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An Approach to Teaching Digital Interactive Performance

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Abstract: By its complexity, performance art remains one of the most expressive art forms, although difficult to define, as some would argue. The use of media technologies in performance brought a significant enrichment to the artistic expression ever since the first experiments with video art, and broke the barriers between visual arts, cinema, and performing arts. New media and the revolution in communication brought by the Internet increased the complexity of the artistic productions that incorporate digital interactive technologies, making it very difficult to assess the artistic artefacts that tend to fall between art and science. The paper is presenting an approach to teaching digital interactive performance theory and practice, by providing a framework necessary for the development of definitions and taxonomies as well as an understanding of the interdisciplinary aspect of the practice of this emerging artistic genre. The analysis of the narrative discourse that pertains to certain forms of digital performance and the discussion about the esthetic, philosophical or technological aspects is significantly improved by the identification of the main critical paradigms that subscribe them. The paradigms discussed – subscribed to performance studies, digital culture, performing arts and human computer interaction – were developed considering the Romanian context of academic performing arts studies, that focuses almost exclusively on theatre and lacks a tradition in performance studies. The synthesis research about the digital interactive performance opens the discussion about cultivating an educational context appropriate for training artists capable to develop artistic productions relevant in the context of the new arts. The current pedagogical approach needs to be replaced by a heutagogical one, where practical and collaborative projects can be tackled in an innovative, inter-disciplinary framework. Such an approach is not formally possible in the current academic settings, but can be hosted by the university in interdisciplinary research centers and other artistic production contexts.

Keywords: Interactive digital performance, performance studies, digital culture, performance art, human-computer interaction.

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Introduction

In European and international universities, the teaching of artistic disciplines has long been outside the traditional boundaries between the arts. Although we encounter new techniques of artistic expression presented in formal or informal contexts – exhibitions, events, performances or festivals – there is no academic framework in Romania for the formal, programmatic study of non-traditional art genres. Artistic education remains bound to art fields and classical disciplinary specializations, insignificantly changed from the beginning of the last century. This research proposes an integrative and interdisciplinary vision to facilitate a formal understanding and openness to the phenomenon of adopting and integrating new digital media technologies into artistic productions.

The main objective is to identify an interdisciplinary theoretical framework for the analysis of performative artistic productions incorporating digital technologies in order to equip the artists with the skills and competences needed in a multidisciplinary team able to perform intermedia productions. The theorization of intermedia / multimedia artistic expressions, on the one hand, and the development of an academic training program in art from an interdisciplinary perspective, on the other hand, create the premises for the development of new models of artistic education in Romania, aligned with the European and international standards.

Literature Review

The first author to publish a reference work that places performance arts in the history of arts Rosalee Goldberg[2]. Goldberg defines performance as being "live art, by artists", and is offering a historical look on performance as a form of art. Starting with "The Untamable" manifest event of the Futurists and the provocative cabaret of the Dadaist, she is addressing the notion of the ideea as a basic element best expressed through performance and the importance of conceptual art.

Marvin Carlson[3] continued the attempts to define and delimit performance as a concept and he set the basis for what performance studies

2. Roselee Goldberg, *Performance. Live Art from 1909 to the present*, (New York: Harry N. Abrams, Inc. Publishers, 1979).
3. Marvin Carlson, *Performance: a critical introduction* (London: Routledge, 1996).

would become as an academic discipline that analyzes performing arts from the perspective of sociological, psychological, cultural studies or social issues identified in the analysis of artistic discourse. Looking for an answer to the question "What is Performance?" Carlson turns to social science issues first, following a number of anthropological and ethnographic hypostases in culture. He also addresses sociological and psychological perspectives, while his linguistic approaches speak about the performativity of the language. "Performance by its nature resists conclusions, just as it resists the sort of definitions, boundaries and limits so useful to traditional academic writing and academic structures."[4] Carlson looks at performance in terms of contemporary theories, such as postmodernism, the issue of identity, or the perspective of cultural and gender studies. Richard Schechner[5] contributes to the development of performance studies bringing the practitioner's perspective. His approach is the foundation of the field of performance studies, analyzing the artistic expression from an interdisciplinary perspective with approaches specific to anthropology, philosophy, psychology or sociology, but also offering new instruments, specific to theatricality. "[...] the process of seeking a possible definition [is] more relevant than trying to impose an (unlikely) absolute result," comments Saviana Stănescu in introducing the volume[6].

Carlson and Schechner represent the category of theoreticians who, by focusing on theatre, theatricality and performance, have laid the foundation for performance studies as open disciplines for specific approaches in philosophy, anthropology, linguistics, cultural studies, etc.

Andre Helbo[7], Henry Bial[8], Johannes Birringer[9] and Susan Broadhurst[10] complete the list of theoreticians and practitioners who have consistently contributed to the development of a specialized literature that became a discipline of study in Anglo-Saxon space. Although none of these authors neglect the influence of digital technologies on performing arts, Steve Dixon[11],

4. Ibid., 189.
5. Richard Schechner, *Performance - Introducere și Teorie*, (București: Unitext, 2009).
6. Ibid., 10.
7. Andre Helbo, *Theory of Performing Arts*, (Amsterdam: John Benjamins Publishing Company, 1987).
8. Henri Bial, *The Performance Studies Reader*, (London: Routledge, 2004).
9. Johannes Birringer, *Media and Performance - Along the Border*, (Bltimore: The John Hopkins University Press, 1998).
10. Susan Broadhurst and Josephine Machon, *Identity, Performance and Technology: Practices of Empowerment, Embodiment and Technicity*, (Basingstoke: Palgrave Macmillan, 2012).
11. Steve Dixon, *Digital Performance. A History of New Media in Theater, Dance, Performance Art, and Installation*, (Cambrdige, Massachusetts: MIT Press 2007).

