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Abstract
Creating and experiencing immersive virtual environments with a performative nature designed for Virtual Reality (VR), demand for an artist to face complex and peculiar strategies of embodiment, it needs answering questions related to the relationship between the body in the physical world and the virtual environment and finally it needs addressing the ethical aspect of subjecting participant to a forced disembodiment, that could be quite traumatic for some. The present paper provides a brief introduction to some key questions arisen during the initial steps of my artistic research in the field of audiovisual immersive environments. My attempt is to approach the subject from the experiential, rather than the technological point of view, putting VR in continuity with a tradition of performance and sonic arts, presenting an overview of some of the premises, directions, as well as challenges for a possible approach towards the relationship between human body and machine generated virtual environments in VR.

Author Keywords
Artistic research; embodiment; re-embodiment; disembodiment; immersion.

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Introduction
Although the idea of Virtual Reality (VR) as we understand it today is already some decades old and artistic experimentation is not new with this medium, it is probably only in the last few years that, under the drive of commercial development of affordable devices, it has affirmed itself as a widely available medium for artists. One of the most pervasive advertising strategies in the mainstream discourses around it, is the one claiming that, with the recent advent of the last generation of technologies, we are facing a radically new concept, revolutionary as much as disruptive. Besides the often "forgotten" fact that VR, with only relatively minimal design adjustments (OLED displays in place of cathodic rays tubes and software deformations in place of lenses for instance), has been around already for more than twenty years, some of its conceptual pillars - immersion, virtuality, embodiment above all - have centuries-long histories. It is beyond the scope of this paper to draw an historical overview of these ideas, but from medieval mystery plays, via the baroque trompe-l'oeil, to stereoscopic drawings, to name just few among the most immediately related examples, should already point towards a continuity in the development of such technology. Salter, in his seminal book Entangled, referring to the contemporary spectrum of digital media technology for the arts, underlines opportunely how much, rather than drawing a sharp fracture, new media have been introducing new solutions to extremely old artistic challenges. Illuminating in this context, is the example from Antonin Artaud's the Theatre of Cruelty, which, Salter reminds us, accounts as the first known use of the term “Virtual Reality”. In Artaud writing it refers to the specific reality of theatre, that he understood as an intense bodily immersive experience: "All true alchemists know that the alchemical symbol is a mirage as the theater is a mirage. And this perpetual allusion to the materials and the principle of the theater found in almost all alchemical books should be understood as the expression of an identity (of which alchemists are extremely aware) existing between the world in which the characters, objects, images, and in a general way all that constitutes the virtual reality of the theater develops, and the purely fictitious and illusory world in which the symbols of alchemy are evolved." [8].

Although we might be used to considering VR as something eminently visual, with some form of red line connecting it in the continuum stretching between cinema and video games, it is Salter's merit to have pointed towards another thread passing through the history of theatre, in its more radical expressions. It is in the direction of this second thread, connecting VR to Wagner and Artaud, to the visceral experience of musical theatre and sonic performance, as well as a psychedelic, hallucinatory practices in the arts, that this research is situated. In particular, following Salter's line of thought I am interested to investigate this specific continuity, placing VR in an intersection of music theatre, dance and performance art, forms all characterized by the centrality of the body, spatial and temporal preoccupations and the use of sound in favor of language. In this intersection I am convinced that reside some of the most interesting access points to art forms based on immersion.
A Working Definition for Performative VR
In this perspective, it is important to attempt a preliminary understanding of what it is meant with performative VR. A key concept here is that of event. I intend to use, as a departing point, the radical definition of site-specific real-time artistic creation outlined by Agostino di Scipio around the concept of sound event. In an illuminating paper called Ascoltare l’evento del suono, Di Scipio writes: "(...) the role of technology in the creative processes is not so much about designing and projecting the sound, as something to relocate, displace, move in space (...) rather it is about allowing the interactions through which the sound event happens, in a real time and a real place, as an emergence, inseparable from the specific space and those who dwell it." [3]. As much as it might not seem immediately apparent, the technology he is referring to (the whole of microphones, computers and sound projection systems in a concert hall involved in the event) transforms the space by superimposing a second virtual layer, in a sonic parallel to that of Mixed Reality, where different layers of physical and virtual interact and influence each other. It is in this specific encounter of technology, space and participants, in this intertwining of the real and the virtual that the event happens. The work is guided by three key artistic ideas, acting as some guiding hypotheses: a blurred distinction between performer and spectator, the centrality of the body as a two-way sensory interface to access the experience, in-between passive reception and active agency, and the head-mounted-display (HMD) as a way to alter vision and redefine the relationship with the space around you.

In this event, participating and performing are more extremes on a continuum than mutually exclusive concepts, as more or less deliberate choices from both parties can influence its result. Various degrees of interactivity strategies need to be at play, in order to guarantee the specificity of the experience to unfold, and the interface of these strategies needs to be, as illustrated by Slater and al. an embodied one (cf. Kilteni, Groten, Slater, 2012). In this sense, it is especially important to underline that in the case of a technology such as VR, whose working mechanism is explicitly to pose itself as a prosthetic extension of our body, the whole idea of what the body is needs to be put into question.

