ISSN 2529-9824

Research article

Virtual Reality – revisiting taxonomies for mixed reality performance

Realidade Virtual – revisitando las taxonomias para la performance en realidade mixta

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Receipt Date: 22/05/2024

Acceptance Date: 30/10/2024

Publication Date: 04/03/2025

How to cite the article

Gomes, C. (2025). Virtual Reality – revisiting taxonomies for mixed reality performance [Realidade Virtual – revisitando las taxonomias para la performance en realidade mixta]. *European Public & Social Innovation Review*, 10, 01-15. https://doi.org/10.31637/epsir-2025-1928

Abstract

Introduction: During the pandemic, the arts adapted to the virtual possibilities of the internet, with mixed reality gaining attention once again. This article revisits the concept of mixed reality, particularly in the context of digital performance theory, specifically cyberformance. **Methodology:** The study employed bibliographic review, critical analysis, and observational research of artistic cases (the researcher as artist) to test the hypothesis that cyberformance inherently embodies mixed reality by merging physical and virtual spaces, even in online presentations. **Results:** The study explored Benford and Giannachi's view on mixed reality performance (MRP), revisited Milgrim and Koshino's Virtuality Continuum, and examined digital performance models proposed by Birringer, Causey, and Schrum. Taxonomies for understanding cyberformance were analyzed, highlighting their limitations in capturing its fluid and evolving nature. **Discussion and Conclusions:** While taxonomies offer useful frameworks for cyberformance, they often fail to fully encapsulate its evolving, fluid nature. The study emphasizes that the significance of cyberformance goes beyond traditional categories, making it a complex and dynamic field.

Keywords: Cyberformance; Mixed Reality Performance; Virtual Continuum; Virtual Reality; Augmented Reality; Digital Performance; Virtual Environments; Cyberculture.

Resumen
Introducción: Durante la pandemia, las artes se adaptaron a las posibilidades virtuales de Internet, y la realidad mixta volvió a acaparar la atención. Este artículo revisa el concepto de realidad mixta, en particular en el contexto de la teoría de la performance digital, concretamente la ciberformance. **Metodología:** El estudio empleó revisión bibliográfica, análisis crítico e investigación observacional de casos artísticos (el investigador como artista) para poner a prueba la hipótesis de que la ciberperformance encarna inherentemente la realidad mixta al fusionar espacios físicos y virtuales, incluso en presentaciones en línea. **Resultados:** El estudio exploró la visión de Benford y Giannachi sobre la performance de realidad mixta (MRP), revisitó el Virtuality Continuum de Milgrim y Koshino y examinó los modelos de performance digital propuestos por Birringer, Causey y Schrum. Se analizaron taxonomías para entender el rendimiento cibernético, destacando sus limitaciones para captar su naturaleza fluida y evolutiva. **Discusión y conclusiones:** Aunque las taxonomías ofrecen marcos útiles para el ciberdesempeño, a menudo no logran encapsular plenamente su naturaleza fluida y cambiante. El estudio subraya que el significado del ciberdesempeño va más allá de las categorías tradicionales, convirtiéndolo en un campo complejo y dinámico.
Palabras clave: Cyberformance; Mixed Reality Performance; Virtual Continuum; Realidad Virtual; Realidad Aumentada; Digital Performance; Entornos Virtuales; Cibercultura.

1. Introduction

During the pandemic the arts, even the mainstream ones, bent to the virtual possibilities of the Internet. At a time when virtual reality, with its gadgets, such as headsets and goggles, is once again in the spotlight, it is opportune to revisit the concept of mixed reality, alongside the taxonomies associated to it, within the context of digital performance theory, and more specifically, cyberformance.

Cyberformance is performance art that links physical spaces with virtual worlds, environments and platforms, characterized for being live, mediated, intermedial, multimodal, hybrid, liminal, collaborative, aesthetically and socially interventive and being low cost while using freeware technology (Gomes, 2016, p.375).

In the ever-expanding realm of digital art, cyberformance emerges as a hybrid practice, bridging the tangible and the virtual in dynamic, non-immersive environments. With roots dating back over three decades, cyberformance stands at the forefront of innovation, pushing the boundaries of performance art in the digital age and, currently, it is a reference for mainstream arts and those exploring the internet for artistic purposes.

The objective of this study is to delve into the intricate relationship between cyberformance and mixed reality performance (MRP), examining the ambiguous nature of "mixed reality" and its implications for virtual experiences and illuminating the interconnectedness of physical and virtual spaces within these artistic endeavours.