Chapple & Kattenbelt[12], Bay Cheng & all[13], Kwastek[14] and Koosel[15] paid special attention to the intermedial performance practice.

Dixon makes a review of the history of digital performance from emerging participative performance forms to the practice of contemporary interactive digital performance, challenging some classical theoretical approaches and instead suggesting the most complete presentation of digital performances identified so far. Referring to the artistic productions or artefacts that incorporate digital interactive technologies or media, Dixon consecrates the phrase "interactive digital performance", explaining each of these terms. Ben-Cheng & all and Chapple and Kattenbelt appeal to the concept of intermediality when deciphering performance incorporating digital interactive technologies.

Methodology

Performing art themes, in general, and interactive digital performance, in particular, are extremely generous and lend themselves to multiple approaches. The approaches range from historical, monographic or critical studies centered on the work of authors, to studies stemming from practice as research, as are many of the specialized literature reviewed. In this paper, we have pursued the approach of the synthesis research[16], designed to integrate empirical research in order to create generalizations. That allowed us to identify relevant theories and classifications and to make analyses of the topics covered by the literature in this field. The choice was primarily determined by the need to translate the conclusions into the Romanian academic space. Thus, taking into account the very broad context of artistic performance manifestations, the breadth of the field and the variety of disciplines involved in analyzing their content, we have sought to identify

12. Freda Chapple and Chiel Kattenbelt, *Intermediality in theatre and performance*, (Amsterdam: Rodopi. 2006).
13. Sarah Bay-Cheng et. al., *Mapping Intermediality in Performance*, (Amsterdam: Amsterdam University Press, 2010).
14. Katia Kwastek, *Aesthetics of Interaction in Digital Art*, (Cambridge, Massachusetts: The MIT Press, 2015).
15. Stacey Koosel, "Surfing the Digital Wave: Digital Identity as Extension," in *McLuhan's Philosophy of Media Centennial Conference* (Brussels: The Royal Flemish Academy of Belgium for Science and the Arts, 2012).
16. Harris Cooper and Larry Hedges, "Research Synthesis as A Scientific Process" in *The Handbook of Research Synthesis and Meta-Analysis*, edited by Harris Cooper and Larry Hedges (New York: Russel Sage Foundation, 2009), 6.

some critical paradigms that subscribe common areas of interest found in the themes addressed by theoreticians and reflected in the performance practice that is representative for some recognized artists.

Performance art and performance studies

When discussing performance, Powell and Shaffer[17] distinguish between what performance studies as a discipline **is** and what performance practice **does**. Traditionally, we refer to "performing arts" as being any kind of artistic performances such as concerts, theatre or music events, while "performance art" is more of an avant-garde genre derived from visual arts.

From this perspective, "performance" means bringing into being a fact, pronouncing a certain state, inducing the sense of becoming, affirmation. Carlson[18] discusses how areas such as psychology, anthropology, sociology or linguistics have influenced the concept of "performance": "By its nature, performance opposes the conclusions, just as it opposes those definitions, boundaries and limitations that are so useful to traditional academic studies and writings."[19]

In his attempt to define digital performance, Dixon states that this genre is opposed to Grotowski's approach of the "via negativa" – defined as the act of stripping the theatre of all the elements added reducing it to the essence, towards the empty space where the actor is the main element – being the very embrace of a "via positiva", an additive process in which "new technologies are added [in performance], a new ingredient that is delicious for some but tasteless for others."[20]

The complexity of the elements involved in building interactive digital performances requires complex interdisciplinary technical and conceptual approaches, so that the analysis of the artefacts and performance genres can be addressed from the perspective of disciplinary paradigms that subscribe common themes and theorizations.

In our study, we stopped at four such paradigms.

17. Benjamin Powell and Tracy Stephenson Shaffer, "The haunting of Performance Studies," *Liminalities: A Journal of Performance Studies* 5, no. 1 (2009).
18. Marvin Carlson, *Performance. A Critical Introduction* (2nd ed.), (New York: Routledge, 2004).
19. Ibid., 189.
20. Steve Dixon, *Digital Performance*, 28.

Performance studies paradigm

From the perspective of performance studies, performance is seen as a concept derived from theatricality, indicating the ability of speech to be more than communication, to be an agent capable of building an identity, consuming an action. In this sense, performance reverses the idea that gestures and actions are the result of individual identity and address identity as the result of a construct determined by behavior, gestures and actions.

Philosophy of technology

Together with Goldberg, Dixon, Carlson, Schechner or Helbo – who have laid the foundation for performance studies as open disciplines for specific approaches to philosophy, anthropology, linguistics or cultural studies – Andrew Feenberg emphasizes the importance of understanding the context of the philosophy of technology and the mechanisms that determine how the individual is relating to the technological developments.

Feenberg systematizes the answer to two basic questions in a matrix that includes the four categories of technology philosophies that represent the major theories about technology and its relation to the human being. The first question is: "Can people control the technology? Is it autonomous or subject to human control?" The second question addresses the nature of the technology: "Does the technology have value in itself or is it value-neutral? Is there a connection between means (technology) and purpose (values)?"[21]

First of all, *determinism* considers that technological development is autonomous and largely neutral, rather as a positive force that contributes to the development of society, but technology has no value in itself, and people have no control over its development. Technological development is autonomous and the society is determined and even controlled by technological change, which shapes it according to the needs of progress and efficiency.

For others, technology has no value in itself, but its development can be controlled. Today, most tend to support this position, known as *instrumentalism*. Even if technologies help us achieve our goals, we can and must control their development and use. According to this perspective, technology alone does not have the power to influence, but the way we use it, does. One of the favorite slogans of the instrumentalists is: "not weapons kill people, but people kill other people."

21. Andrew Feenberg, "What Is Philosophy of Technolgy," in *Defining Technological Literacy*, ed. John Dakers (New York: Palgrave Macmillan, 2014).

