed that virtual reality has become for him a tool of social justice through which he was able to deal with the issue of racism and discrimination, which is still very present in contemporary society, and to foster the need for safe places removed from the danger of being excluded or even assaulted on racist grounds. The virtual reality piece that emerged from the director's intentions and his collaboration with Felix & Paul Studios is a highly emotional experience that helps viewers to understand the difficulties and predicaments that black Americans had to undergo and it also offers an interesting perspective on the challenges that minority travelers have to face still now. The documentary introduces the spectator to the historic Ben's Chili Bowl, a Washington diner and a reunion place for the black community:

> Since 1958 Ben's Chili Bowl provided Washington, D.C. with a place to call home, and a place to get the best chili in the country. Recognized as a destination spot for influential leaders and tourists, a hallmark of the civil rights movement, and a stalwart presence in the face of adversity over six decades, Ben's Chili Bowl quickly became – and remains – a pillar of the local community. (Traveling While Black, 2019)

The description included above appears in the VR piece on a yellow poster that reads 'Celebrating Ben's Chili Bowl's 60th Anniversary' when the viewers find themselves at a diner's table while listening to the experiences of the clients who are travellers and activists. Apart from hearing the protagonists' stories, they in fact are able to explore the environment by turning their heads and being captivated by graphics such as the afore-mentioned description. In this way, they are able to learn about the diner's history, which interestingly enough was included in the famous Green Book.

The reason why Ben's Chili Bowl was an important base to tell the story was because it has a long history as a safe space for African Americans. It is where President Obama—he went there and had a hot dog after he took the oath of office…It is what *The Green Book* was all about. (Williams, 2019)

Figure 16 – Ben's Chili Bowl Diner in Traveling While Black

Published from 1936 to 1966, the Green Book was the annual guide for black Americans 'to travel safely, find shelter, food and guest in a time where these basic rights were not guaranteed' (Traveling While Black, 2019). As a place included in the guide, Ben's Chili Bowl becomes central to the documentary in order to portray the real essence of the diner, which was a reference point to the black community:

From a creative standpoint, we really put ourselves in immersion in Ben's Chili Bowl in order to truly capture the essence of the place. As we spent many hours and many days in this restaurant, it allowed us to understand how we could use it as a vehicle to tell those stories.

> Roger also orchestrated many interviews from many people to help
> choose and align where our story was going. (Raphaël, 2020)

The Washington D.C diner is employed as a sort of theatre from which all the action is projected. The theatrical image has a double meaning for it symbolically represents the stage on which the VR experience is built, and at the same time it literally refers to the history of Ben's Chili Bowl, which was a former theatre that is displayed as the first scene of the documentary. As a matter of fact, at the beginning of the experience, viewers find themselves in the theatre where *Traveling While Black* starts to be screened. It is an interplay of images and cross-references that allows participants to virtually travel through space and time, from the former theatre to the current restaurant, from the history of restrictions imposed to African Americans in the 60s to the present story of the interviewees and the diner. From the stories recounted, Virginia Ali's interview stands out as she explains what the restaurant meant to represent in that unstable period and the reasons behind its foundation. She, in fact, founded the diner with her husband Ben in 1958 and they wanted to recreate 'a safe haven for people', a place that 'was a home for them', removed from the segregated Washington where racist offences were daily occurrences.

By using virtual reality and a first-person point of view, the documentary takes advantage of the immersivity and intensity, as well as the feeling of presence, characterising the medium so as to place the viewer vis-à-vis the concrete storytellers, namely those who were interviewed and who had experienced themselves the difficulties of that period.

> The main thing about VR is that you are totally 100% immersed in a
> story. It allows the viewer, whether the viewer is an African American
> who has experienced this —all African Americans have—or even if
> you're not, you get to be in a black space that you normally wouldn't
> have access to, and really experience that sense of community that
> happens in places like Ben's Chili Bowl and places in *The Green*

Book. I think that's really powerful in the way that 2D storytelling can't provide. (Williams, 2019)

Thanks to the close proximity to the protagonists of the VR piece, the viewer finds him/herself inches away from the interviewees and he/she becomes part of the conversations held at Ben Chili's Bowl, sharing almost the same intensity felt by those telling their personal stories. In this sense, the viewers experience the apex of embodiment for they feel as they were at the same table as the other characters, directly interacting with them and empathising with their emotional state as they recount their moving stories. The connection between the cinematic virtual reality experience of *Traveling While Black* and the Oscar-winning 2018 film *Green Book* is immediate since both deal with the same theme of rights' restrictions for African American travellers. However, while the latter is set back in the 1960s unfolding the action in the past, *Traveling While Black* not only deals with events traced back to that same period but it also adds another temporal layer that is attributable to present times. Indeed, it introduces viewers to Samaria Rice's interview (see figure 17) where she describes the terribly unjust and unbearable episode of her son's death: Tamir Rice was twelve when he was lethally shot by a policeman in 2014, Ohio. Again, viewers find themselves at the diner listening to the tragic event and witnessing Samaria's hopelessness:

They would not allow me to touch him. They said he was evidence. I wasn't finished raising him. I wasn't finished nurturing him. And America robbed me. Yup, they robbed me. (*Traveling While Black*, 2019)

Past and present merge and demonstrate how the same horrors of racism keep repeating themselves through current times. Thanks to the use of virtual reality, Williams intends to address the issue of racism and the remnants of slavery by opening a dialogue on these themes and by combining it with the intensity of the medium in order to create an impactful piece that renders justice to the subject involved.

Figure 17 – Samaria Rice recounting her tragic story in front of Virginia Ali inside Ben's Chili Bowl (viewer's POV).

Traveling While Black reflects on the traumatic experiences of black Americans referring to both the past and the present, emphasising the urge to elicit critical empathy, prompting 'honest conversations' on the predicaments that minority travellers still have today.

> I think that if you are not a person of color and you watch this film, you walk away transformed. […] You feel the sort of empathy and the pain really that black people carry with them in a country that hasn't confronted the reality of racism, in fact, in a country where racism is on the rise…As a black person, I want you to walk away and want you to have open and honest conversations with people in your community about that trauma. It's like therapy. We need to talk about it. (Williams, 2019)

Virtual reality becomes a congenial medium when it invites viewers to empathise and truly understand situations and conditions that may be alien to them. As a black storyteller, Williams, by taking advantage of the immersive characteristic inherent to the digital tool used, gives voice to the African

American community drawing attention to an important issue still symptomatic of today's societal structure and stigmas.

> When you experience this documentary in VR it's all around you, and you can't escape it. Once the headset goes on, there are no external distractions. In the same way, we can't escape our blackness or the reality of being black in America, I didn't want people to be able to escape the experience they have when watching *Traveling While Black* and this immersive feeling could only be achieved through VR. (Williams, 2019)

5.2.2. The *Space Explorers* Series – the documentary mode

As it occurs in *Traveling While Black*, *Space Explorers* as well adopts the documentary technique that employs real footage rather than computer graphics. This choice is due to the current state of virtual reality, which is demonstrated to be stylistically more mature when approaching the documentary genre. Another element in common between the two cinematic VR experiences is the theme of travel: on the one hand, there is the history of movement restrictions imposed to black Americans, on the other, universally speaking, there is the human desire, ambition and ultimately achievement to travel and explore the space:

> We shall not cease from exploration
> And the end of all our exploring
> Will be to arrive where we started
> And know the place for the first time.
> (Eliot, Little Gidding, 242-245)

As T.S Eliot claimed in his poem 'Little Gidding' (1942) humankind's urge to progress determines the incessant movement towards the exploration of the unknown that ultimately serves to understand the real and known. The utmost example of exploration is that which leads humans to journey beyond

the Earth's atmosphere. This is what happened when the Moon was finally reached by men and, through the acquisition of new knowledge proceeding from this massive space travel, it was possible to pave the way toward a new era of explorations that led humanity to current times when the discovery of Mars represents the highest ambition.

