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Digital Technology and The New Arts From The Philosophy of Technology Perspective

Abstract. Nowadays, notions such as body, time, space, identity, reality, are all redefined in new thinking frames, determined by the impact of new technologies and new media on life. All of these concerns about the relationship with technologies and how they affect lifestyles in the information age are at the heart of narrative discourse or artistic expressions in digital-embedded performances. We will adopt the reference framework, developed by Feenberg, for an overview of the different theories of philosophy of technology and the laws governing technological development, including the critical theory perspective, all of which enable the decoding of new artistic expressions pertaining to the digital age.

Keywords: philosophy of technology, digital interactive performance, new technologies, information age, and digital arts.

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The world we live in today is significantly different from the one we lived in our childhood. Generally, in science, events that mark significant changes are measured in years, or even months, as opposed to historical events that took place in society, where change is slower. By using creative techniques to incorporate the latest digital technologies into performance, the artist often expresses what has not yet been formulated, anticipating the directions in which society will advance and creatively express possible consequences.

Shelly Palmer (2015) makes a strong assertion about the pace of technology development in our era: "Here's how to think about the remarkable pace of technological change and the huge number of people in simple terms: 1) Technology is changing at a faster and

faster pace. In fact, today is the slowest rate of technological change you will ever experience in your life. 2) The more people are connected, the more powerful the network becomes."

He bases his conclusions on Moore's law, the Accelerated Returns law, and Metcalf's law. For everyone's sake, Moore's law affirms that computer processing power doubles every two years (though some have shown that this estimate is not exactly accurate). Based on the analysis of the history of technological developments that have taken place so far in the Accelerated Returns Law, Raymond Kurtzweil (Asprem 5) argues that technological change is not linear but exponential. If his estimates are correct, the next hundred years of technological development will be equivalent to the last twenty thousand years, sometimes with exponential growth rates within exponential development. Metcalf's law[1] states that the value of a telecommunications network is proportional to the square of the number of users connected to the system, which again leads to ever-increasing values.

Even if not all the figures advanced in these laws are mathematically accurate (and there are some who argue they are not), the overall conclusion is daunting: we live in times of unprecedented changes. This simple fact has such a direct and significant impact on our lives, which we can reasonably expect to be able to witness the "singularity".

> ... The Singularity is technological change so rapid and so profound that it represents a rupture in the fabric of human history. Some would say that we cannot comprehend the Singularity, at least with our current level of understanding, and that it is impossible, therefore, to look past its 'event horizon' and make sense of what lies beyond. (Kurtzweil 3)

In order to understand what this really means, or if the concept of Singularity – as seen by Kurtzweil – even makes any sense, we turned to the philosophy of technology.

Andrew Feenberg, contemporary philosopher specialized in analyzing technological developments, provides the reference framework for a critical theory of technology that combines the social critique of technology derived from the philosophy of technology of Marx, Marcuse or Heidegger with insights from science and technology studies. Feenberg's primary contribution to the philosophy of technology is his argument for the democratic transformation of technology. "What human beings are and will become is decided in the shape of our tools no less than in the action of statesmen and political movements. The design of technology is thus an ontological decision fraught with political consequences. The exclusion of the vast majority from participation in this decision is profoundly undemocratic" (Feenberg 3).

His theories, developed in three important works – *The Critical Theory of Technology* (1991) (re-published as *Transforming Technology: A Critical Theory Revisited* [2002]), *Alternative Modernity: The Technical Turn in Philosophy and Social Theory* (1995), and *Questioning Technology* (1999) – are summarized in a small study meant to simplify

the understanding of his stance. He starts from two questions that help us define the nature of technology and the relationship between it and human beings.

The first question addresses the relationship between humans and technology: "Can people control technology? Is it autonomous or subject to human control?" The second question addresses the nature of the technology: "Does technology have value in itself or is it value-neutral? Is there a link between means (technology) and purpose (values)?" (Feenberg 2).