Through bibliographic review, observational research and critical analysis, the paper argues that cyberformance inherently embodies mixed reality, merging physical and virtual spaces, even when presented exclusively online.

By participating in artistic actions, such as performances held in the platform UpStage and the mixed reality collaborative ongoing project *Senses Places* (participated by the author), as well as other experimentations in MRP, I analysed how cyberformance intertwines actions in physical and virtual environments.

Furthermore, this text explores Steve Benford's and Gabriella Giannachi's perspective on MRP, emphasizing the complex relationships between physical and virtual spaces and the integration of digital media based on rules akin to computer games in contrast with the creative freedom and open participation in cyberformance.

The discussion navigates «back into the future» while revisiting the Virtuality Continuum, a taxonomy proposed by Fumio Kishino and Paul Milgram, classifying the stages between physical and virtual environments. Additionally, it contrasts the paradigms of virtual reality and ubiquitous computing, demonstrating how MRP combines elements from both realms.

This paper also discusses diverse models and typologies proposed by Johannes Birringer, Matthew Causey and Steven Schrum, integrating insights from contemporary digital practices but, ultimately, it becomes evident that the fluidity inherent in cyberformance challenges rigid classifications.

Through detailed analysis and examples, the text offers insights into the evolving landscape of performance art in the digital age, emphasizing the importance of delving deeper into the complex interplay between technology, space and human interaction, paving the way for novel paradigms in our current understanding and engagement with virtual reality.

As we navigate this multifaceted terrain, our aim is to unravel the complexities of cyberformance, offering insights into its transformative potential and paving the way for a deeper understanding of its role in shaping the artistic landscape of the 21st century.

2. Methodology

Cyberformance is an example of a hybrid multimodal practice that converges de actual and the virtual in non-immersive non-simulated environments reflecting upon the technological conditions of its own production and taking distance communication, in general, and performance art, in particular, further (Gomes, 2015).

I think that these experiments that have been developing for more than thirty years can be a reference for the mainstream arts and for all those who are now embarking on the use of virtual environments for the arts and beyond.

Cyberformance connects remote performers and audiences. Chat rooms and Multi User Dungeons (MUD) where the first cyberspaces where this artistic practice took place. However, soon it transited into graphic environments (The Palace) and virtual worlds (Multi User Virtual Environments or MUVE like Second Life) even creating its own platforms and festivals (UpStage, Odyssey Performance Art Festival).

Based on my own artistic practice on the referred contexts, on observational research and on bibliographic review of academic research on cyberculture and digital performance, a decade ago, I created a theoretical framework by working on an updated definition of the term cyberformance coined by Helen Varley Jamieson (2008) for a better understanding of this artistic genre (Gomes, 2015).

Thus, the findings in this article result from a methodology crossing bibliographic review and critical analyses based on my ongoing experience of almost 20 years as artist-researcher in the context of cyberformance. Since 2010 I have been collaborating with the ongoing

mixed reality project Senses Places (created by Valverde & Cochrane) and I developed collective performances using UpStage, as well as being a tester of the software of this platform for cyberformance.

When the creative and experiential process itself serves as the foundation of our research, discerning what is significant in such practice can be challenging. This difficulty is compounded by the fact that conventional academia often dismisses experiential knowledge unless it is mediated by ethnographic studies or other methods that qualify, quantify, and classify such experiences. I contend that the creative actions involved in the construction of cyberformance can be described and analyzed, but are challenging to measure or categorize.

Following the advisories of Piérre Lévy (1997) and Axel Bruns (2008) regarding rigid taxonomies, I ventured to develop a typology for this emerging genre of performance, whose types are hybrid and are based upon the word, the code and the body (Gomes, 2015, p. 225). However, I deliberately avoided classical social science methodologies involving surveys, samples, content analysis, numbers, and statistics. Indeed, the very attempt to develop a theory for cyberformance represents an effort to affirm the existence of an identifiable, cohesive genre within the field of digital performance art. This effort seeks to establish a "class," yet without imposing narrow constraints or a rigid framework, recognizing the open, hybrid, and liminal nature of this practice.

Given the aforementioned precautions and intentions, I found that a methodology related to action research, reflective practitioner methodology, or practice-as-research was appropriate for this "lived" study. Engaging in cyberformance is the ideal way to understand the process of this performance, its tools, modes of participation, aesthetic concerns, and shortcomings. While I may lack the distance necessary for participant observation in anthropology or the precision of laboratory science, I found no better method for deeply understanding this art form.