> The pace of development is picking up and the vision of getting to Mars is becoming real and I think the next thirty years are going to be great in the history of human space exploration. Fast forward through generations and generations and generations we're going to have humans living on other planets within the universe because that's our future. (Grenhart, *A New Dawn*, 2017)

Since the topic has always attracted much attention and curiosity and thanks to the potentiality of virtual reality to explore alternative worlds and unfamiliar states, Felix & Paul Studios decided to dedicate a special division to the world of spaceflight focusing on the creation of immersive space storytelling and documentation by filming in ultra-high-definition 3D, 360-degree virtual reality aboard and outside the International Space Station, becoming the only NASA-approved studio. The team successfully collaborates with astronauts by filming them in their daily tasks and life at the ISS. Narrated by the academy award-winning actress Brie Larson, *Space Explorers* is a documentary film series that attempts to shed light on humans' most ambitious space journey to Mars. It is divided into two parts, *A New Dawn*, which specifically follows the lives of NASA astronauts in their daily routines and tests, as well as their trainings to launch into space, and *Taking Flight*, which focuses on the collaboration between NASA and other countries, such as Russia, to preserve outposts like the International Space Station. The *Space Explorers Series* is continually updated and enriched thanks to the solid and unprecedented collaboration with NASA, which led to a new project by Felix & Paul Studios, *Space Explorers: The ISS Experience*, resulting in a product of over 200 hours of footage in space, capturing the astronauts' lives aboard the International

Space Station. It is considered the most ambitious and extensive virtual reality documentary ever filmed in space.

5.2.2.1. A New Dawn (2017) – first episode

> Not long ago when the Moon seemed impossibly far away, on July 20th, 1969, powered by the rocket, three American astronauts aboard a spacecraft called Apollo-11 landed on the Moon. (…) For the last eighteen years, astronauts from eighteen different countries have been living at the International Space Station, younger astronauts are coming of age in a new era of global partnership. When they imagine their futures, they dream of Mars and deep space, and as they train for missions, they do so, knowing the stakes have never been higher. (Larson, 2017)

This virtual reality live-action documentary transports viewers into astronauts' daily life, introducing them to both the new and veteran generation of cosmonauts such as Sunita Williams, Jessica Meir, Jeanette Epps, Victor Glover and Micheal Grenhart who share their experiences and what being part of NASA means for them, as well as what space exploration stands for in current times. Jessica Meir claims that for her 'space exploration is about opening your mind' and to think about 'the possibilities beyond just building [a] spacecraft, but living in space, and being in space, and traveling farther in space'. To understand how the astronauts prepare themselves for very demanding missions, the documentary shows them while training underwater at the Neutral Buoyancy Lab at NASA, flying in a T-38 jet or run testing a space exploration vehicle in the desert (see figure 18).

Thanks to *A New Dawn* virtual reality documentary, viewers are able to see the 'behind the scenes' of cosmonauts' trainings in detail, understand what space exploration represents for NASA's quest, listen to its protagonists and share with them their feelings about this new era as they were real astronauts as well.

Figure 18 – A space exploration vehicle used for a run test in the desert

5.2.2.2. Taking Flight (2018) – second episode

> Since the year 2000, the United States and Russia have made 52 expeditions together to the International Space Station. Half a century ago it would have been unconceivable for arch geopolitical rivals to join forces, but space exploration has inspired a new era of diplomacy and international cooperation. (…) For as long the humans inhabit the Earth, the mystery of the cosmos will entrance us. The quest for answers transcends the national borders, cultures and languages. All of humanity is on this journey, together. (Larson, 2017)

The second episode of the series explores both the collaboration between NASA and private space companies (i.e. Space X and Boeing) and the cooperative spirit that is shared throughout world's national space programs. Viewers are invited to experience themselves up-close rocket launches and to travel from Kazakhstan, through Cape Canaveral, to Russia. For instance, they are introduced to Russian cosmonaut Alexander Misurkin's interview on the Roscosmos rocket launch to the ISS and the pre-launch training:

The process of launching the rocket into orbit takes less than ten minutes (…) but I went through an enormous number of intensive trainings to be ready for any and all situations in space. The Centrifuge simulator is very important to our pre-launch training. It allows us to check our health and determine if we are fit for the missions. (Misurkin, 2017)

It is extremely thrilling for viewers to be next to the cosmonaut inside the rocket and to see all the training activities required to be prepared to that kind of missions, including the Centrifuge simulator, which in the VR piece is displayed during its activation and rotation at an increasing speed as though it almost came out from the screen. Then viewers find themselves within only six kilometers of the real Space X rocket launch (so close that part of the camera cover actually melted when capturing the rocket's departure).

Figure 19 – Roscosmos space rocket launch (viewer's POV)

A few moments later they are inside the rocket, which transports them to the International Space Station from where they can actually move out and experience the feeling of floating in the outer space. From that vantage point,

they are able to see the Earth while listening to astronaut Fyodor Yurchikhin's experience of collaboration with NASA and the American cosmonauts.

The episode ends on an optimistic note, fostering a significant political message of international cooperation in space in order to progress with the era of space exploration.

> The advent of commercial space and international cooperation in space (…) has really opened up a new generation of space exploration. I think we would be much more successful as a collaborative effort when we start venturing out farther into space than doing it individually.

Both the episodes, thanks to the virtual reality technology, address the deep-rooted human desire of traveling in the outer space, as well as the individuals' urge to exonerate from a close and familiar reality (Cometa, 2017) where there is little left to discover and to be curious about. The need to discover is what drives humans to engage in immersive experiences that can lead them to feel what is uncommon or unreachable, in this case, the space:

> In the biggest picture space exploration is our future because someday we're either going to destroy the earth or the Sun is going to blow up, so our future as a human race is out there in the universe. The contributions we make are small steps along the way in a continuum into the very distant future. (Grenhart, 2017)

However, it is not only a matter of immersive experience but also of immersive storytelling. Virtual reality presents itself as a tool that can equal these two components by placing them at the same level without having one overwhelming the other. In this sense, Felix & Paul's intent was to create a *synergy* between experience and story, immersing viewers in the same atmosphere shared by NASA astronauts, allowing them to have the precise feeling of being present aboard the ISS, by sharing with them the trainings

and space rocket launches, and at the same time presenting the viewers with a compelling story that shows them the personal joys and troubles of being a cosmonaut, as well as their desires and ambitions:

> VR is the] only medium [that] can make you feel like you are present inside the story, with the capacity to stand next to space rockets at their real scale...We wanted viewers to experience this story as if they themselves were space explorers and astronauts – with a sense of direct emotional and sensorial engagement. We knew from the beginning that the main challenge of this series would be to establish the right balance between telling a revealing story and creating a compelling experiential and immersive journey for audiences. In other words, we wanted the story and the experience to form a synergy and symbiosis and not to "compete" with one another. (Lajeunesse, 2018)