Feenberg systematizes the answer to these questions in a matrix (see table 1) that includes the four categories of philosophies of technology that help us to understand the relationship between the values attributed to technology and the human being's ability to control them. The four categories represent the major theories about technology and its relation to the human being.

Table 1. The four philosophies of technology according to Feenberg

Technology is:	**Autonomous**	**Humanly Controlled**
Neutral (complete separation of means and ends)	**Determinism** (e.g. modernization theory)	**Instrumentalism** (liberal faith in progress)
Value-laden (means form a way of life that includes ends)	**Substantivism** (means and ends linked in systems)	**Critical Theory** (choice of alternative means-ends systems)

Source: Feenberg, Andrew. "What Is Philosophy of Technology?" n.p., 2003. Web. 2 May 2018.

First of all, determinists believe that technology has no value in itself, and people have no control over its development. 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 [moral] value in itself, and people have no control over its development. In their view, technological development is autonomous from human control and the development of the society is determined – and one might even say, controlled – by technological change that shapes it according to the need for progress and efficiency.

For others, while technology has no value in itself, its development can be controlled. There are many who support this position, also known as instrumentalism, and think that – 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 intrumentalists is: "not weapons kill people, but people kill other people."

Theories that affirm that technology has moral value and that there is little or no control over the way it is being developed and used, are called substantivism. Under this view, we do not choose technology just to make our lives more efficient, but – with the choice – we choose a lifestyle. Once committed to technological development,

society is being transformed according to its values, such as efficiency and power. Traditional values hardly survive the challenges of technology.

Both those who support substantivism and those who are on the side of determinism have a common view, namely that technological development is not subject to human control. The notable difference between them is that determinists regard autonomous development as being determined by positive forces that contribute to the development of society, while substantiators foresee apocalyptic endpoints following indiscriminate adoption of technologies, as they have the power to subjugate themselves to their destructive values. In 1962, Thomas Kuhn affirmed that "During and after a technological change there is a change in worldview, a paradigm shift, much like any other scientific revolution." (Koosel 5).

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

> According to critical theory the values embodied in technology are socially specific and are not adequately represented by such abstractions as efficiency or control. Technology frames not just one way of life but many different possible ways of life, each of which reflects different choices of design and different extensions of technological mediation. (Feenberg 3).

In this case, the difference to substantivism is determined by the character of the values. Substantivism refers to values as intrinsic to technology, while critical theory expands the notion including social values that go through efficiency and control. In Feenberg's critical theory, technologies are seen as frameworks for lifestyles, not just as tools.

> ... the substantivist critique of instrumentalism does help us to understand that technologies are not neutral tools. Means and ends are connected. Thus even if some sort of human control of technology is possible, it is not instrumental control. In critical theory technologies are not seen as tools but as frameworks for ways of life. The choices open to us are situated a higher level than the instrumental level. [...] We do not have to wait for a god to save us as Heidegger expostulated but can hope to save ourselves through democratic interventions into technology. (4).

Basing this view on technology on a combination of constructivism with socially critical views of technology such as are found in theorists like Marcuse and Foucault, "Feenberg links social theory and philosophy to overcome one-sided approaches which either essentialize technology or reduce it to social facts." (Kellner 2).

Certainly, the development of digital technologies is a challenge to how people relate to each other and the physical world. Notions such as body, time, space, identity, reality, all are redefined in new thinking frames, determined by the impact

of new technologies and new media on life. Ultimately, some dispute even the notion or nature of humanity, while others believe that its very existence is in the game. Some consider that technological developments are impossible to predict, control or regularize, and technology has no value in itself. Others consider that technological developments are accompanied by dramatic changes, at all levels, including a new perspective on life, so the need to impose control over how these developments take place and influence our world is inevitable.

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

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

While the orchestra plays Stravinski's Le Sacre du Printemps, a female dancer performs on a small platform set on the right side of the stage (see fig. 1). The images described by the movements of the dancer performing live are captured and generated in real-time by stereoscopic cameras and a sophisticated computerized system, so that dancing is projected into three dimensions in an immersive virtual space accessed by stereoscopic glasses.