The Problem of The Body in VR
VR technology is seeing application in extremely diverse fields of activity, from medicine (cf. for ex. McCloy, R., & Stone, R. (2001). Virtual reality in surgery. BMJ: British Medical Journal, 323(7318), 912–915.) to chemistry (cf. Ihlenfeldt, WD. J Mol Med (1997) 3: 386) to military (cf. https://www.vrs.org.uk/virtual-reality-military/) and architectural simulations (cf. https://www.aecmag.com/59-features/1166-virtual-reality-for-architecture-a-beginner-s-guide). In the mainstream culture, though, video-games and 360° (or VR) cinema, through commercial Head Mounted Displays (HMD) are probably the most common form in which VR technology is available to the large public, including artists. The main perspective of these experiences is focused towards creating what is called Place Illusion (π), which Slater defines as "the illusion of being in the virtual place even though you know for sure that you are not there." [9]. In the case of virtual environments such as those delivered by video-games or 360 video,
however, this "plausible illusion" or simulation, is eminently directed towards sight and only secondarily towards hearing, leaving the relationship to the whole of the body inside and outside of the virtuality-reality border with extremely little problematization. Although there are technological limits that could justify this situation, there are also ideological aspects nourishing these ideas, that should not be overlooked. As Ken Hillis put it in his Digital Sensations in 1999, "Virtual technologies encourage beliefs that they constitute a "transcendence machine" within which the imaginative self might escape its privatized physical anchor and live in an iconography of pleasure." [4]. Erkki Huhtamo adds that "the immersive experience is usually interpreted as an out-of-body experience, and as such it perpetuates the persistent Christian-Cartesian split between mind and body." [11]. It is my interest to bring to the open the problematicity of embodiment in VR.

**What Embodiment and Whose Body?**

Embodiment is clearly a crucial concept in the current discourse around media technology, and, spanning through disciplines, it is serving as a theory net between anthropological, philosophical and scientific thinking (cf. Kimmel, 2008). At its root, as described by Varela, there are two assumptions: "first that cognition depends upon the kinds of experience that come from having a body with various sensorimotor capacities, and second, that these individual sensorimotor capacities are themselves embedded in a more encompassing biological, psychological and cultural context." [12]. Slater et al, defines the sense of embodiment (SoE) in a virtual environment as being constituted of three subcomponents: "the sense of self-location, the sense of agency, and the sense of body ownership.", which are all essential features of being embodied in our own "real" body. From there, asks Slater, "how, and to what extent, can we experience a virtual body representation as our own body within a virtual environment?" (Slater, Perez-Marcos, Ehrsson, & Sanchez-Vives, 2009). My artistic hypothesis, here, is that to produce a "second order" embodiment, as it is required in a virtual environment, it is actually more about redefining and reimagining the body, than merely reproduce "actual" sensorimotor contingencies in a presupposed "normal" virtual body. And this probably stays true, even when the attempt is to look for realistic simulations, as it is the case in VR social media or video-games. Moreover, with a still extremely limited ability to reproduce all of these subcomponents in today's incarnations of VR, (i.e. limited or non-existing agency, extremely limited to non-existing sense of body ownership), I am wondering if it wouldn't be more appropriate to investigate the specificity of VR not in terms of a medium to host a credible body representation in the virtual world, or in terms of an illusory double of this reality, but on the contrary in terms of how it already can blur or modify our SoE altogether. If for Slater the interest is in seeing how VR makes possible "the manipulation of the body representation in terms of structure, morphology, and size, dissociating the egocentric visual perspective from the body, and exploiting the role of multimodal information in spatiotemporal terms for body perception" [5], for the sake of this research the question is rather what the (virtual) reality of the body could be in VR altogether. Asking how we can simulate a credible representation, since the body in a virtual environment is not a neutral immediately given concept, doesn't really take into consideration what this representation might be about. It is the very idea of
body to be virtual, potential and thus artificial when we put on an HMD. “Entering” the VR goggles, to a certain extent, is undergoing a process of partial dis-embodiment first, of which motion sickness is the first symptom (the HMD, hijacking our ability to see and operate “normally” in the world) and of re-embodiment secondly, in a virtual body, whatever it is, with a network of artificial sensorimotor capacities obtained though manufactured prosthetics. Not exhibiting this artificiality, with all the account for partiality and all sort of biases, in the era of mass standardization, risks to mean also conforming to one standard pre-conceptual idea of the body. (cf.
https://virtualrealitypop.com/embodiment-and-the-boundaries-between-us-in-virtual-reality-d03ef0f25575, last retrieved March, 2018) It is in this context of that an artistic exploration of these ideas, seems to me extremely interesting. If embodiment in this context means creating artificial prosthetics to be interface between the real and the virtual world and it is always a re-embodiment, then artistic experimentation is the perfect mean to bring these issues to light, where perceptive dissonances and alternative re-embodiments could be the block to build upon, with a critical outlook, alternative and possibly conflicting with the ideology of commercial hype.