The balance between story and experience is achieved through particular stylistic choices whereby there is an alternation of more experiential episodes and more narrative scenes. When the viewers are immersed in shots that are more physically demanding since they plunge them into action – such as the t-38 jet flight or the underwater scenes – then their 'level of receptiveness and attention to any additional story content (a voice-over narration that would be added on top of the visuals for instance)' (Lajeunesse, 2018) is almost zero. Adding extra narration to those dynamic scenes could result in an overwhelming feeling on the viewer's part. On the other hand, there are shots that are suitable for 'inspirational or philosophical voice-over content' since they are more immersive and reflexive rather than active and dynamic, such as the open landscapes, the scenes in the desert and in the outer space. There are even shots in which the content delivered is more informational and educational such as the cosmonauts' interviews where the viewers find themselves vis-à-vis the interviewees. In this case the goal is to minimise the distractions in the stereoscopic environment so that the viewers can truly engage with the astronauts' stories. As Lajeunesse (2018) explains:

It's all about syncing the story ark and the communication of ideas throughout the story, with the experiential and immersive modulations of the piece.

Virtual reality has not only served as a means of narrating NASA's life and objectives, but it has also been used in space and military research by NASA itself since the 60s and for astronaut training since the 90s. In specific, virtual reality systems have been introduced to simulate microgravity as well as life on Mars.

5.3. Acute Art

Directed by Daniel Birnbaum and based in London, Acute art is a virtual and augmented reality production and distribution platform that allows artists to forge their artistic projects through the use of immersive technologies that help them to interact with audience members by opening virtual and critical channels of communication. The platform is known for establishing collaborations with celebrated contemporary artists who work for the first time with the medium of virtual reality, becoming a total novelty and a challenge for them to module their art pieces into a 360-degree environment. The case studies inserted in this section produced by Acute art show how versatile this immersive digital tool is since it is applied to different stylistic approaches: from a mix of documentary techniques with educational and entertaining content (*Lunatick*), through an eye-opening and revealing experience about global warming (*Rising*), to a more abstract and sculptured journey through the human body (*Into Yourself, Fall*) and subconscious (*It Will End in Stars*).

5.3.1. Antony Gormley and Priyamvada Natarajan's *Lunatick* (2019) – an Art-Meets-Science project

Virtual reality is the latest tool to extend our consciousness imaginatively beyond the limits of our bounding condition and realise our cosmic identity. (Gormley, 2019)

Once again, as in the *Space Explorers Series*, this virtual reality piece explores the outer space and in particular the Moon's surface. It is the product of the collaboration between artist and sculptor Antony Gormley and Yale astrophysicist Priyamvada Natarajan, and it uses real data gathered by NASA's Lunar Reconnaissance Orbiter (LRO) to map an interactive journey from Earth, through the atmosphere and stratosphere, to the Moon and ultimately the outer space. To produce the perceptual sensation of looking at real size elements within the infinite scale of the universe, Acute Art employs a multi-scale modelling that efficaciously renders both the tiny objects as well as the massive elements such as the Sun. What *Lunatick* adds to Felix & Paul's documentary is the interactive experience, which allows the user to fly in all the directions through the earth and the sky and to feel the absence of gravity on the Moon's surface (see figure 20), hence the piece reveals itself to be extremely corporeal in spite of the lack of bodily presence.

Figure 20 – the user's view of the Earth from the Moon's surface

In this sense, Gormley combined Dr Natarajan's research on cosmic realities, dark matter and black holes, with his lifelong interest in the human body extrapolated from its own space to be placed into another dimension. The journey begins on the deserted and almost disappearing – due to the sea

level rise – Christmas Island in the Indian Ocean. Here, users are able to explore the island's vegetation and even to submerge themselves in the water by controlling their intended direction through their gaze. From the island they are projected into the sky through the clouds, where they can experience the feeling of flying, and finally to the outer space where they can explore the cosmos, circumnavigate the globe and, if they are attentive enough, see the Northern Lights. Then they arrive on the Moon, whose surface they can discover experiencing the absence of gravitational force, which translates into a continuous bouncing up and down at different speeds, bumping again into the moon's surface:

> Our nearest neighbour is the moon, and this project allows us to experience it as a found object in space, to explore its vast open spaces and swoop the ridges and valleys of its craters. (Gormley, 2019)

From the Moon, users are transported further into space, going through the Milky Way to the very heart of the solar system, the Sun, which eventually involves them into a blinding white light that signals the end of the piece. The experience somehow replicates the Apollo 11 mission on the Moon happened 52 years ago and allows users to journey where only twelve American astronauts have gone before, hence they become cosmonauts themselves for 15 minutes thanks to the immersive technology of virtual reality, which is also used to reflect on the role of humans in the cosmos as Natarajan explains:

> What thrills me most about Lunatick is how the combination of data, imagination and the latest technology can succeed in powerfully conveying how we as a species occupy this paradoxical place in the universe – we are simultaneously significant and insignificant. Strangely, it is technology that brings this into sharper focus better than any other medium. Maybe ultimately technology will help us find our place in the universe and become more responsible guardians of our precious home. (Natarajan, 2019)

The artwork has not only the aim of entertaining users but also of prompting them to critically think on the environment and on the future of humankind as determined by the biosphere's continued life. The lunar landscape evokes a sense of both isolation and awe, ultimately leading users to confront with their place in the cosmos. If on the one hand they might feel insignificant with respect to the greatness of the Moon, on the other, they might be compelled to reflect upon human's significant impact on Earth as a warning message against humankind's detrimental actions to their so-called home. On a more philosophical level, it invites participants to reflect on the meaning of embodied experiences, on the power of virtual reality to experience corporeality, presence, and unfamiliar states without being directly in touch with our physical body. As a matter of fact, the user's body is treated as a vessel or as a spaceship that wanders throughout the virtual environment allowing the same artist to investigate on the relationship between the human body and the cosmos.

> What Antony Gormley's art always reminds us of is the fundamental
> fact that we are embodied beings. Our perception of the world and of
> others takes place through senses that link our incarnated subjectivity
> to an outside. I understand Gormley's *Lunatick*, his virtual exploration
> of our heavenly spheres, as a continuation of his sculptural practice.
> Isn't the moon an astonishing work of sculpture? (Birnbaum, 2019)

Although the Moon has been recreated though NASA's collected data provided by space missions, the artist's mastery in sculpture is noticeable across the Moon's surface to the extent that Acute Art director Birnbaum (2019) defines it 'like a Rodin sculpture' with cross-references to Caspar David Friedrich's moonlight artworks. Due to the very nature of the artwork itself in which sculpture predominates, *Lunatick* relies on a much more visual narrative than Felix & Paul VR documentaries. On a storytelling level, the journey is therefore described through mostly accurate images of the space and

especially of the Moon, which are deeply rooted in the imagery collective and extensively present in literature, art and cinema. The visual quality of the piece is combined with an interactive approach that allows users to venture throughout the diverse environments choosing their own specific trajectories. The journey through the outer space and the Moon as the main subject of the virtual piece stands for a specific choice that relies on escapist fiction and the need to evade from real world problems to be projected into an alternative reality, an inaccessible realm, removed from daily matters. Lunatick conflates this escapist need to activate imagination through art with environmentalism, hence the reality of rising sea levels (as connected to the gradual disappearance of the Christmas Island), and technologic advancements (which allowed to generate the experience through NASA's data) as well as the questioning of the human role in the universe.