An interesting methodological perspective is expressed by the "research in the wild" approach adopted by Steve Benford and Gabriella Giannachi (2011), which involves triangulated research guided by artistic activity intersecting with theoretical abstraction and ethnographic studies. In this specific case, following, recording, or interviewing cyberformance participants and systematizing those data was not advantageous. However, my own participation and observation of others' actions provided sufficient information to address the issue of participation, supported by existing theory on the topic.

2.1. Mixed Reality Performance versus Cyberformance

Cyberformance has a direct relationship with mixed reality performance (MRP), which is performance in or of mixed reality. Before delving into this relationship, it is important to clarify the ambiguous nature of the term "mixed reality," which might imply that the virtual realm is a separate reality, distinct from the one where our bodies reside. This would contradict the argument that the virtual is real and that inhabiting virtual worlds has real consequences. Any cyberformance based on text, graphics, code, or even the body, presented exclusively online, is always a mixed reality performance. This is because it inevitably merges physical space—the space of the flesh—where both the performer and the audience are located, and the virtual space where they meet. The "mixing" of spaces is intrinsic to cyberformance, even when presented exclusively to a virtual audience, as evidenced by the fact that behind every avatar, there is always a human in a physical location. The discussion

on the effects of the separation/convergence of the real and the virtual on identity, the body, and even consciousness would be moot if the reality we live in when inhabiting virtual environments were not, precisely, a mixed reality (Gomes, 2016).

However, the term mixed reality has generally been used in the arts to describe actions that happen simultaneously in both spaces, for an «intermedial audience»[1] (Jamieson, 2008, pp. 68-80), intersecting proximal and distant audiences. Many cyberformances intertwine actions occurring in the physical and virtual worlds, transmitted via live video streaming, in one direction or both (e.g., Gazira Babeli's *Acting as Aliens*[2], Avatar Body Collision's *Swim*[3], *Senses Places*[4], or Stelarc's 3D installation *Extract/Insert*[5]). In these cyberformances, actions on one side are projected and provoke reactions on the other side and vice versa. Therefore, it is well established that cyberformance encompasses mixed reality performance. Nonetheless, it is useful to characterize mixed reality performance and explore what it offers to cyberformance, even though most theory in that area is closely linked to digital games.

Figure 1.

Make-shift (Jamieson, Crutchlow, 2013). In the centre of the platform for cyberformance Upstage *2D avatars, photos, live drawings or videos are shown. On the left is the image from the cameras of the performers, each in a family house in different parts of the world. On the right is the text box through which the online audience participates*

Source: https://www.creative-catalyst.com/make-shift/

Mixed reality performance also mixes the real with the virtual and combines live performance with interactivity (Benford and Giannachi, 2011, pp. 1). In this sense, there is indeed a coincidence with cyberformance. The MRP cases considered by Steve Benford and

[1] Drawing on Chapple and Kattenbelt concept of Intermediality (2006) Helen Varley Jamieson (2008) introduced the concept of the «intermedial audience» constituted by the overlapping of audiences in physical spaces or venues with audiences participating through the Internet.

[2] http://gazirababeli.com/actingasaliens.php. Accessed 01-07-2024.

[3] https://www.creative-catalyst.com/abc/swim/swim.html. Accessed 01-07-2024.

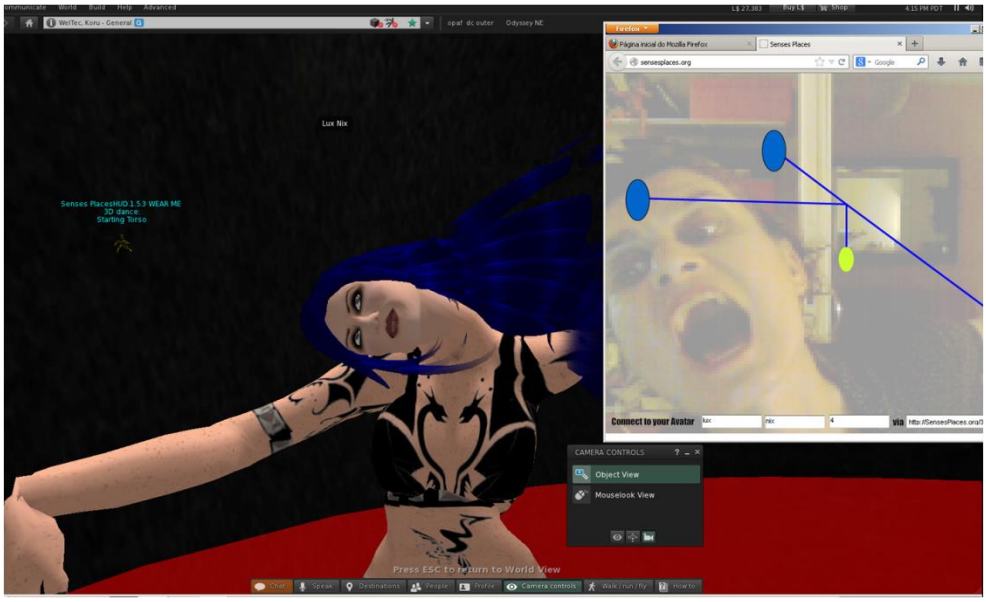
[4] http://sensesplaces.wordpress.com/. Accessed 01-07-2024.