Examples Against the Out-of-the-Body Simulation
It is in the context of these commercial devices, the split discussed above between this body-less pair of eyes and ears, and the physical bodies they belong to, somewhat abandoned in a different dimension altogether, offers already an incredibly rich set of potential artistic explorations, that seem to be under-represented in the new wave of VR. Furthermore, it seems to me that the most peculiar novelty aspect of the current state of technology development resides specifically in the quality of dis-embodiment if provides. A choreographed stimulation, displacement or constriction of the real body, concurrently with the virtual stimuli, or carefully orchestrated audio-visual feedback strategies between real and virtual, can offer already a rich stage for a performative approach to VR, and will be the base of my artistic production to come. As guiding examples, I will here show three existing artworks, that in different ways had showed me a possible direction, in a possible interstitial place, between low-tech hackings and ideological hijacking.

First, already in the 1995’s piece Osmose by VR pioneer Char Davies, an almost alien re-embodiment process takes place [2]. In order explore a metaphysical virtual ecosystem, far from realistic, breathing and shifting balance is the strategy to move about, float and plunge in the virtual world, in an artistically mediated metaphor of diving techniques.

In the VR piece The Machine to Be Another by BeAnotherLab, “an interdisciplinary group dedicated to the understanding of the self and its relation to the other”, a dual experience for one viewer and one performer [1]. Through a prosthetic camera placed at head level on the performer, moving according to the head tracking coming from the headset, the viewer in the virtual world is re-embodied in the body of the performer, which in a clever mirror game is forced to mimic the movements of the participant using the goggles, in order to sustain the illusion.

But the perception or redefinition of the self is not the only aspect to be taken into account in this idea of
immersion, the relationship between one’s self and the environment is another key aspect to be investigated. There is an extremely interesting tension produced between real and virtual environment.

A very interesting artistic example, where this tension becomes evident, is Salter’s own recent immersive piece, Haptic Field, done together with the interdisciplinary artist TeZ [7]. Although strictly not a Virtual Reality experience, at least not one perceived through conventional goggles, but rather through a as sophisticated as simple strategy of sense-bending by “low-tech” information subtraction (i.e. wearing blurred glasses and a onesie overall with actuators and lights), it is an extremely interesting attempt to redefine the idea of immersion as separated from that of illusion. Inside the immersive space, the visitors are free to roam around a hard-to-map space, in an impenetrable fog produced by a pair of blurred eyeglasses they are equipped with. The world around you made of ghostly lights and an otherworldly slow music. The spatial awareness as well as the ability to recognize anybody else, reduced to glowing shadows around you, "seemingly indifferent to your presence as they drift by." (cf. K. Doyle, http://www.berlinartlink.com/2017/07/08/exhibition-chris-salters-haptic-field-in-immersion-program-at-martin-gropius-bau/, last retrieved March 2018) It is this form of embodied impairment, this redefinition of the horizon of the body itself, that allows for the experience to take place, not an illusory, but literally a different, alternative, virtual reality to explore.

Agency/Control
The last aspect that I would like to mention in this journey to immersion and VR is the problematic relationship between agency and constriction. Probably it is true of every artistic experience of being a specific form of voluntary “subjection” to the aesthetic experience that is manufactured or facilitated by some form of “authorial” agency. In VR, though, the boundaries between agency and control are even weaker and more plastic, given its exploratory character on the one hand and the invasiveness of HMDs or the headphones, being hearing a sense for which there is no possible withdrawal (In this regard the work Re-Wired / Re-Mixed of bio-artist Stelarc is a paradigmatic exposition of this idea [10]). Every immersive experience is in fact a deliberate loss of control, accepting to being exposed to a form of soft violence towards our perception. We are exposed, disregarding whether or not we believe the experience to be “real”. We are doubly subjected and vulnerable while exposed to the fabricated stimuli in the virtual world, at the same time and as much as our real body, while immersed, is exposed to the sight and touch of other “real” agents around us that have no presence in the virtual world. I recall a nearly horrific experience of being “inside” a VR piece during a crowded opening in a small gallery space. The feeling of people being able to see me while I could not see them, as well as their seemingly careless way of dribbling my unaware body abandoned in the real world with little control over even its own movements, clearly made me aware of the necessity to bring to discussion the subject.

Conclusion
I have given an introduction of a certain number of question, related to VR as artistic mean of expression, that I have, as a practitioner, encountered and found problematic as much as fascinating. Openly reflect and discuss around these topics seem to me the most
promising development path, from an artistic point of view. Transforming the virtuality in something happening in a specific physical place and time, giving actual boundaries to virtualized bodies and abstract spaces, giving back flesh to a disembodied medium, I believe could help taking an alternative stance in relationship to mainstream VR, but the work is still in an initial phase to be able to draw anything conclusive.

References