5.3.2. Marina Abramović's *Rising* (2018) – the issue of climate change

Just as Lunatick briefly points at the issue of global warming, which threatens the Christmas Island, so does Marina Abramović's first virtual reality artwork *Rising* through a poetic, yet unsettling, call to action, attempting to raise awareness on the effects of the sea level rise and to hold experiencers accountable for climate change. Included among the artworks of the 2019 Venice Biennale, the VR piece through the theme of rising sea levels offers an interesting perspective on the Italian city as well, which suffers from a major environmental issue that exacerbates the 'acqua alta' phenomenon and threatens it with the danger of sinking.

The piece required a detailed, three-dimensional avatar of Marina Abramović's herself, which was recreated through the capture of her facial expressions in order to generate it as close as possible to reality, and the artist herself had to train through several immersions to realistically represent her avatar's body underwater. The avatar appears to users at the beginning and at the end of the experience, challenging them with an ethical choice to make – whether or not to save the artist from rising sea levels, a scenery that is

metaphorically represented through a cage filling up with water where the avatar is to be found. Users can then make contact with the artist, interacting with her avatar by approaching the glass tank and virtually touching her hands. Suddenly, another environment replaces the first scene of an abandoned warehouse, participants find themselves in the middle of the Arctic sea and are confronted with the dramatic landscape of melting polar ice caps and rising sea levels while they are on a tiny unstable wooden dock. Thunders and lightnings along with an increasing stormy sea and the disintegration of the iceberg overawe them. Here, the fear of drowning urges users to reflect on humans' impact on Earth and the tragic consequences that their actions have on the environment. The artist builds a parallel between global warming and her avatar's entrapment within the cage: if users decide to save her, the water in the tank will lower and they will contribute to the environment with their symbolical support:

> Some predictions say that, in just one hundred years, the human race
> will no longer exist on this planet. I want to address these issues. You
> are saving the human being and you are saving the planet, or you are
> not saving the planet and you make human being die, and the choice
> is only yours. (Abramović, 2018)

Figure 21 – Second part of the art experience Rising – melting polar ice caps (user's POV)

However, at the end of the piece, when users return to the first scene vis-à-vis the artist's avatar in the glass cage, the water is already over Abramović's head, she starts gurgling and she ultimately drowns. With this overwhelming and frightening conclusion, participants understand that they cannot save the artist from drowning and that the metaphor is just a mere illusion, bearer of a significant warning against what it may be humankind's future if they do not immediately take action to prevent the current dramatic environmental conditions from worsening. Users are asked to acquire consciousness about the issue of climate change and to avoid the perpetration of human detrimental and unecological acts to the earth. Abramović takes advantage of the real-time nature of virtual reality to represent the rapidity through which the environment collapses and to immerse users within an apocalyptic, yet painfully real, landscape that threatens the artist's life and theirs:

> I was really interested in the idea of videogames and how children are playing the games that are based on aggression, violence, and fear. I was thinking about how I could reach a young audience. You need to use their tools; VR and video games. That was the best way for me to reach the audience I might not have been able to reach. I created a situation where they could experience fear and the imbalance of certainty, to see what we can do individually about this. (Abramović, 2019)

In this sense *Rising* is intended by the artist as a videogame rather than a work of art where players are 'immersed in a dystopian world that seems increasingly likely to be the future of our planet'. Virtual reality is used by the artist as a non-mediated tool that with its visual and 360-degree nature impacts on users who in fact believe to what they are seeing and are surrounded by. The interplay between videogame and artwork is also transposed onto the title itself, which entails a linguistic pun, since it refers both to the rising sea levels and its aim to generate a rising consciousness

around the issue of global warming. Notwithstanding the interactive approach, which may define the piece as an entertaining virtual reality game, the artwork is extremely committed to the environmental cause and establishes a reflexive relationship with users who are both players and conscious participants – their actions imply consequences to the artist's avatar, the virtual world, and themselves:

> I hope to explore whether immersive play will increase empathy for current and future victims of climate change, and how this will affect a player's conscience and energy. In real life, when someone rescues another person or offers aid, there is a transfer of energy; both are affected by the experience. Will the same happen in virtual reality? (Abramović, 2018)

Virtual reality is used by Abramović as a tool that, thanks so its high degree of immersion, can elicit empathetic feelings for others and for the Earth itself, potentially translating these emotions into concrete actions in the real world. From the storytelling perspective, the piece points at all the fundamental aspects of an efficient virtual reality narrative: it entails a story as a process in which users become active parts and they are involved in real-time in what is occurring, it allows them to interact with the characters and environment presented by also having an influence on the unfolding of the events, it provides them with a critical viewpoint on a current and impelling issue, which they are prompted to reflect upon. Abramović's piece is not the only one relying on the medium of virtual reality to address the environmental cause: other artists, as well as scientists and environmentalists started using this immersive technology to present diverse narratives on climate change. Already in 2016 artist Tamiko Thiel presented *Gardens of the Anthropocene* to display the mutations that aquatic and terrestrial plants have undergone to survive to global warming; the Yale Program on Climate Change Communication organised a hackathon in 2019 on the use of virtual reality and augmented reality to convey effective communication on the risks of global warming. The same technology company HTC, which designs and

develops the VIVE visors (used for *Rising*), fosters projects on climate change and sustainability through VR For Impact to drive awareness on these issues. Far from being a mere entertainment tool, virtual reality, thanks to its immersive and visual qualities, serves therefore also as a major source for raising eco-consciousness on climate change impacts.

5.3.3. Anish Kapoor's *Into Yourself, Fall* (2018) – A penetrating vision

> One of the things I've been concerned with over the years is the relationship between materiality and non-materiality, looking for conditions of material that are more material than material. (…) Virtual world offers that as a possibility because it's all happening in your head, it isn't real, and since I's all happening in there, there is this sense that it's got a hyper quality. (Kapoor, 2018)

Kapoor's piece, as Abramović's digital avatar does, centres on the image of the virtual body. This time, however, it does not refer to the artist but to each and every user partaking in a visceral journey through the human body depicted as a vertiginous fall inside each body part. The piece begins in a windy forest covered with dust from the sandy floor, and suddenly a black abyss breaks the ground, viewers are plunged into a fleshy tunnel as they were actually descending into the underworld:

> Vertigo is a thing that this medium does like no other. It's visceral and fully present as an actual bodily experience. I'm a sculptor. I make objects, and I'm interested in that body thing; bodily interiority. So, it seems obvious, but with vertigo you fall into yourself, fall inwards. (Kapoor, 2018)

The falling illusion and the void imagery is already present in other Kapoor's works such as *Descent into Limbo* (1922) and *Descension* (2015), but with virtual reality this 'limbo condition' is much more effective and impactful, although still illusory. *Into Yourself, Fall* represents an introspective

descension as well (see figure 22), both haptic and transcendent, into a pit made of flesh and muscles to discover the inner workings of the self.

Figure 22 – The fleshy chasm at the beginning of the experience – 'falling into the human body'.