Theories that regard technology as being loaded with value are called *substantivism*. According to these theories, we do not choose technology just to make our life more efficient, but we choose a lifestyle. Once committed to technological development, society will be transformed according to its values, such as efficiency and power. Traditional values hardly survive the challenges of technology.

Critical theory, more nuanced and strongly advocated by Feenberg, believes, like instrumentalists, that people have the opportunity to control the development of technology and influence the consequences of using it by setting up appropriate institutions to exercise control over them.

All of these concerns about technologies and how they affect lifestyles in the information age are at the heart of the narrative discourse of artistic expressions in digital-embedded performances.

A very good illustration of the anxieties generated by the effects of digital technologies on human life in the information age and the dynamics of their control is *Le Sacre du Printemps*, an interdisciplinary artistic production by Klaus Obermeier, an intermedia artist.

Figure 1: Klaus Obermeier – Le Sacre du Printemps (2006)

The images described by the dancer performing live on a stage are captured and generated in real-time by stereoscopic cameras and by a sophisticated computerized system, so that a complex image is projected into three dimensions in a virtually immersive space accessed by stereoscopic glasses.

Thus, the human body becomes the interface between the real world and the virtual one. Through 32 microphones, the entire orchestra is integrated into this interactive process, because musical motifs, individual and instrumental voices influence the shape, movement and complexity of the dancer's projections. Music is no longer just a starting point, but a complement to choreography, in a very successful illustration of the anxieties produced by the digital world, which, spinning out of control, leads to self-destruction and dissolution in an infinite number of entities.

The extension of the human body

The theme of the extension of the human body or of its faculties through technology is an important philosophical starting point, but also a favorite theme in experimental artefacts that incorporate digital technology. The theory of extension – consecrated by McLuhan[22], but previously formulated in similar form by Kapp and Rothenberg[23] – predicted the impact that new media technologies would have on human life, including increased immersion into media and dependence on digital stimuli.

After a phase that leads to a self-amputation form, the overloading of sensory circuits due to stimuli coming from the new environments determines the gradual installation of a numbness process. “Almost 50 years after McLuhan explored the effects of our technologies on the psyche, research has yet to move forward significantly, and we are still poised to rediscover the same idea. This scenario would suggest a trend where technology may be infiltrating our lives and sense at a much greater pace then our ability to understand the effects and pressure they place on our sensorium and psyche.”[24]

Adopting generally a deterministic positivist perspective – understood as a separation of means from purpose[25] and representing a positive view of

22. Marshall McLuhan, *Understanding Media: The Extensions of Man* (New York: McGraw-Hill, 1964).
23. Philip Brey, “Theories of Technology as Extension of the Human Faculties,” *Metaphysics, Epistemology, and Technology. Research in Philosophy and Technology* 19 (2000).
24. Koosel, “Surfing the Digital Wave: Digital Identity as Extension,” 3.
25. Feenberg, “What Is Philosophy of Technolgy.”

the impact of technologies on humanity – posthumanism has a particular impact on art in the information society and forms the basic concept of some articulated performance instances.

Representative for post-humanist performing art, Stelarc is particularly influenced by McLuhan's theory of extension of the human body through technology and the developments in the field of artificial intelligence that have triggered these openings. Illustrative to detail, his first performances described more than two decades ago the effect of extension that technology may have, from expanding the mechanical functions of the human body to giving up control over it altogether and delegating it to the extended human community.

> Stelarc takes literally McLuhan's notion that technological media are extensions of the human senses, and all of his recent performances demonstrate a perverse insistence on body modifications and the redesign not of the space surrounding the body's kinesphere but of the body's architecture, skin, and internal body spaces themselves – 'the physiological hardware', as Stelarc calls it.[26]

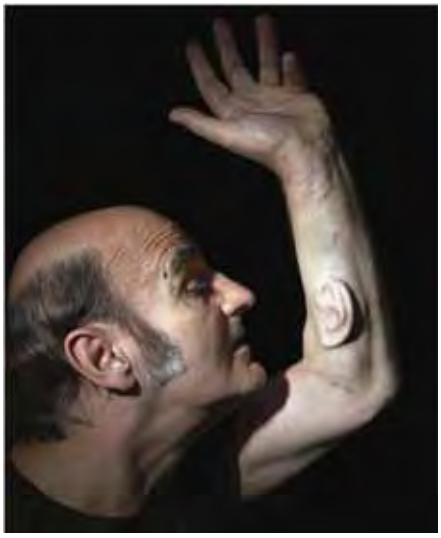

Figure 2: Stelarc – *Ear on Arm*, Media Gallery, Concorde University, 20

26. Johanis Birringer, *Media and Performance - Along the Border* (Baltimore: The John Hopkins University Press, 1998), 61.

From the *Amplified Body, Laser Eyes and Third Hand* (1975) to the ongoing *Ear on Arm* (2010) body-modification performance, Stelarc is using innovative performance practices to express his posthumanistic view regarding the human body as being obsolete, inadequate and imperfect within the context of a digital age.

By the complexity of his performative interventions - and here we are not only referring to the degree of sophistication of the used technologies and the chosen artistic solutions, but also to the depth and complexity of the ideas represented and the application of the performance as a social concept - Stelarc is defined as one of the most Representative artists of our times and the most important exponent of Transhumanist art.

The digital culture paradigm

The second paradigm addresses the performance from the perspective of digital culture, understood as the set of values, beliefs, artifacts, rituals and other general characteristics of a culture, which develops as a consequence of digital technological developments in the last decades and which form the context of the current information society.

Although launched in the 1960s and introduced as an academic discipline by Dick Higgins in 1968, the concept of *intermedia* was not included in the dictionaries and is much less known and used than *multimedia* - a concept that designates the use or integration of multiple media in an artefact.