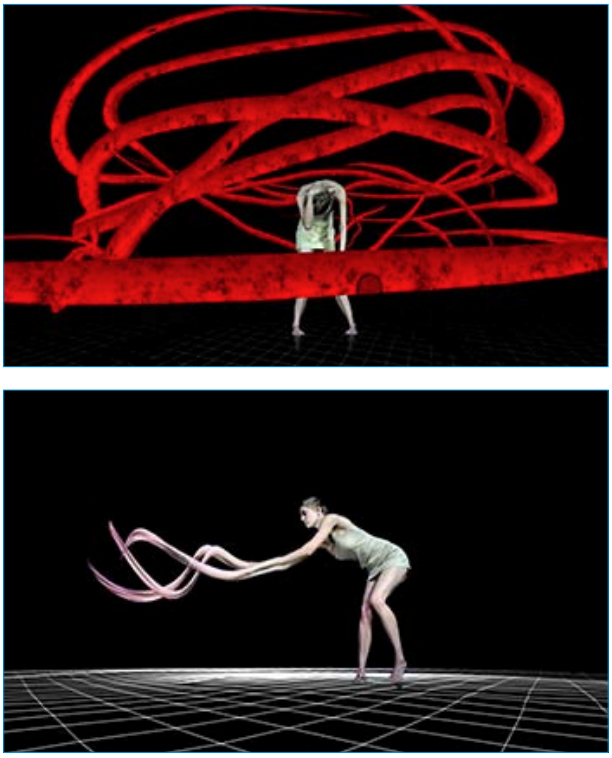

Fig. 1. Klaus Obermaier; Le Sacre du Printemps; (2006).

Source: photo capture, 1 May 20018; www.exile.at/sacre/photos_download.html.

The human body of the dancer becomes the interface between the real world and the virtual world. 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 poignant illustration of the anxieties produced by

the digital world, which, out of control, leads to self-destruction and dissolution in an infinite number of entities.

Technology as an extension of the human body

Marshal McLuhan (1964) predicted the impact that new media technologies would have on human life when he developed his theory of technology as being an extension of the human body. Although best known for this approach, McLuhan was not the first to compare the development of technology with the extension of parts of the human body. In a critical analysis of the theories of technology as a body extension developed by Kapp, McLuhan and Rothenberg, Brey (2000) issues his own version of this vision of technology development in the modern age.

Nearly a century before McLuhan, Ernst Kapp formulates a theory that describes every technological artifact as a projection of a human organ or an imitation of it. Although he does not use the term "extension," but rather "projection," he sees technology as a continuation of the human body. Kapp also believes that in the subconscious, human beings use their faculties as a standard in the design of technological artifacts.

Marshal McLuhan regards technology as an extension and an enhancement of body and cognitive functions. In his opinion, the main *body extensions* were developed in the mechanical age, along with the development of tools and machines to replace parts of the body that had physical functions, increasing strength, speed and productivity. Weapons were hand extensions, clothes represented skin extensions, the wheel were seen as leg extension, and so on. In his theory, Kapp refers to the physical form of the organ that is transferred or imitated by technology, while McLuhan speaks of a transfer and an amplification of body functions.

Media was perceived as an *extension of the senses*: the radio was an extension of the ears; the television, an extension of the eyes and the ear; the printed word also performed visual functions. The electrical media and the development of new media technologies are compared with the *extension of* information processing functions in *the nervous system*. In his view, the ultimate stage of the extension of human body functions will aim at achieving a *collective consciousness* at the level of the entire human society.

David Rothenberg – another technology philosopher who adopted the extension paradigm – describes technology as an extension of humanity, stating that technology can expand all those faculties we can understand from a mechanical perspective, such as organs or human parts. However, the extension can not affect elements that can not be mechanically understood, such as discernment, morality, orientation. His theory aims rather to the extension of human intentions than to the human body.