The virtual reality piece in fact stands for a journey into the unknown where the physical and the digital blend and users experience the materiality and corporeality across the interior of the human body. Just as *Lunatick* plays with the shift of scales to provide viewers with accurate representations, so does Kapoor's artwork use an immersive perspective that however does not rely on proportionate measures but rather poetically inverses them by showing users internal corporeal landscapes as they were gigantic when normally they have microscopic sizes. To increase the sense of immersion within the virtual tunnels, the sonic environments, which are based on the artist's son Ishan Kapoor's soundtrack, are recreated through a trans-diegetic approach that renders sound as if it were truly proceeding from the given virtual world. The introspection experienced by viewers, who are like endoscopes through their own bodies, is translated into a vertiginous and almost disorientating sensation where the bodily dimension becomes unfamiliar and unstable:

Virtual reality is rather interesting, does it represent a new window onto you in another version of the world? (…) One of the things I've discovered about this medium is that it's very good at vertigo. So, of course, the vertiginous and the sublime are very close to each other. This idea of a poetic kind of falling in it's a kind of inversion of the self, (…) it's an elaborate processual journey, a narrative journey in other words. (Kapoor, 2018)

As far as the storytelling approach is concerned, the artist, through abstract geometry, challenges the perception and limits between the real and the fictional, between subject and object, which are central themes in his artworks since the early 80s. Although Kapoor has 'never been enamoured with the idea of narrative' (2018) in his art, with virtual reality he describes a 'processual journey' into the self, from the idyllic scene of the woods to the human body viscera through a series of abstract flashes, resulting in a space constituted of 'body and fantasy'. The artist's sculpted and architectural creations with their biomorphic aspect and void images defy the concept of boundaries within the space, so much so that objects merge with the surrounding environment and with spectators as well.

One of the things that I encountered in my artistic practice is that where matter exists, there is also the absence of matter. When I close my eyes, the space I occupy is not just my body. In some way, the interior space is greater. Now, can someone create an object in which the interior space is greater than the one it occupies on the outside? Of course, it is an old philosophical problem, about what is contained and how, and if the container is sufficient. (Kapoor, 2019)

The immersive technology of VR allows Kapoor to fully conflate the real dimension with the virtual provoking in users a sense of disruption and dislocation, leading them to question the relationship between them and what is around them in a limitless experience where they feel inside the sculpted objects and realities displayed as well as an integrating part of them. Kapoor

explains that the medium of virtual reality 'has this strange, dreamlike quality' and he wonders 'whether it is a place where one can play psychoanalytic games'. In a sense, Djurberg's *It Will End in Stars* attempts to venture throughout the human unconscious with its own peculiar interpretation and depiction of it.

5.3.4. Nathalie Djurberg and Hans Berg's *It Will End in Stars* (2018) – a journey through the unconscious

The Swedish artist duo challenges the nature of virtual reality by using this innovative medium to display their surrealist artworks where realism is removed from the immersive experience to privilege a chaotic and disrupting imagery that point at the innermost human pulsations. The piece, in a similar way to Kapoor's *Into Yourself, Fall*, shares the trope of an introspective journey, which does however investigate the human unconscious rather than the human body. In it, users find the combination between Djurberg's sculpted figures relating to the uncanny, the sexual, and the morbid, with Berg's unsteady and hypnotic sonic environments. As Berg claims (2018), 'the music acts emotively on the spectator and influences his reactions to what he's seeing. It also gives the work a three-dimensionality which fills in the blanks.' If Kapoor's piece attempts to reach the utmost materiality of the body through his sculptures and the digital medium, *It Will End in Stars* lacks that kind of physicality in favour of a fluidity given by the hallucinatory journey undertaken by users whose bodies are however engaged through interaction with the virtual environment. They are in fact asked to follow a number of given visual cues to unlock unexplored parts of the experience: at the beginning of the story, they are surrounded by the archetypical landscape of a charcoal-drawn dense forest, connected with primordial memories, and then they are shown a small wooden hut, which they are expected to access. Once inside it, participants are confronted with the scene of a grey wolf, the quintessentially personification of evil in fairytales, sitting in his own armchair who suddenly looks at them and beckons them to come closer. He utters words that graphically appear floating in mid-air forming sentences that are truncated and

not completely readable as they followed his stream of consciousness. Some of the words pronounced act like a warning against something unknown to users: 'Let's keep memories, they make me company…I am scared'. At this point, they can explore the hut (see figure 23) and are captivated by some objects that serve as portals to teleport users into different dimensions, namely the subplots of the experience.

Figure 23 – The grey wolf in the hut at the beginning of the experience – It Will End In Stars

For instance, they can offer the wolf a cigarette, tap a skull, then a gramophone to start dancing with the wolf himself and, ultimately, there is a tiny female sculpture enclosed in a birdcage that, if approached, leads participants into a new environment. Here, experiencers find themselves outside a cavernous temple and are faced with the sculpted woman that becomes the protagonist of the scene, doubling her size and height, as well as intermittently changing shape and aspect: in some flashes her body turns into a skeleton leaving only her head unvaried as she were half-dead or a primitive semi-deity. Once again, users are invited to get closer to the sculpted woman, precisely under her giant legs, among her huge feet that threaten participants to step on them. The disturbing woman actually represents another gateway to a different scene, that of a starry sky, hence the piece's

title, which evokes a sense of infinity where there are no space and time coordinates. Contrary to *Into Yourself, Fall*, Djurberg's sculptures are used in virtual reality to generate a disembodying experience whereby users truly feel as they were lacking the bodily dimension and were like fluid entities capable of transitioning from one world to another without any effort. On a storytelling level, the artist duo through visual and acoustic cues tries to provocatively narrate the story of a tribulated unconscious with its darkest and most prohibited thoughts. The alcoholic wolf might stand for the human external façade trying to repress the innermost ideas that are symbolised by the perverted and morbid voyeurism entailed in the attentive observation and exploration of the gigantic naked woman, half-dead, half-alive, who becomes herself a disturbing presence in the human mind. The star-scape at the end of the experience symbolises a sort of contemplative moment that could refer both to the user's reflection on the artwork itself or to the epilogue of the inner journey where the human mind tries to reorient its thoughts freeing them from disturbing images. Djurberg and Berg artistic interests focus on the analysis of the basic instincts and primal fears of the human soul, especially the dark side of it. Just as Abramović's *Rising* presents itself as an interactive videogame in which the user is requested to make choices, so does *It Will End in Stars*: experiencers in fact can take different pathways since the very beginning when they are invited to enter the hut. If they decide not to access it, they can explore the dark woods. Similarly, when they are inside the hut, they can choose whether to interact with the miniature woman or keep listening to the wolf's story. In a way, the piece provides participants with freedom of choice investigating their different reactions according to their decisions: some might want to follow their curiosity and keep exploring the virtual environment until the very end, others might want to 'escape' from those mysterious and disturbing objects and symbols that act as a looming threat hanging over them. Choices are not irreversible, if users want to change their journey, hence the intended narrative path, they are allowed to return to the departure point. In this sense, there is no game over as it occurs in *Rising* where the artist's avatar drowns and the virtual environment collapses. Here, participants can experience the full tripartite journey – hut; temple; starry

universe – where each environment does not only represent a physical place but also a psychological space imbued with primal anxieties, or they can just stay and explore only one of the sub-plots presented. The visual nature of virtual reality perfectly fits with Djurberg and Berg's adult fairy-tale narrative based on desire and guilt, animality and humanity, pulsations and repression, the known and the unknown, the visible and the unconscious. Animals, like the wolf, personify perversion and bestiality while the grotesque sculpted figures, like the naked woman, symbolise the repressed and hidden part, all accompanied by electronic and psychedelic soundscapes.