Although only a limited number of specialists, most of them academics, are concerned about the property of these terms, Friedman[27], a practitioner who becomes a theoretician, tries to clarify the differences between the meanings of these concepts. In practice, the two are often confused or interchangeable. Intermedia is a term used mainly in the academic environment, and may be found in biology, chemistry and medicine publications. Multimedia appears in databases a hundred times more often than intermedia, and although there is a tendency to link the definition of new technologies lately, the term is much broader.

However, while using *intermedia* and *multimedia when* describing the complexity of the relationships between different types of media and how

27. Ken Friedman, "Intermedia, Multimedia, Media," *Artifact*, 2007, 4.

they are exploited in the context of different arts, most authors appeal to similar definitions and meanings[28].

Practitioners such as Johannes Birringer, Susan Kozel, and Lisa Naugel[29] (Mullins, 2013) suggest that the digital technology they interact with during digital performances can be perceived as a silent partner that influences them and determines the course of their actions. Digital technologies allow the building of fluid, dynamic spaces within which performers can evolve, while at the same time determining the construction of new spaces through bi-directional interfaces.

This perspective allows for a first classification of interactive digital performances.

Derived performance

In derived performances, the movements of the dancer are captured through an interface and then translated into digital information that is processed through the computer. The final images generated by algorithms are projected back to the surface of the performance space, all of these processes occurring instantaneously in real time. Klaus Obermeier – one of the first intermedia artists that experimented with responsive video projection ever since the early 2000s – reached a high level of artistry with his complex stereoscopic projection of *Le Sacre du Printemps*. Gideon Obarzanek and the Chunky Moves Company have consecrated this genre with *Glow*, an intermedia production presented at the Venice Biennale in 2011. Another example of derived performances are the productions of Adrein M / Claire B, a dance company that creates performances where the dancer is performing within a three-dimensional space created and continuously transformed by the movements of the dancer.

28. Sarah Bay-Cheng et al., eds., *Mapping Intermediality in Performance* (Amsterdam: Amsterdam University Press, 2010); J Sage Elwell, "Intermedia: Forty Years On And Beyond," *Afterimage* 33, no. 5 (2008); Friedman, "Intermedia, Multimedia, Media"; Hans Breder and Herman Rapaport, "Intermedia: A Consciousness-Based Process," *PAJ: A Journal of Performance and Art* 33, no. 3 (September 2011): 11–23, https://doi.org/10.1162/PAJJ_a_00051.

29. Eric Mullis, "Dance, Interactive Technology, and the Device Paradigm," *Dance Research Journal* 45, no. 3 (2013).

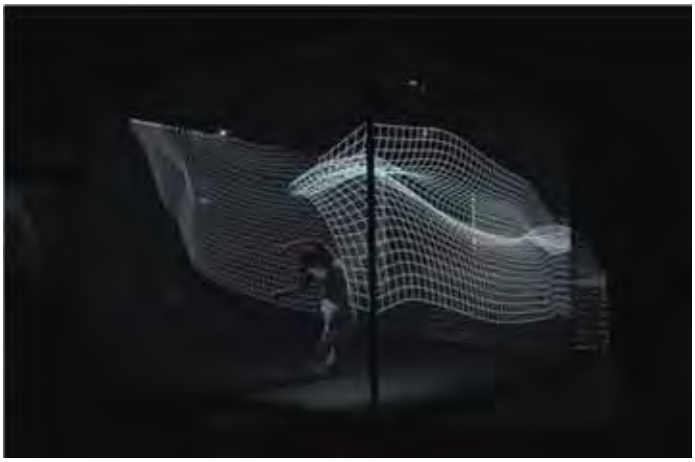

Figure 3: Adrien M / Claire B - *Hakanai*. (2013).

Immersive performance

When the performer is transposed through digital technologies and performs in a digitally built virtual reality space, we are dealing with an *immersive performance*. Stereoscopic glasses, body sensors, digital gauntlets - are interface elements that collect motion-related data that your computer uses to interfere with virtual space.

Figure 4: Gromla – Dancing with a Virtual Dervish (1993).

Bi-directionality also exists here, the performer sails and explores a "fluid" virtual reactive landscape. In this case, the audience cannot see the interaction in which the dancer / performer is engaged, but may later be invited to experience this kind of immersive interaction. Representative in this sense is Dancing with a Virtual Dervish, a virtual reality work created in 1992 by designer Diane Gromala and choreographer Yacov Sharir.

Telematic performance

Networked performance – also called telematic – is a form of performance that takes place on online, over the network, and involves the ability to create telepresence through video and sound systems that capture movements from remote locations and project them on a performing space.

In 1991, Troika Ranch produced the performance *An Adjacent Disclosure*. The dancers were performing live in completely different locations, though not so far apart from each other. The captured images were projected onto a screen in which the two dancers seemed to dance together, though they could not at all touch it.

Figure 5: Troika Ranch – *An Adjacent Disclosure* (1991)

Technological challenges are complex in telematic performances, varying from distortion of image and sound due to remote transmissions to echoes or distortions of the sound. While the technical aspects were improved as technologies advanced, and the use of broadband networks solved many of the issues of the early productions, the fascination of interaction between performers in different spaces and the effects of digital technology mediation remains. In such experiments, the process is more important than the final product.

Interactive digital performance – derived, immersive or telematic – involve the use of technologies that affect in real time both the environment in which it performs and the space shared by the public and the performer. The dancer experiences a movement articulation that is amplified by technology and affected by the environment that his movements create[30].

Performing arts paradigm

The analysis of digital performance from the perspective of the paradigm of performing arts inevitably touches some of the most important themes specific to the theories of theatricality. Three of these are of the utmost importance and are present in the analysis of the most important authors (Birringer, 1998; Dixon, 2007; Kwasek, 2013; Bay-Cheng & all, 2010; Broadhurst, 2012). These are: body - embodiment, space - spatiality and time - temporality.