[5] https://www.a-n.co.uk/reviews/extractinsert/. Accessed 01-07-2024.

Gabriella Giannachi in *Performing Mixed Reality* establish complex relationships between multiple physical and virtual spaces; they use network connections to create distributed structures, forming a global stage; they integrate live performance by authors and audiences using digital media based on rules found in computer games; and they create rich temporal structures where the artistic experience is intertwined with daily activities (Benford and Giannachi, 2011, pp. 1). Examples like the work of Blast Theory[6] illustrate this concept. As observed, this definition considers performance inspired by computer games, with their specific rules. However, cyberformance is not a game and does not provide spectators/participants with specific rules and objectives. Sometimes participants receive instructions, such as links to join the performance or obtain programming for their avatar, but often it is enough to be in the right place at the right time. In physical spaces, participants can dance with performers (*Senses Places*) or make kites from plastic bags (*make-shift*[7]) but only if they choose to. Generally, there are few rules, and there is no script to follow strictly to achieve a final goal.

Figure 2.

Senses Places (Valverde & Cochrane) ongoing participative mixed reality project (2010-2024) uses several interfaces (motion tracking; remote of gamming consoles; wearables; video streaming). Here we see my avatar animated by motion tracking with the laptop webcam. Wearables capture breath and heart beat and translate them into colours in the virtual environment



Source: Own elaboration.

Another aspect of Benford and Giannachi's definition of MRP that does not align with cyberformance is the fact that this one does not occupy everyday time but has a time set aside for it — a moment of spectacle occurring on an online platform and on one or several physical spaces. It is, as previously defined, a somewhat "theatrical" moment involving a willing suspension of disbelief, which does not intertwine with daily activities. However, cyberformance intersects with those authors' definition when they state that mixed reality performance can simply be defined as "the staging of theatrical performances in mixed

[6] https://www.blasttheory.co.uk/. Accessed 21-06-2024

[7] https://www.creative-catalyst.com/make-shift/. Accessed 22-06-2024.

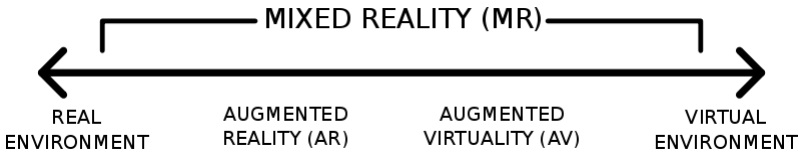
reality environments" (Benford and Giannachi, 2011, p. 2) with a caveat regarding the expression theatrical — cyberformance is not classical theatre.

2.2. The Virtuality Continuum

To further explore the nature of mixed reality, we can utilize the taxonomy of Furnio Kishino and Paul Milgram (1994), which includes a virtuality continuum covering a spectrum of different forms, from purely physical and real environments on one end to purely virtual environments on the other. Between these extremes lies augmented reality on one side — physical environments with various layers of digitalization — and augmented virtuality on the other, where virtual environments contain multiple layers of physical information.[8]

Figure 3.

A Taxonomy of Mixed Reality Visual Displays (1994) *Kishino and Milgram introduced the notion of the virtuality continuum (represented above) and the term mixed reality.*



Source: Own elaboration.

One example at the first extreme is Wikitude[9], a commercial application that enables the augmentation of physical spaces through geotagging, and an example at the other extreme is live audio-video streaming from the physical space to any virtual environment, like a MUVE (a virtual world like Second Life, for instance).