Brey continues his critique of Kapp, McLuhan and Rothenberg – percieved as being rather deterministic in their approach – and formulates his own view: technology as an extension of human faculties.

> Most extension theorists, including McLuhan and Kapp, show insufficient awareness of the social and cultural dimensions of artifacts. Thus, when McLuhan analyzes artifacts as mere means to more power, he appears to stress practical functions of artifacts and to overlook their cultural roles. Rothenberg displays more sensitivity to the social and cultural role of technology, but still classifies technological artifacts in a functional scheme that only recognizes their role as instruments for knowledge and physical action. Yet, it has to be observed that artifacts have both (practical) physical functions and (social-cultural) status functions, both of which serve to extend abilities of the human organism. (Brey 11)

While other theorists relate to the physical functions of technology, Brey looks at the status of the technological artifact, which can exert its function due to a collective acceptance of it.

Returning to McLuhan and his deterministic vision of technology, we can better understand the consequences – and perhaps even the cause – of the accelerated pace of technological development, as he describes them in „Understanding Media" when he talks about the consequences of information overloading the human body. Overwhelmed by the stimuli that come from the new environments, human beings go through a process of numbness. As a result, the body will have to short-circuit (or amputate) the stimuli. However, the self-amputation is followed by the need for a new extensions. Once we have created an extension in a new environment (or media), overloading with stimuli again leads to numbness and a new cycle begins. In a commentary on McLuhan's extension theory, Koosel concludes:

> 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. (Koosel 3)

Post-humanism and the utopia of virtual immortality

Cybernetics, "ancestor of post-humanism" (Dixon 147), is an important theoretical approach to analysing digital performance, as it is considered a precursor to transhumanism. The use of interactivity in digital performance and other systems enabled by feed-back processes – a concept devoted to cybernetics along with input and output – is a direct reference to the cybernetic "communication and control" model.

The theoretical cybernetic system developed during and after World War II – as Dixon continues to argue – represented a removal from the mechanistic technological model and a straightening of thought towards communication and control systems that go beyond the boundaries of the object as a physical entity, gearing towards entities of other nature.

> Even the simplest computer-activated art installations use a cybernetic system, and performance artists such as Stelarc use advanced cybernetics, supplanting their bodies with robotic prostheses to engage in a scientific approach to cybernetic human-machine systems. (Dixon 147)

In digital performance art, the boundary between the performer's body and the action – or the output it determines – disappears, and the digital media as an agent of action becomes an extension of the body. Invoking Katherine Hayle's volume, "How We Become Post human: Virtual Bodies in Cybernetics, Literature and Informatics", Dixon points out that the cyber-view of performance art challenges the very concepts underpinning humanistic thinking, namely the idea of a coherent self, of autonomy and freedom, or of a certain sense of responsibility and faith in the enlightened individual interest.

Taking this approach further, an analysis of the boundary between the body and the digital technology that extends it concludes that as long as they are together part of a unitary system of transmission of information, the body and digital technology are one. Neal Harbisson – a visual artist that was born with a total inability to distinguish colors (acromatopsia) – is, arguably, the first official cyborg (see fig. 2).

Fig. 2. Neal Harbisson and the video camera implated in his skull.

Photo: Piero Cruciatti/Demotix/Corbis. *Source*: photo capture Flanagan, Padraic. "Colour Blind Artist Unveils World's First 'Eyeborg' Device." *Telegraph* 16 Mar. 2014: 5–7. Web.

For the first time in history, a person was allowed to appear in an official pasport photo wearing a digital device that allows him to "hear" the colors. In the beginning, he was wearing on himself the technology that made him able to "read" the wavelength of the colors around him: a digital camera mounted on his head; a set of headphones that enabled him to hear the sounds; a laptop in a backpack that was runing the software. As technology progressed, he opted to having technology that captures images and enables wireless communication implanted in his brain, with mobile digital systems processing the information.