Figure 24 – It Will End in Stars props – in the upper-left, the grey wolf sitting on an armchair; in the upper-right, the sculpted woman's 'clothing' made of bones and bloody arms. In the bottom-left, the woman's head and a winged horse introduced in the kaleidoscopic scenes; in the bottom-right, the skeleton parts of the sculpted woman and the skull inserted in the wolf's hut at the beginning of the experience.

The extended frame of this virtual piece refers to a dark fable world, where fantastic, grotesque and bestial characters represent virtues and vices, metaphors and symbols to portray the most visceral feelings of the contemporary society. The intent is that of provoking experiencers without judging them, immersing them in a magical, yet unsettling, realm where they

undertake an inner journey in which social accepted conventions are subverted, and stable paradigms are undermined. The traditional anthropocentric view based on social balance and rationality is removed in favour of a relationship between man and nature that is based on a continuous metamorphosis and it is essentially bestial and primitive, not tied to a time and space-bound dimension but representing instead the hidden layers of existence. Virtual reality allows the artist duo to introduce a new narrative method that combines the materiality of sculpted figures (see figure 24) and hand drawings with the 360-degree animation of digital technology in a daydreaming journey.

The oneiric quality of this virtual experience, with its mystical and disturbing atmospheres, is evoked as well in the theatrical piece by Punchdrunk, *Believe Your Eyes* (2016).

5.4. Punchdrunk International

Founded in 2000 by Felix Barrett, Punchdrunk fosters a type of performance art that revolves around the concept of immersive experiential theatre. Mostly celebrated for its ground-breaking adaptation of *Macbeth* – the mask show *Sleep No More (2011)* set in a film noir atmosphere – the company is internationally recognised for its continuous exploration of new genres and media, including new technologies such as virtual reality. It is in fact renowned for its innovative approach to theatre marked by the creation of multi-sensory theatrical worlds and a participatory narrative based on actors-audience interaction. Indeed, the troupe's name recalls its aim to focus on the audience by emotionally and physically impact spectators who should feel 'punch drunk' by reviving all their senses through a novel immersive storytelling mode. Audience is a fundamental part of Punchdrunk's pieces as it is not deemed a passive entity but an active participant that can move around the performance's space, make decisions, and take action:

Our guiding principle has always been that that the audience is constantly on our minds as the centre of everything. They are not passive, but what is most important here are their feelings. They are shooting their own movie or are the hero of the story. When we create our work what we always come back to is the audience's experience and their feelings at any given moment, what we want to draw their attention to, and how we can surprise them, shock them, and enchant them in different ways. We're trying to empower the audience by making them feel like they're the most important person in the space. (Harkness, 2017)

Space and audience are two inextricably intertwined entities, and this is especially true with *Believe Your Eyes* where space is not only physical, but also virtual. Similarly, participants are not mere spectators, but they interact with the environment and the performers on both the real and the digital level in an experience that goes beyond the visual and acquires a tangible quality.

5.4.1. Punchdrunk & Samsung Electronics America's *Believe Your Eyes* (2016) – blurring the lines between virtual and reality

The show *Believe Your Eyes* came about because we wanted to play with the crossover between 360 films and VR headsets to create a really rich experience. We tried out a lot of existing VR that was spectacular and transportive, the kind where you are floating on a lake or on top of a mountain or flying through the air, but we deliberately wanted to make something quite simple and almost the opposite, something very human and intimate. It definitively came from our experience of doing a lot of one-on-one theatre, with just one performer and one audience member. (Harkness, 2017)

The theatre company joins Samsung Electronics for the production of an intense immersive experience – awarded a Silver Lion at 2017 Cannes Lions Festival of Creativity – that for the first time mixes virtual reality with art

performance enhancing the potential of interaction on multiple levels to create dream-like atmospheres, which at the same time feel quintessentially real. *Believe Your Eyes* belongs to the *One-to-One experiences* category, which refers to 'performances that are designed for one audience member and explore the direct connection between performer, audience and space' (Abrams 2019, p. 11). Not only audience members are important, but also the use of space for the theatrical pieces, hence Punchdrunk's introduction of a site-sympathetic theatre, which aims at 'an impressionistic response, drawing on similar impulses but creating a dream world within the space rather than practical, literal retelling of the space' (p.10). Indeed, following the anticipation principle of experiential fidelity (see section on experiential fidelity), the setting of *Believe Your Eyes* already hints at the virtual story that will be presented to users: a tiny red room with a dim lightning, walls covered by theatre curtains and the floor hidden by a heavy burgundy carpet. In the middle of the room, participants find a swivel chair oriented towards another seat, which is empty too. For the 2019 Venice Biennale exhibition, the performance was enriched with two additional scenes – at the beginning and at the end – that enshrine the diversified nature of interaction offered by the piece. The proposed narrative approach in fact entails two layers of interaction – the physical and the virtual – which are not two separate entities but are deeply intermingled. As Harkness explains (2017), in *Believe Your Eyes* there is an exploration of 'how a digital world can cross over into our live world', and how virtual reality boosts the audience-focused storytelling through 'a [virtual] filmic world that is 360 degrees, but also has a very tangible reality'. This concrete physical dimension is already detectable at the beginning of the experience, when the participants are escorted to the red room by an actress who they think to be a museum assistant and who starts posing them some questions about their sleep quality since they have arrived in Venice (they are supposedly tourists) and whether it is their first time in the city, or they already know it well. These pieces of information are fundamental for the final part of the performance when visitors exit the room after the experience and, just outside the gallery, they are stopped by an ostensibly random passer-by who asks them whether they can give her some indications to reach a specific street in Venice. Given

that they are tourists, they are not able to satisfy the stranger's request, hence they should leave, except that the passer-by is actually an actress playing her role in the performance. Once again, she stops them by placing her hand on their arm and she utters the words 'Believe in your dreams', namely the final line of the piece and whose meaning concludes the storytelling in a circular way. At this point, participants, still bewildered, realise that it is not an incident happening in real life but a staged episode belonging to Punchdrunk's theatrical exhibition. Between these two scenes that occur on a physical interactional level, there is the virtual experience set in a theatre-like situation – an exact digital replica of the real setting – where users are invited to seat on the swivel chair in the middle of the red room and, after they put the headset on, they are plunged into the very same setting, but this time the initial empty chair in front of them is filled with the first character of the performance: a seemingly frightened woman who frantically starts recounting a horrible recurring nightmare that she is been having lately:

> Hello. Welcome. Thank you for joining me. The curtains of your eyelids are raised, but where is the stage? In your mind or...I have not been sleeping very well. I need to tell you something, something that happened seventeen nights ago, I was having a dream…(*Believe Your Eyes - Punchdrunk*, 2016)

The narrative tension reaches the apex when she progressively approaches participants in the virtual dimension until they feel the grip of her hand on theirs in the real world. At this point another layer of interaction is introduced *in medias res* provoking the element of surprise on the audience. The narrative crescendo continues on this interactive level presenting other live actors that surround users in the physical setting while they are projected virtually within the digital experience, and not only their movements are virtually doubled but their voices as well, synchronising them with the binaural audio of the virtual reality video. They are perceived by participants as ghosts, as hovering presences that increasingly approach them – users in fact hear their steps coming closer – until they finally touch them and make the chair on

which they are seated swivel from side to side. The bedtime story narrated by the distraught woman continues contributing to the creation of a gloomy and foggy atmosphere, enhanced by the change of temperature in the room, which becomes colder: the physical sensation of cold combines with the ghostly landscape displayed in the virtual world as though it signalled some kind of defencelessness on the users' part and as a foreboding of a spectral appearance coming next. The experience culminates with the image of a dark hooded figure, arguably a symbol for Death, that appears in the far distance lifting his arm and pointing at participants who are suddenly touched by Death's finger on their foreheads dictating the end of the virtual piece and possibly a transmission of oneiric information to users.