This need to classify, to frame through a taxonomy, is evident in several attempts to define mixed reality performance as it is in defining digital performance in general, as we will see in the following section. In many examples of (MRP) used by Benford and Giannachi, physical and digital objects coexist and interact in real time, occupying multiple points along the Kishino and Milgram continuum. These combinations involve real and virtual environments that overlap in layers but can also be spatially adjacent, in the sense that participants can move from one to the other. In other words, these spaces can be traversed but remain separate, even when forming part of the same mixed reality environment. Therefore, while the virtuality continuum continues to be a useful means to understand the relationship

[8] «The conventionally held view of a Virtual Reality (VR) environment is one in which the participant-observer is totally immersed in, and able to interact with, a completely synthetic world. Such a world may mimic the properties of some real-world environments, either existing or fictional; however, it can also exceed the bounds of physical reality by creating a world in which the physical laws ordinarily governing space, time, mechanics, material properties, etc. no longer hold. What may be overlooked in this view, however, is that the VR label is also frequently used in association with a variety of other environments, to which total immersion and complete synthesis do not necessarily pertain, but which fall somewhere along a virtuality continuum. In this paper we focus on a particular subclass of VR related technologies that involve the merging of real and virtual worlds, which we refer to generically as Mixed Reality (MR)» (Kishino and Milgram, 1994, pp. 1321-1329).

[9] https://www.wikitude.com/. Acessed 26-06-2024.

between reality and virtuality, a more rhizomatic model would allow the real and the virtual to be juxtaposed or layered rather than merely opposed (Benford and Giannachi, 2011, p. 4). Many mixed reality performances use mobile technologies and embed computer interfaces in everyday objects and artifacts, leading to the idea of ubiquitous computing (ubicomp).

As early as 1991 in *The Computer for the 21st Century*, Mark Wieser spoke of 'embodied virtuality' as the phenomenon whereby the virtuality of readable computer information is brought into the physical world (pp. 20). He stated that computers would become "invisible and networked ubiquitously" and predicted that people would use computers "unconsciously to perform everyday tasks" (pp. 20-21)".

In other words, this author predicted that people would begin to use computers unconsciously in their daily lives, which indeed happened years later. This vision of ubiquitous computing contrasts with the initial idea of Virtual Reality. Thus, in the former, the virtual is embedded in the real, while in the later, the real (ourselves) is embedded in the virtual. Ubiquity and immersion are therefore two opposing forces pointing to the extremes of the continuum. However, many mixed reality performances combine both, sharing and contrasting perspectives between them or moving between them during the performance time, thus being hybrid forms.

Benford and Giannachi allege that the virtual reality paradigm and related theories of presence focus on going 'beyond the screen' to become immersed in a computer-generated virtual world, as observed in the diffusion of interactive computer games: "Ubiquitous computing, which was initially framed as the antithesis of virtual reality, considers the explosion of computing from out of the desktop into the every day world around us, broadly encompassing a variety of other ideas such as mobile, wearable, tangible, pervasive, embedded, and ambient computing. Mixed reality performances tend to combine both these approaches"(2011, p. 13).

For these theorists mixed reality performances align more closely with Milgram and Kishino's definition of mixed reality, which, has we have seen, considers a continuum is the best way to capture this relationship between immersion and ubiquity (Benford and Giannachi, 2011, p. 13).

Thus, according to these two authors, although the computer remains the most common interface today, there are actions that project 'through the screen' and 'beyond the desktop' toward immersion in computer-generated virtual worlds, with the best example being interactive games. Once again, linked to game theory, we must contrast this vision with cyberformance, which does not aim for transparent immersion hiding the technology, imposes no rules, has no final objective, and allows participants a high degree of freedom, unlike networked games/performances, which are thematic and based on role-playing.

In this aspect, Senses Places is paradigmatic because it precisely uses technology adapted from the gaming world (e.g. the Wii remote control), wearables (a belt with sensors capturing heart and respiratory rhythms) and ambient computing (meteorological data embedded in the virtual environment) to enable performers and participants to create an environment and choreography of random gestures in a creative and free manner.

Figure 4 and 5.