From the perspective of physical reality, the merging between man and technology is not perfect but from the perspective of the cybernetic system, it is. In fact, Harbisson claims that through the technology he carries, he feels he has a sixth sense.

If we accept the premise that man and the system – or the technology that allows the transmission of information flow – are one, in the case of telematic performance, the art that take place remotely through videoconference, we can also consider that technology is part of the body of the performer. Embracing such radical thinking leads to the assumption that we have become "post-human", states Dixon. Poshutmanist theory puts emphasis on cognition versus corporeality, the body becoming just a manipulable element, a prosthesis, part of a much larger whole, as Stelarc demonstrates so boldly in his art performance. In "Understanding Media: The Extension of Man", McLuhan states:

> During the mechanical ages we had extended our bodies in space. Today, after more than a century of electric technology, we have extended our central nervous system itself in a global embrace, abolishing both space and time as far as our planet is concerned. Rapidly, we approach the final phase of the extensions of man – the technological simulation of consciousness, when the creative process will be collectively and corporately extended to the whole of human society, much as we have already extended our senses and our nerves by the various media. (McLuhan 19)

Artificial Intelligence, considered to be the intelligence of digital machines or programs, is among the technologies that are growing exponentially, as their development becomes the basis of other, exponential, developments. Ray Kurzweil is representing a group of enthusiast supporters of artificial intelligence and is the co-founder of Singularity University, whose mission is "to educate, inspire and empower leaders to apply exponential technologies to address the great challenges of humanity." He is optimistic about the ability of the human race to achieve a state where technology will merge with the human body to the point where we can no longer see the difference.

AI has the potential to become the source of singularity, an event that is estimated to take place around year 2045.

> There will be no distinction, post-Singularity, between human and machine, nor between physical and virtual reality. If you wonder what will remain unequivocally human in such a world, it's simply this quality: ours is the species that inherently seeks to extend its physical and mental reach beyond current limitations. ... The Singularity will represent the culmination of the merger of our biological thinking and existence with our technology, resulting in a world that is still human but that transcends our biological roots. (Kurzweil 25)

Such thinking is the basis of transhumanism (H +), a concept developed over the last two decades, advocating an interdisciplinary approach to improving human

capabilities through technologies. According to its supporters, technology will enable us to improve, strengthen and overcome biological limits.

> ... technology can allow us to improve, enhance and overcome the limits of our biology. More specifically, transhumanists such as Max More, Natasha Vita-More and Ray Kurzweil believe that by merging man and machine via biotechnology, molecular nanotechnologies, and artificial intelligence, one day science will yield humans that have increased cognitive abilities, are physically stronger, emotionally more stable and have indefinite life-spans. This path, they say, will eventually lead to "posthuman" intelligent (augmented) beings far superior to man – a near embodiment of god."[2]

At first glance, such a philosophy seems to be just a utopia advocated by a group of dexterous exalts looking for a recipe for immortality. On the other hand, however, not too long ago, three of the most renowned science and technology specialists have made extremely important statements about the dangers of developing artificial intelligence and implicitly achieving post-human status. In an interview by BBC in November 2014, physicist Stephen Hawkins, one of the greatest minds of our time, draw attention to the fact that "[...] the development of full artificial intelligence could spell the end of the human race" (Cellan-Jones). Although, due to his disabilities, he was the recipient of a software that uses artificial intelligence to communicate, Hawkins opposed the development of "hard core" applications that, in his belief, could escape control and endanger human life.

Bill Gates, founder of Microsoft, has a similar position: „I am in the camp that is concerned about super intelligence. ... First, the machines will do a lot of jobs for us and not be super intelligent. That should be positive if we manage it well. A few decades after that, though, the intelligence is strong enough to be a concern." (Reed).