Body – embodiment

The dualist-Cartesian vision of the body is strongly influenced by the antiquity writings of Socrates, Plato, and then by Rene Descartes, who – in his *Discourse on the Method* – consecrated the philosophy of separation of mind from body and the superiority of mind over body. “If we are ever to have pure knowledge of anything, we must get rid of the body and contemplate things by themselves with the soul by itself […]”, said Socrates[31].

This philosophy, which would dominate Western culture for many centuries, continues to influence modern thinking, although it is overcome by other holistic approaches to the body, such as that which includes, along

30. Mullis, 113.

31. Steve Dixon, *Digital Performance. A History of New Media in Theater, Dance, Performance Art, and Installation* (Cambridge: The MIT Press, 2007), 212.

with body, mind and self. This explains the extremes we are witnessing in relation to the human body in today's society, and obsession with the various aspects of corporeality that contemporary cultural theories have.

On the one hand, we are witnessing an obsession fueled by the engines of the Western marketing machine, linked to “body beautiful” - the perfect body. On the other hand, many forms of artistic expression, collectively reunited under the title of “body art”, creatively illustrate different views on the body, especially in the antithesis, those that oppose the widely accepted standards of beauty and ridicule them.

Body art

Some artists choose to use the body as a performing space, reducing it to object status and thus negating the aspects that define humanity[32]. Liviu Maliţa presents several categories of performances that represent extreme cases of body art. In his opinion, “Orlan decisively intervenes in the identity debate and in the one dedicated to the destiny of man in the societies of the future. The comparison of a body with an object is a way to cancel the sexual and social footprints, to neutralize it ideologically”[33]. In her performances, Orlan underwent a series of aesthetic operations aimed at acting against the established standards of beauty, which she considers “the expression of a dominant ideology”.

Beyond the finality – re-building the physiognomy through aesthetic remodeling of the anatomical components – the artist adds the performance aspects: during the works, sometimes broadcast live on the Internet, the artist lectures texts of philosophy, psychoanalysis, literature or Sanscripte writings from the authors consider yourself representative of the statement you make.

Another artist who transforms his own body into performing space is Stelarc. In 1993, Stelarc made an “exhibition” in the space circumscribed by the inside of his stomach, ingesting a mechanized object considered “sculpture”. The performance, which put his life in jeopardy, was shot and presented at the 1993 Melbourne Sculpture Triennial, the theme of which was site-specific works.

32. Francesca Ferrando, “Humans, Cyborgs, Posthumans: Francesca Ferrando at TEDxSiliconAlley” (TedX Talks, 2013), https: / / www.youtube.com / watch?v=RGjMUw03Bv0.
33. Liviu Maliţa, *Extremele Artei* (Cluj-Napoca: Editura Accent, 2010), 75.

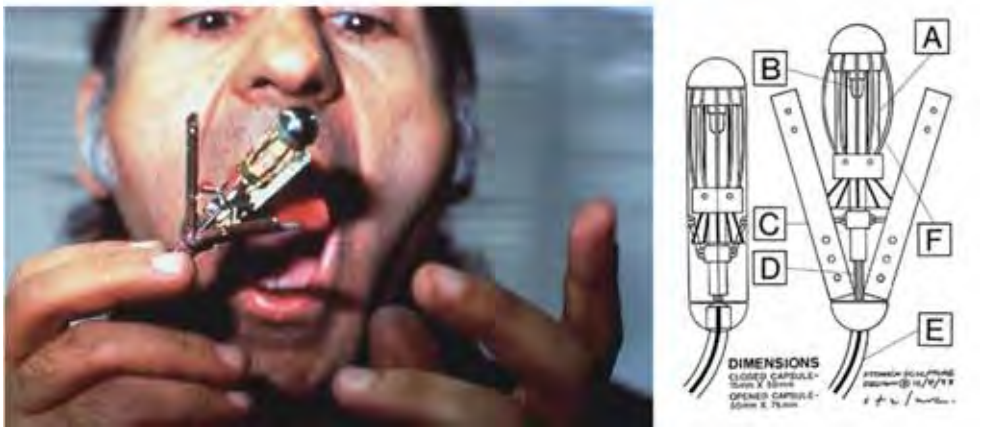

Figure 6: Stelarc – Stomach Sculpture (1993), Melbourne Australia

Digital Double

With the introduction of digital technologies in performance and the use of new types of media, the expressive potential of the notion of body / corporeality is multiplied even more so as the reality has more dimensions or, more precisely, becomes a virtual reality. The possibility of having the body in a space other than the physical one has strong metaphysical and artistic valences, because it actually illustrates real-world emotions experienced by the modern user that spends most of the time in virtual space.

In the virtual space there are several approaches to the notion of body. One of these is the "embodiment" - or "re-embodiment" - in the form of an avatar. The avatar is a computer graphics, more or less realistic, that performs in a virtual space created in an artificial, drawn world, where it lives and behaves like a human character. Very often, he has human traits, similar to those of the person he emulates. Obviously, the avatar can assume another genre, other features, another look, and other behavior. Through it, we have, at once, an infinite number of solutions. Moreover, it is possible to use several avatars on different platforms, in different games or virtual social contexts, while in the immediate reality the person carries out his / her own social role.

This detachment from our own body, which we find in games, and the transfer of consciousness and self to an avatar - on an unreal character that you can manipulate in virtual space - can even lead to suicide, because it depends on the ability of the mind and Self to detach and ignore bodyness.

In fact, all of these elements have a tremendous experimental potential in telematic digital performance, "redefining our senses and resensibilising our perception through bodily encounters with [digital] technologies"[34].

Such performance is also *Aki Anne II*, described by Koski[35], in which four performers perform in a play in Second Life, projecting their actions across multiple screens in front of an audience. Two of them manipulate live the avatar of the character Anne, one of them controlling the movements of the body, and the other representing her mind, with the emotions she is experiencing.