Extract/Insert (Chafer, Upton and Stelarc, 2012). Visitors to the Herbert Gallery talk and dance with «holographic» 3D and infrared projection of avatares in Second Life. In this MUVE, avatars interact with the projection of the visitors

Source: https://youtu.be/vKanHILj6X4?si=a2Sk4XNXpI1uSu5Q

Ultimately, cyberformance includes coexisting modes of performance, as we saw at the beginning of this chapter, meaning it is multimodal and, in this sense, intersects with mixed reality performance. However, an essential condition for the former, not necessarily present in the latter, is that it is developed on the Internet. In other words, cyberformance can take place as a mixed reality performance but involves participation via the Internet, which is not necessarily implied in the MRP concept by Benford and Giannachi. They consider some performances that bridge physical space with networks but these are not public and freely accessible and usually were created exclusively for the performance/game, as in the well known *Uncle Roy All Around You* (2003-2013)[10] by Blast Theory and similar works by this group.

2.3. Other taxonomies for digital performance within VR

In the preceding section, we examined how the taxonomy created by Kishino and Milgram for mixed reality, through its Virtuality Continuum, can be operative in understanding and

[10] https://www.blasttheory.co.uk/projects/uncle-roy-all-around-you/. Accessed 28-06-2024.

defining digital performance (and cyberformance within it). Several scholars have emphasized the importance of a taxonomy for this kind of performance or have attempted to classify or categorize it.

As early as 1998, Johannes Birringer, choreographer and theorist, defined four models for interaction in digital art. The first model is characterized by clicking a mouse or touching a screen in computer-based multimedia projects, which are comparable to video installations or intermedia exhibitions and may include user access to the Internet: "The screen/monitor or its projection remains the primary surface of information, although hypertext or hypermedia formats imply a nonlinear and non-sequential information structure that is unlike the performance experience in real time, especially since hypermedia is digitalized information allowing the user to manipulate it in ways that are not possible for the viewer of a performance in real space" (Birringer, 1998, p. 121).

In the second model, the extension to the Internet implies distance and spatial separation. Telemedia circuits connect locations and enable interactivity that is not unidirectional, like television, but involves feedback: "Reciprocity opens the possibility of altering and transforming the terms of reference of the exchange; multiple connections between sites create greater turbulence and dynamism among the connected surfaces" (Birringer, 1998, p. 121).

To characterize this model, Birringer uses Paul Sermon's well known *Telematic Dreaming* (1992)[11], in which two installations—each with a bed and a television—are connected via videoconference. The participating audience sees themselves lying next to the projected reflection of the person lying in the other installation, miles away. The performance is created by the interaction of each participant with the other's reflection.

A third model opens the possibility of having a stage performance in a specific location for a certain audience, while involving other artists via the Internet so that webcam video images, sound samples, and texts can be integrated into the closed-circuit broadcast in real space. The real space is, in turn, filmed and projected on the Internet: "The choreographer becomes a virtual DJ" (Birringer, 1998, p. 123). A seminal example is *M@ggie's Love Bytes* (1996-1999)[12], a dance-theatre performance happening in multiple spaces, which, when staged in a Copenhagen nightclub, involved artists from other parts of the world, from San Francisco to Tokyo, adding music or video, turning the show into an "electronic patchwork quilt" sewn by various collaborations.

"Finally, a fourth model of digital art would remove the intersection of actual and virtual performance and place interactivity inside immersive virtual environments", wrote Birringer in 1998, stating that this was only achieved through virtual reality props like gloves, helmets, and goggles connected to the computer to simulate the experience of spatiality produced for the eyes and ears (pp. 123-124). It is noteworthy that at that time, MUVE such as Second Life or other virtual worlds had not yet emerged. Today's cyberformance would involve all these forms referred to by Johannes Birringer in 1998.

In *Theater and Performance in Digital Culture*, theorist Matthew Causey also attempted a typology for digital performance, referring to the "variables and possibilities" of cyber-theater or computer-aided theater (2006, pp. 48-49).

[11] https://www.paulsermon.org/dream/ and https://vimeo.com/44862244. Both accessed 28-06-2024.

[12] http://www.liveart.org/motherboard/MLB/. Accessed 02-07-2024.

The first is «digital scenography», which includes three-dimensional projection while actors perform in front of spectators with special glasses, as in the George Coates Theatre Works, in San Francisco, or the Institute for the Exploration of Virtual Realities at the University of Kansas.

Televisual staging occurs in the traditional theater space augmented by video monitors and live and recorded image projections, as in the work of The Wooster Group (USA), Robert Lepage (Canada), or dumb-type (Japan).