> We're interested in the digital liminal space and the question of who
> the true performer is. Is it the person watching/listening, or the one
> who has physical contact with you? (Punchdrunk, 2019)

The aim is that of blending the real with the fictional to the extent of not knowing the divisive line between the two realms. This process of blurring the lines is achieved through multiple elements: first and foremost, the dual nature of interaction that bewilders users until the very end of the piece, the sensorial stimuli proceed from both the real and virtual worlds, the language, symbols, and images utilised follow a dream-like logic congenial to immersive experiences that disorient users to the point that they question whether or not the last scene occurs in the real world or it is part of the staged performance. Punchdrunk's distinctive approach to storytelling leads users to process the memories emerging from the story differently. Indeed, they are not vividly and chronologically structured as it may happen with linear narrative, but they are evoked in an impressionistic way:

> The story that the audience will remember often has much more to do
> with shifting atmospheres and the sort of emotional or visceral journey
> that they have been on, not an intellectual story that has a beginning,
> a middle, and an end. (Harkness, 2017)

The general feeling after experiencing Punchdrunk's piece is that it is almost impossible to describe it through words and explain what really happened, it is something that one should definitely see with his/her own eyes. In this sense, Harkness suggests that *Believe Your Eyes* intends to remove users from having an 'intellectual sense of storytelling' in favour of a more sensory narrative where it is the quality of a single word or phrase 'whispered in [their] ears that does the storytelling', or the touch of a character to convey his/her own fright, or a series of images implanted within the language. And of course, it is not just the performers' acting that contribute to user experience, but also the soundscapes that confer 'structure to the space' as well as the VR headset that places participants in a 'vulnerable' condition since they cannot see what is actually happening around them in the real world, therefore they are constantly in a threshold position whereby they are immersed in the virtual environment and at the same time they are attracted by the sensory stimuli proceeding from the outside world. The result is an immersive theatrical piece that prompts participants to interact with characters and the virtual environment and to intervene in the unfolding of the story, a story that intentionally unsettles and disquiets them:

> To me, immersive suggests being thrown into an environment that you feel you are truly living in. We want our work to go one step further and let the audience influence the story and have agency over what happens. What is really important to us is that the audience member's heart is stomping because they feel implicated in what they are doing and that there are high stakes for them, rather than a sense of relaxation because they have been transported into an environment that they understand. It is this idea of taking things a bit further. (Harkness, 2017)

The analysis of the case-studies in this section aimed at outlining the use of the virtual reality medium in different disciplinary sectors, from cinema to theatre, according to the varying interactional degrees. The chapter began

with the lowest interactive level, which is described as observational, in which are included the documentary 360-degree films of *Traveling While Black* and the *Space Explorers Series* by Felix & Paul: in these virtual reality pieces a more conventional narrative is favoured in order to convey educational content while allowing viewers to experience a first-person perspective that immerses them in the different environments presented as they were real characters observing the unfolding of the various stories (mostly delivered through the interview technique). The interactive degree increases with virtual reality art, which introduces a more participatory approach based on the user's activation: in *Lunatick* and *Into Yourself, Fall* the relationship is established between the participant and the environment and it has to do with a more physical and embodied interaction since it relates to the bodily dimension. The users' bodies are put to test through the experience of microgravity, flight, and vertigo: these art pieces allow participants to approach unfamiliar and uncommon conditions that can be experienced only in specific occasions and they do that by boosting the virtual potential in order to have a reaction in the physical realm. *Rising* and *It Will End in Stars* challenge users on a more philosophical level providing them with freedom of choice and action: their decisions impact on the unfolding of the stories presented, their interaction or non-interaction with the protagonists (the artist's avatar in the former case, the grey wolf in the latter) of the pieces influence the experience progression. Furthermore, these characters, if approached, act as portals that transport participants to alternative realms: Abramović's avatar leads participants to a glacial landscape where the second part of the story is displayed, the grey wolf projects them to a temple animated by an arcane goddess and to kaleidoscopic dimensions featuring mythologic figures. The interaction is elevated to a layered structure with the theatrical piece *Believe Your Eyes* where the participatory approach is introduced in both the virtual and physical world. The mixed storytelling mode combines live performance with 360-degree immersive video engaging users in a multi-sensory experience that results in blurring the lines between the real and the fictional: it requires a high level of participation (interacting with actors both in the physical environment of the museum and in the virtual ghostly landscape) and it entails a processual

non-linear narrative that unfolds in a double dimension. Notwithstanding the varying interactional approaches, it is important to signal the individuality of each virtual piece, which is not in fact designed for large masses of audience members but for one participant at a time, meaning that each of them has a singular and different experience where they are free to choose what to look at, how to interact, how to use the physical space provided (whether they wander throughout the environment or remain still in their own spot), whether to privilege some attentional cues over others (e.g. visual over audio), etc. Ultimately, all the case studies follow the three key principles illustrated in the ethnographic study conducted by Google News Lab (2017, p. 9), which presents virtual reality as a distinct narrative medium. According to the first principle of storyliving rather than storytelling, all the pieces employ virtual reality to present stories that users live and experience first-hand that can be regrouped into journeys through space (Earth and the outer space), time (travelling sixty years back), and interiority (in a concrete way through the human body and on a more abstract level through the unconscious and the dream-like dimension). They all use a first-person point of view – and this connects to the second point, namely the perspective shift and enlargement – that allows users to fully immerse in the virtual environment as they were real characters belonging to the portrayed world. By shifting their perspective, participants are left with strong emotional experiences – this is the third and last principle – because they are able to embody different roles and extreme physical conditions: they become the interviewees' interlocutors in the documentary pieces, following them in their stories and journeys; they are allowed to experience flight, the absence of gravity, vertigo and fluidity by being incarnated into a spaceship, a vessel or by even experiencing the lack of a bodily dimension in *Lunatick*, *Into Yourself, Fall* and *It Will End In Stars,* respectively; they can become lifesavers or undergo intense psychological states such as being terrified by the surrounding landscape (the melting of ice polar caps in *Rising*, the ghostly atmosphere of *Believe Your Eyes*). Through three diversified 360-degree storytelling modes – passive (freedom to look around), active (freedom to interact with the virtual environment), and mixed (freedom to interact with both the virtual and real worlds) – all the case studies

place users at the centre of the experience by requiring them to engage with the narrative presented through an invisible interaction (cinematic virtual reality documentaries), an active participation (virtual reality art), and a double interaction (immersive theatre).