Figure 7: *Aki Anne II* (2007-2008)

In this way, the division of the control mechanisms between the two performers is reduced by identifying with the avatar: The first performer moves it using the carpet, and the second controls the other actions of the avatar, including the image of Second Life. The third performer simultaneously plays the roles of the storyteller and the avatar's mother, but without physical or virtual presence, while the fourth performer is Anne's everyday self, present on stage as a player interacting with Anne's avatar Second Life. While the

34. Bay-Cheng et al., *Mapping Intermediality in Performance*, 28.

35. Kaisu Koski, "Instances. Performing an Avatar: Second Life on Stage," in *Mapping Intermediality in Performance*, ed. Sarah Bay-Cheng et al. (Amsterdam: Amsteradam University Press, 2010).

scenes unfold as game levels in a relatively choreographed sequence, the rebuilding of events that took place in Second Life and the improvised encounters converge to the final stage – an orgy – in which Anne's avatar interacts with other Second Life avatars, engaging in sexual relations.

The performer manipulating Anne's avatar refuses to engage actively and leaves the [real] scene. At this point, a spectator is invited to animate the abandoned avatar, which, once revived, through the act of engaging in orgy, steps over the threshold of an initiation ritual in the virtual world, assuming its status as a virtual being fully owned by Second Life.

Presence and significance in time

One of the issues that arise when talking about time in the context of any type of performance is related to the concept of live or real live time. The concept was born with the advent of media technologies. Until then, an event simply takes place in real time. The possibility of transmitting a signal at a distance through electronic media (radio and then television) generated for the first time the need for a distinction between live, and mediated, or recorded.

When talking about livens, some emphasize the notion of temporality - when the show happens, while others emphasize the presence of the performer - where the performance takes place. In this regard, we can refer to the state experienced by a player in electronic games where there is no physical presence - we are talking about a virtual world - and yet the feeling of a live event is as alive as the system’s reaction in real time to the user's in-put.

The discussion of livens and the notion of presence or absence is perfectly relevant in the context of interactive digital performances, given that we are dealing with a variety of means of expression that take full advantage of the meanings of presence and of digital technologies that can simulate, recreate or facilitate new relationships, new forms of livens.

Dixon addresses the issue of presence extensively[36], discussing how the physical presence exercises its supremacy over the virtual, not the physical substance of the actual body on the stage, but insofar as it is engaged in a speech that has significance. Thus, a virtual character present through a video projection can prioritize the spectator's attention by successfully conquering the character physically present on the stage if he does not impose his presence in a meaningful way.

36. Dixon, *Digital Performance. A History of New Media in Theater, Dance, Performance Art, and Installation*, 131–33.

Once mediated and remediated by digital technologies, time and space become relative notions. A recorded moment can become, by staging, present. Technology makes the space extend beyond the space of performance, with the audience being hundreds of miles away - or in the adjoining room.

Performance art in liminal spaces

The discussion of presence and virtual reality opens the subject of space in interactive digital performance. The concern to explore new artistic paradigms in the generous contexts offered by new digital technologies and other fields of science has led to the development of new forms of artistic expression in performing arts. Talking about space, Doyle[37] identifies in the performing arts practice of the past two decades two main directions for exploring the relationship between corporality and space. The first has to do with the ability of the human body to perform in a physical space free of gravity (zero gravity), while the second explores the virtual space in which the artist performs in a space without gravity and where, although the body is not real, the sensations experienced by the performer can be perceived as real.

Non-gravitational performance

A series of creative laboratories have conducted experiments exploring the movement of the body in spaces where the effects of gravity have been altered in parabolic flights or in water basins. French artist Kiotsu Dubois is one of the first researchers to experience the impenetrable movement since the 1990s, using dance-specific techniques to train astronauts at the French National Center for Scientific Research. Here's how she describes her experience: “It was necessary to put oneself in a state of dance, this is to say to concentrate on internal bodily space and the relation this holds with the surrounding space as well as on the imaginary that emerges directly from this new body-space-time.”[38]

37. Denise Doyle, “Out of This World: Exploring Embodiment and Space through Artistic Processes and Practice,” *International Journal of Performance Arts and Digital Media* 11, no. 1 (January 2, 2015): 1–17, https://doi.org/10.1080/14794713.2014.998097.
38. Ibid.

Figure 8: Kiatsu Dubois – *Apesanteur* (1994)

Exploring the telematic space

In his 1997 Ghosts and Astronauts production, Susan Kozel performs a telematic performance by applying both concepts from the phenomenology of Merleau Ponty's perception of the body and the surrounding world as well as the results of Dubois's experiential experiments in zero gravity spaces. In this performance - through the reciprocal projection of an artist in Riverside Studios, the body of another performer, located in London's Place Theatre - creates the context for exploring concepts related to intimacy, altered materialism and impenetrability.

The alteration of the notion of space by constructing some forms of telematic mediated presence was the theme of the first telematic performance experiments. Dixon[39] designates Paul Sermon as the first artist to define telepresence. Telematic Dreaming was conducted in 1992 in an exhibition room where there was a bed on which a picture could be projected, captured from another room, 5000 kilometers away, where an artist performs in front of the room.

39. Dixon, *Digital Performance. A History of New Media in Theater, Dance, Performance Art, and Installation*, 220.

Figure 9: Paul Sermon – *Telematic Dreaming.* (1993)

Someone from the audience in the exhibition room could lie down in bed, alongside the projection of the artist's image, who could see what was going on in the exhibition hall. Thus, without physically touching the two, they could react and interact with one another, even though you are at a distance. In this experiment, through digital technologies, the artist could be present in a remote space.

Spectatorship

Another important theme within the paradigm of performing arts is audience and spectatorship. In the context of digital performances, the spectator is often no longer passive, but becomes an active user. Abercrombie & Longhurst[40] addresses audience analysis from a sociological perspective, arguing that "[…] a new way of understanding the development of audience research and, more importantly, for conceptualizing the current accumulation of evidence on audience processes."