Telepresent performance, through videoconference and the Internet, includes performances taking place in different locations and presented in both physical and virtual spaces. Another possibility for "computer-aided theater" is allowing the audience interactive access to the performance with hypertextual, sound, and image databases, where audience members can access and even direct the performance. Causey does not use this example, but Stelarc's *Movatar-Inverse Motion Capture System* (1997-2002) fits this type of performance. In it the online audience chose one of six points in Stlearc's avatar and this one actuated de physical body of the performer. An heir to this performance was *Involuntary, Improvised and Avatar Arms* (2012). In a physical venue Stelarc was animated by his Second Life avatar Stelarc Luic.

A "promising" category for Causey in 2006 was the intelligent environment where objects, clothing, and the environment itself, through sensors, respond to the presence of actors and spectators, triggering projections or activating stage machinery. There are several examples of this type of interactivity, from installations like Michel Gondry's or Bill Viola's (where, for example, video images of sleeping bodies on the ground move when stepped on) to wearable technologies, like the *cybersuit* from The Automated Body Project (2002) by Yacov Sharir[13], or the common stage-integrated sensors found in many performances today.

Causey continues to define variants such as tracking technology, created through sensors in the performer's clothing or body connected to a computer that processes the information in real-time and animates a figure projected onto the actor's body or a screen.

For the author, augmented reality is used to allow the audience, wearing special glasses or HMD (Head-Mounted Displays), to see and hear information overlaid on a live performance. Virtual reality, according to Causey, involves using an HMD helmet and navigation gloves to traverse virtual environments and interact with synthetic characters, creating our own avatar.

Finally, for this author, there is "performance within virtual environments" (MUD, Multi-User Dungeons, and MOO, a Multi-User Dungeon Object Oriented), which are "electronic environments (…) wherein groups of individuals through Internet connections develop characters and scenarios, while forming virtual communities through improvisational performance" (Causey, 2006, p. 49).

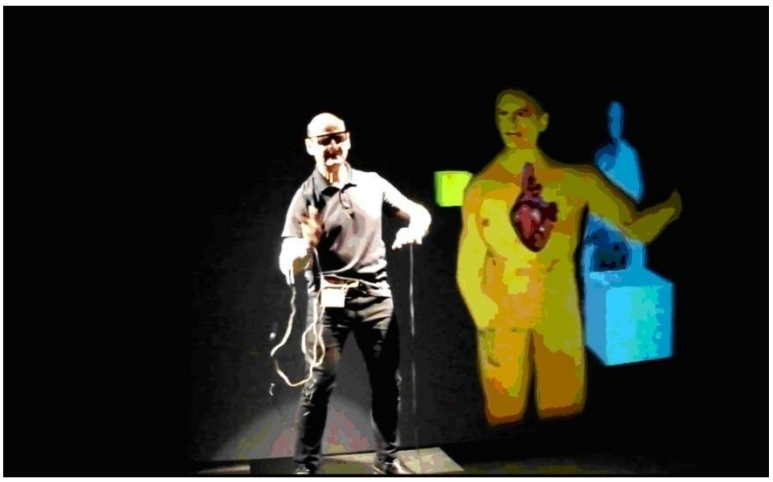
It is in this last category of Matthew Causey that we place cyberformance, although it can coexist with all the others. Stephen A. Schrum, is another scholar that proposed a taxonomy for digital performance, defining eight areas, from "traditional" theater — dramatic production that does not include digital technology — to "interactive holographic theater" — total immersion and interaction in a virtual world[14] (2007).

[13] http://www.digitalcultures.org/Symp/Yacov.htm. Accessed 29-06-2024.

[14] www.musofyr.com/taxonomy/taxonomy.pdf Accessed 01/06/2024.

Figure 6.

Involuntary, Improvised and Avatar Arms (2012). In a physical venue, the Herbert Gallery, Conventry, Stelarc is animated by his Second Life avatar, Stelarc Luic



Source: http://stelarc.org/video.php

Schrum subdivides the seventh category into "performance adapted to real life" and "performance in cyberspace" — the first characterized as "plays about real life performed in cyberspace" and the second as "plays created and situated in cyberspace performed in cyberspace."

I agree with Helen Varley Jamieson when she considers that the Internet is inherent to cyberformance and that it coincides with all the categories defined by Stephen A. Schrum except the last, holographic: "Instead of using the term cyberformance, I could be writing about 'digitally supported theater-performance, digitally assisted multimedia, digitally augmented, cyber-adapted, computer-mediated.» (2008, p. 31). For this performer, cyberformance encompasses all of the above. However, the creator of the term cyberformance does not agree with Schrum when he affirms that in computer-mediated theater, the activity is limited to 'pre-programmed responses' that 'cannot influence or be perceived by the performers'" (Jamieson, 2008, pp. 31).