6. Conclusion

Due to the premise that virtual reality narratives 'are distinguished from other digital narratives through three-dimensional images, interactive panoramic representations, and the ability to manipulate our experience of our own body' (Ryan 2019, p. 91), the analysed case studies demonstrate that the congenial storytelling approach for virtual reality is the participative model, which fosters interactive and character-centered narratives ranging from observational engagement to sensorially rich stories. Interaction is the groundbreaking element that completely revolutionises the traditional authorial model for narration: the author's control over the story is partially lost in favour of a freedom accorded to users who in fact become real characters of the virtual reality narrative by experiencing and interacting with the simulated world through a first-person perspective. If deployed to their full potential, immersive technologies, such as virtual reality, can be conceived as an extension of the physical world and human body rather than a part outside of it, for they allow individuals to acknowledge and interact with the immediate surroundings. For this reason, their aim is to become an increasingly invisible medium through which participants can have unmediated experiences. According to the global design company IDEO (Mingail, 2016), which focuses on human centred design for immersive content, individuals seek out immersive experiences because they provide them with at least five human drivers: discovery, mastery, creation, empathy, and transcendence. Discovery signals the desire for exploration of a new environment through the senses (mostly sight and hearing, but also touch). This desire is enhanced if the user is introduced to an unknown world and unfamiliar conditions (for instance the vertiginous descent into the human body in *Into Yourself, Fall* or the teleportation to alternative realms in *It Will End In Stars*). Mastery leads to the users' need to master an ability in virtual reality, which however should be a skill built on progress, not immediately acquired, so that they can make various attempts, repeat practice, be involved in the action required, learn until they receive positive feedback, hence they achieve competency (i.e., in *Lunatick* participants find themselves on the Moon surface where they experience the

lack of gravity. There, it takes a couple of minutes to understand how to move throughout the lunarscape avoiding motion sickness in order to boost the bouncing up and down movement while exploring the environment with a supernatural speed). The aspect of creation is strongly connected to the sense of embodiment and the impact users can have on the story-world created. When they can experience presence and immersion within the virtual environment and are able to interact with its elements and characters, they feel they are partaking in the creation and unfolding of the narrative (e.g., in *Rising* they are asked to intervene in the plot development by making an ethical choice that directly impacts on the main character and subject of the experience). Empathy is basically the desire to understand the Other's perspective by identifying with his/her condition and, if transposed to the virtual reality field, it is enhanced by the sense of embodiment that allows users to fully incarnate the other person's point of view. For instance, in *Traveling While Black* the engaging emotional narrative structured on face-to-face interviews shows viewers the specific historical background of movement restriction imposed to the black community in the United States, and it does so by involving participants as they were the interlocutors of the interviewees who share their first-hand experiences. The last element refers to transcendence as the urge to push the limits of sensation, to abandon the known and the ordinary to explore the unknown and transcend oneself. This is made possible through an interplay of senses, scales and perception (i.e., in *Believe Your Eyes* participants use multiple senses ranging from sight to touch acting on a double level of interaction that includes both physicality and virtuality, which are blended to create an eye-opening virtual reality experience). The more drivers are combined within a single piece, the more compelling and appealing the experience is to users. However, it is important to point out that virtual reality represents a support for narrative, a means through which it is possible to convey new forms of storytelling, but it should not eclipse and overcome the story, it should act as a tool used to the advantage of narration. The dialogue between technology and narration should stand for both an adaptive and evolutionary process where they nurture, complement and adapt to each other. As Cometa (2017) suggests,

stories are provided with an adaptive property that allows humans to better cope with reality and, if the current state of society has evolved to such extent that the digital has become an integrant part of human life, then it is also true that modern and new ways of storytelling connected to technology should be supported and explored. Especially in a time where human contact has forcedly decreased and social distancing has become the rule, the introduction of narratives that can bridge the artistic and cultural dimension with the digital realm is tantamount to human experience. Through the use of virtual reality, parallel worlds can be created in order to connect with art and with others by also embodying unfamiliar conditions and gaining new perspectives. The peculiarity of assuming a different viewpoint by being directly exposed to a new context, which in the real world may appear distant or unreachable, is fundamental to humankind in order to elicit empathetic feelings and to grasp the complexity and diversity of situations. That is the case of the virtual pieces considered in the present study, which, considered individually, offer a distinct perspective: from the exploration of the lunar surface and alternative worlds such as Mars (*Lunatick* and *Space Explorers Series*) to the penetrating vision based on a journey through the inside of the human body (*Into Yourself, Fall*) and the human subconscious (It Will End In Stars); from the historical period of the racial segregation in the United States where the user experiences the same civil rights restrictions imposed to the African-American community when traveling throughout the country (*Traveling While Black*), to the real scenario of melting glaciers provoked by climate change and rising sea levels (*Rising*). All these virtual reality experiences, through their interactive and participatory approach to storytelling, allow participants to be involved and immersed in different, perhaps unfamiliar, contexts as they were present and part of them. Virtual reality disrupts the conventional process of linear storytelling whereby the writers/artists/performers have the control on their own story to tell, now users are faced with a dynamic 360-degree space in which a non-linear story is presented and in which they are asked to partake in. New forms of narrative do not imply an erasure of the previous and more conventional modes of storytelling, they can cohabit and coexist without excluding each other.

Individuals should be provided with the choice to be whether passive listeners and observers or active participants, or even both of them, without being influenced by the misconception that one form of narrative is more engaging and compelling than the other. Virtual reality's intersection with the domains of cinema, art and theatre generates a hybrid storytelling medium, which not only detaches from traditional narrative forms, but also from the genre of computer games for which VR first originated. As a matter of fact, videogames tend to prioritise users' play generally employing the same adventurous narrative pattern, which centres on the *hero's journey paradigm* (Propp, 2010), focusing on the gameplay sequence instead of the narrative itself. With virtual reality cinematic, artistic and theatrical works this tendency is reversed for they adopt an interactional approach similar to computer games, yet they combine the five drivers with an aim to induce users' curiosity to explore immersive experiences that are not tied only to the motivation to play, but to the discovery of virtual environments, as well as the generation of empathy from different narratives. This kind of immersive storytelling signals a second wave for virtual reality – the first being in the nineties – due to the fact that both the digital tools, especially the HMDs, and the visual impact have spectacularly advanced to render the experiences increasingly unmediated and realistic. The potential of virtual reality storytelling must be further explored in parallel with the technological advancements in this field, yet, through the case studies presented, VR can be deemed a narrative medium on par with literature, cinema, and theatre. Comparing virtual reality with the afore-mentioned media, books, films and theatrical performances are all marked by narrative immersion, which Marie-Laure Ryan (2019, p. 99) identified with four kinds – spatial, temporal, emotional and ludic –. While traditional storytelling forms present the first three types of immersion at different levels of intensity since they entail spatial descriptions; creation of suspense, flashbacks and flashforwards; generation of empathetic feelings, they all lack the ludic immersion, intended as an interactive concept based on the participants' activation. Therefore virtual reality adds this latter element relying on a narrativity defined by the principles of *experientiality* (Fludernik, 1996) and interactivity that lead users to a *storyliving* experience (Google

News Lab, 2017) where the human imaginative capacity is combined with the technological support of a vivid illustrative and immersive narration.

7. References

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