40. Nicholas Abercrombie and Brian J Longhurst, *Audiences: A Sociological Theory of Performance and Imagination* (Thousand Oaks: SAGE Publications, 1998).

Runcan[41] lists some of the mutations suffered by the public characterized as the "digital generation": a dramatic decrease in interest and spectatorial practices, due to a shortened attention span and a diminishing appetite for the traditional narrative; decreased interest in reading, coupled with increased interest for developing skills and finding information in the virtual world; alteration and compression of the vocabulary and the development of a slang specific for the digital worlds, including words, phrases and syntaxes borrowed from English; the abandonment of traditional values related to autocracy or copyright due to the evolution of new media and digital technologies, often more rapid than the adoption of rules or legislation to regulate them.

This audience is no longer docile, patient or lenient, but wants to be surprised, seeks novelty and is open to innovation. Interactive digital performance is the kind of show that meets these expectations, nourishing the appetite for new forms of media, to overcome the over-stimulation caused by a technological extension through a new one.

The paradigm of human-machine interaction

The fourth paradigm identified in the intermediate performance study describes the concern for performance theories and what is called the "the aesthetics of interactivity", identified in the field of human computer interaction (HCI). In the design of human / machine / technology interaction and in the research that addresses this field, performing arts and theories of theatricality are being considered as playing an increasingly important role, even though they do not address all aspects involved in the design of digital technologies[42].

Beyond the functionalist approaches that have dominated the early development of digital technologies and the design of interactions between individuals and technology, the cultural approach has highlighted the role of aesthetics in developing the strategies and principles that govern the design of interfaces and user assimilation of cultural, and their appropriation as identity objects.

41. Miruna Runcan, "Teorii Ale Receptarii Spectacolului - Suport de Curs," 2011, 95.
42. Lars Erik Udsen and Anker Helms Jørgensen, "The Aesthetic Turn: Unravelling Recent Aesthetic Approaches to Human-Computer Interaction," *Digital Creativity* 16, no. 4 (January 2005): 205–16, https://doi.org/10.1080/14626260500476564.

In other words, if a first wave of attention was focused on the functionality of technology, a second wave was directed to the professional, productive context in which technology was to be used, while the third wave approached the non-productive and non-rational, which dominate the directions of development of the recent period[43].

Within the context of the second and especially the third wave of human-machine interaction approaches, some researchers focus on the theories of performing arts and performance practices that can contribute to the development of superior digital products and performance experiences.

Digital live art

Sheridan defines *digital live art* as the "intersection between live art, computing and human-computer interaction"[44]. She argues that methods and theories used in performing arts can be used to evaluate and measure the man-machine interaction.

Sheridan's live digital art example is *The Talking Quilt*, a collaborative work by Sarah Heitlinger in London, which, within an intergenerational project, has sought to explore the links between community concepts and food / feeding. The project involved the development of a workshop in which a quilt was made (a textile work made of small pieces assembled together in a unitary project) by the contribution of several people in the community, in a sort of seating. During the workshop, the participants were recorded as they talked about the specific habits of their culture, especially around the preparation of food. "The quilt represents a framework stop to the notion of a farm at a given point in time, and involves different communities, including people from hard-to-reach places, such as a Somali community, but also young people or the elderly"[45].

43. Jocelyn Spence, Stuart Andrews, and David M Frohlich, "Now, Where Was I? Negotiating Time in Digitally Augmented Autobiographical Performance," *Journal of Media Practice* 13, no. 3 (2012): 269–84, https://doi.org/10.1386/jmpr.13.3.269_1.

44. Sara Heitlinger and Nick Bryan-Kinns, "Understanding Performative Behaviour within Content-Rich Digital Live Art," *Digital Creativity* 24, no. 2 (June 2013): 112, https://doi.org/10.1080/14626268.2013.808962.

45. Ibid., 113.

Figure 10: Sara Heitlinger – The Talking Quilt (2011).

In the final work, through the technology embedded in the material, several areas were created that could be activated by a technology embedded in a glove so that a visitor could turn into a participant and activate the recordings.

Alongside the exposed work of art, the context has been created to access a performance experience that includes narrative recorded and rendered based on interaction rules with the object. The reception of such a work goes beyond the frame prescribed by the reception of an artwork exposed in a particular space, because the work itself is far more than the actual object.

Experiential performance

Benford and Giannachi[46] believe that *Rider Spoke*, a work by Blast Theory company, sets the foundation for a "dramaturgy of performance" to express the different ways in which digital technology can be integrated into the performance experience. In this performance, which takes place on the stage of the whole city, the audience is an active participant, being both spectators and those who make the text.

46. Steve Benford and Gabriella Giannachi, *Performing Mixed Reality* (Cambridge: MIT Press, 2011), 23.

Participants can use their own bicycle or borrow one from the project site together with a mobile device mounted on it. Then they get a question and are invited to a secret location where they can record the answer using a map on the mobile device that also works as a geo-location device. In addition, at that location, they will also have the opportunity to discover through the geo-location system the places where other participants have recorded and submitted their answers.

Once in the physical proximity of the place where the responses of other participants were recorded and submitted, the participants can access their content, but only with the equipment received. The participants are both the public and the creators of the content of this project, which is currently available on the web page, so that although it is built according to the classic mixed reality performance model, the performance experience can also be seen in the form of a digital artefact.

Figure 11: Blast Theory – Rider Spoke (2007)

In 2011, Blast Theory expanded the original project by launching Riders Have Spoken, a project that contains an archive of several tens of thousands of recordings made so far during project tours around the world. By accessing the points marked on a series of maps of the cities in which the project was run, the audience can witness the recorded stories, this time through the computer, no matter the location. In this case, we are no longer dealing with an experimental performance, but with a multimedia viewing experience specific to the digital media.