Today's cyberformance in virtual worlds encompasses all this and more — it uses, for example, motion tracking or motion capture through interfaces like webcams or game console controllers, making it somewhat more immersive, approaching Schrum's eighth category, or better yet, going beyond it (since the term holography seems inadequate and anachronistic).

As noted above, interactivity is also a characteristic questioned by Schrum in 2007. He stated that in computer-mediated theater, interactivity was limited to pre-programmed responses that did not influence the performers or that the performers did not even perceive. In contrast, in a performance in Second Life, the audience mingles with the performers, sometimes altering the course of the performance, just as they did in the days of hypertextual cyberformance or in 2D graphic platforms, as in *Dress the Nation* (2003)[15] by Avatar Body Collision, where an audience member erased part of the scenery.

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[15] https://www.creative-catalyst.com/abc/lysis/lysis.html. Accessed 20-06-2024.

Schrum's taxonomy, Causey's variables, and Birringer's models can be useful for an epistemology of digital performance but attempt — especially the first — to impose a framework on something that, by its very nature, contradicts classification. The digital environment is fluid and unfinished, and recent experiences in cyberformance show that an effort at categorization may be limited and limiting, and is likely to become quickly obsolete.

Both Axel Bruns (2008) and Piérre Lévy (1997), two theorist of cyberculture, allege that emerging ways of thinking require new epistemologies and that rigid taxonomies are inappropriate.

Bruns affirms there is a collapse of taxonomic knowledge structures: "(...) the traditional expert-based paradigm of classification according to fixed schemata is unable to cope with the range of information now available in the global knowledge space, for both practical and conceptual reasons" (2008, p. 192).

Lévy, on the other hand, suggests that we should build above the traditional knowledge space "a new, unbroken space, free of barriers, continuous, receptive to the multitude of moving figures that trace our collective becoming" (1997, p. 183).

With this notion in mind, we cannot help but admit that the object of this investigation, cyberformance, can be divided into various "variants" yes, but they intersect and they are fluid, mobile, and rapidly obsolete. As Jamieson noted: "If cyberformance were incorporated into Schrum's taxonomy of digital performance, perhaps it would be a layer over the top of all categories, experimentally pushing outward, to the limits of imagination, bridging the shifting sands between the 'theater/performance' islands and other artistic disciplines (2008, p. 40).

3. Conclusion

Based on the above discussion, it is understood that neither digital performance in general nor cyberformance in particular can be easily categorized or reduced to the taxonomies of virtual reality. These concepts are valuable for understanding the experience of remote communication, but they can also be limiting.

However, it is true that both cyberformance experiences and the taxonomic models applied to them, straddling augmented reality and virtual reality, can be useful for analyzing our daily communication and the increasingly popular use of VR gadgets.

After reviewing these seminal studies on mixed reality, we must ask ourselves where we stand today regarding VR experiences: does mixed reality present a pathway to better everyday communication and greater participation in online performing arts, or is it merely an impediment, distancing us from our senses, blinding us, and causing us to stumble in a pseudo-immersive world that dulls our senses and alienates us from our bodies?

At a time when issues such as the effects of digital devices on children's and young people's health are being debated, and AI has become a fixture in schools and everyday life, we need to reassess the possibilities of technology. It is crucial for everyone to understand that the freedom to use the Internet and the preservation of our physical and mental health should be priorities in this relentless pursuit of the virtual.

In conclusion, the discourse surrounding cyberformance transcends mere classification; it embodies a dynamic fusion of artistry, technology, and human expression. Through our exploration, we have unearthed the multifaceted nature of cyberformance, revealing its

capacity to challenge traditional cathegories of performance and redefine the boundaries of artistic expression. From its humble beginnings in early cyberspaces to its current prominence in virtual worlds and graphic environments, cyberformance has evolved into a rich tapestry of creative experimentation and collaborative engagement. While taxonomies and definitions provide valuable frameworks for understanding cyberformance, they often fall short of capturing its fluid and evolving nature. As scholars and practitioners continue to grapple with the complexities of cyberformance, it becomes increasingly evident that its significance extends far beyond the confines of conventional categorization. As we navigate the ever-expanding landscape of digital art, cyberformance stands as a testament to the boundless possibilities of human creativity in an increasingly interconnected world.

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