These types of performances provide the context for the development of research directions in man-machine interaction that are claimed in the field of performing arts. The analysis of the roles assumed by the user in the performance experiments, as well as their alternation, benefit from the theories specific to public performances in the performing arts as well as in the design of digital games. The value of some "game" approaches is supported by theoreticians in the field of performance studies and established performers such as Schechner or Rosalee Goldberg. Also, in the context of studies related to the aesthetics of man-machine interaction, it is appreciated that theories pertaining to corporeality, temporality or presence, specific to performing arts, can not be ignored.

In conclusion, we believe that – within the context of the development of digital technologies and their omnipresence through mobile technologies in all areas of social life, including art – performance arts and performance theories are of interest not only to the artistic cultural context or to certain subjects in the sciences but also for certain areas of technical sciences.

In particular, the field of human-machine interaction is at a stage of development in which it turns to arts-specific theories and performance studies in an attempt to understand the behavior of the individual in interacting with digital systems and how artefacts that incorporate digital technologies are adopted, used and assimilated. In the same way, performing arts can no longer be studied without taking into account aspects of the integration of digital technologies, the nature of interactions between man and technology, and how cultural artefacts made in the context of new media are integrated and assimilated into the information society.

Discussion

We have covered four different critical paradigms that map the approach of the digital interactive performance study, each of which covers one or more domains that form part of the multi- and inter-disciplinary character of intermedial performance.

At one point or another, each of the areas covered by the paradigms discussed addresses some aspects of the influence of the digital technology on social life and on the individual, especially in the context in which the ubiquity of digital technologies permeates all areas of life and influences the way we live, we socialize, we learn or we create cultural and artistic values.

From this perspective, we can consider that the way in which digital interactive performance can be taught in a formal educational context, could be approached from the pedagogical perspective of any of these paradigms.

It is difficult to discuss about digital culture without addressing the field of digital arts, be it live performance, or other curatorial models specific for the digital content distributed on different media platforms. The philosophy of technology touches aspects that influence the post-humanist art, and the theories specific to the sociology and anthropology specific to the digital age have a decisive influence on contemporary performance practice. Rapid developments in the field of artificial intelligence introduce new variables into the equation that describes the information society. The regarding the way in which human-machine interaction is built into interface design is increasingly focused on models and experiences that come from theatricality and performing arts.

It would be simple to say that any of the pedagogical models of the mentioned domains can provide the framework for teaching the respective aspects involved in interactive digital performance. But this is one of the areas in which the sum of the parts does not equal with the whole. New solutions should be applied, through a paradigm shift in the educational approach.

In the context of the current crisis facing educational systems around the world, a crisis driven by technological developments and unprecedented access to information, there is a consensus that classical pedagogical methods need to be revised and adapted to new demands in society.

From the point of view of theories and methods, pedagogy focuses on child's formation trough leadership, and andragogy, on adult development. None of these approaches sufficiently explain the fact that the learning environment is permanently affected by the development of new technologies.

Hase and Kenyon[47] extended the concept of andragogy, introducing the term “heutagogy”, within the context of distance learning. The word comes from the Greek ευρετικός (heurista) - “to discover”, εφευρετικός (heuretikos) - „inventive”, εύρημα (heuriskein) - „to find” and άγω (ago) - „to lead”. Heutagogy designates learning strategies that target mature subjects. Through mentoring processes, existing knowledge can be developed and modified, leading to the creation of new horizons of knowledge. Heutagogy diverts attention from learning as a stage-based process to the ultimate goal of learning, the final product or stage.

47. Stewart Hase and Chris Kenyon, Self-Determined Learning: Heutagogy in Action (London: Bloomsbury Publishing, 2013).

To the extent that we want to train practitioners able to achieve relevant artistic productions in the context of the new digital arts, an innovative, interdisciplinary framework needs to be developed, in which the pedagogical approach should be replaced by a heutagogical one that would enable a practical, collaborative approach.

In the Anglo-Saxon area, since the 1980s, disciplines have been developed in the performance studies that cover the need to analyze narrative discourse from complex perspectives, so today there is a very consistent academic literature. Theoretical constructions have started from the performing practice, and practitioners have come to theorize and discuss in detail both their artistic approaches and the contexts in which they have taken place.

Until recently, in Romania, there was no such concern, the performing arts being concentrated exclusively on theatre studies. Although in recent years this problem has been approached at academic level in various university centers, the approaches are just beginning and there is a lack of tradition in the theoretical discourse formalized at the academic level.

The heutagogical approach is centered on providing learning experiences relevant to the aspirations of the mature learner, motivated and oriented towards a clear goal. Thus, by creating a context that attracts learners from the most diverse contexts, it is possible to build interdisciplinary teams in which the competences of the instructors – experienced practitioners – are complemented by the competencies of the learners, acquired in previous formal or informal contexts. With the most diverse media and technologies available, such a team can have a valuable creative and educational experience, without the formal academic constraints.

The context we have described can be an intensive workshop where learners make direct contact with various digital technologies and where they can build artefacts which illustrate various digital performance categories. The key to success is attracting motivated learners who come with experience or interest in different artistic and technical fields - visual arts, performing arts, music, literature, architecture, but also computer science, communication, cinema, media – and who are opened to new solutions.

Conclusions

The discussed paradigms incorporate many more themes than those mentioned, but circumscribe the appropriate framework necessary for the opening of research directions and for providing methodological solutions to

the analysis of interactive digital performances. We consider that the grouping of themes within these general paradigms facilitates both the analysis of the narrative discourse around certain forms of performance and the discussion of the aesthetic, philosophical or technological perspectives of the content.

At the intersection of arts and technology, in the context of the information society and the continuous development of digital media, digital interactive performance is an area that can no longer be ignored and academics are challenged to discover new interdisciplinary methodological approaches that address the complexity of this genre.

It is our hope that this study will contribute to such developments.

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