Elon Musk – entrepreneur and inventor, founder of Tesla – is also open about his concerns regarding artificial inteligence. In his opinion, „with artificial intelligence we are summoning the demon" (David). Musk, along with many others, is investing his money in an initiative called the Future of Life Institute. Headquartered in Cambridge, Massachusetts, the institute aims to reduce existential risk. It's mission, as state in futureoflife.org is "... catalyzing and supporting research and initiatives for safeguarding life and developing optimistic visions of the future, including positive ways for humanity to steer its own course considering new technologies and challenges."

Among those involved in this initiative are Jaan Talling (co-founder of Skype), Stephen Hawkins (Nobel Prize winner), Mark Zuckenberg (founder of Facebook) and many other signatories to the "Research Priorities for Robust and Beneficial Artificial Intelligence: an Open Letter". The letter was signed by an impressive number of researchers and members of the academic community of the world's largest universities, all expressing support for research priorities that ensure a "robust and beneficial" development of artificial intelligence.

So, there seem to be serious reasons for taking full account of the consequences of an exclusively deterministic-positivist or instrumentalist vision of the future of technology development. We see these innitiatives as an expression of the position Feenberg described in his critical theory model.

Artists are sensitive to the thoughts, ideas and practices of the society they live in. In their art, they express these either in the message they transmit or in the choice of means of expression, sometimes the concept being even more important than the artistic object / act. itself The very essence of art is determined by the artist's sincerity in expressing the most intimate and profound thoughts and ideas.

Stelarc and the imperfect body

Stelarc is not only the most famous performer who represents trans-humanist thinking, but also a promoter of concepts that animate this form of artistic expression. In the performances he has shown on numerous and varied scenes of the world, in art festivals, galleries, museums or public spaces, he best illustrates the relationship between the human body and technology from the perspective of concepts such as extension, disembodiment, amputation, etc.

Since the early 1990s, Stelarc has embarked on a series of experiments involving his own body and analyzing the boundaries of corporality in relation to the environment. These are real-life performance descriptions that have come to pass through the adoption of digital technologies. The relationship between man and technology – be it digital technology or part of the bio-technology or nanotechnology category – has led to the development of surprising, shocking performances.

Fig. 3. Stelarc; Sitting / Swaing. Event for Rock Suspension.

Source: photo capture; 15 July 2015; underneaththesycamore120.blogspot.ro/p/body-figura.html.

In the first performances, Stelarc explored the skin as a boundary between himself and the environment, and – through actions on this surface, applying various

maneuvers – he speaks about building new landscapes, boundary spaces between the human being and the environment. The most spectacular of these are the suspensions, art performances in which he accepted the piercing of the skin with hooks and then the suspension of the body in the so-called public spaces, exploring the limit of supportability, of pain. In his vision, it is intended to be an approach of the duality between the mind/self/will and the body, the latter being the one that can be subjected to the former, which wants to overcome the pain.

Artist and eccentric performer, shocking by his interventions on his own body, Stelard has developed a series of projects that are illustrative for the perspective of Marshal McLuhan's extension theory.

He himself built a third robotic arm that he attached to his right hand. This mechanical arm – digitally operated and presented with all visible threads and connectors – is connected to the Internet network and can be manipulated by people at a distance. Aside from with the construction of that arm parallel to his right arm, his left hand was connected by means of electrodes that can transmit electrical pulses to the muscles. This way, the hand was being amputated by the rest of the body and determined to make movements outside the control of the performer. This performance, which explicitly illustrates the notions of extension / amputation, the disconnection of the mind from the human body and the brain, expresses the social reality in which the individual feels a disconnection between our will and what we can achieve.

Fig. 4. Stelarc; Amplified Body, Laser Eyes & Third Hand; (1985).

Source: photo capture, 15 July 2015, cec.sonus.ca/econtact/14_2/stelarc_gallery.html.

It also expresses the notion of manipulation and helplessness induced by robotization and atomization and a feeling of dismemberment. In the case of the third arm that can fulfill the functions of another organ, we see a visible artificiality and an unnecessary extension, of something that one actually does not need. This amputation

and extension convene an expression of the way we renounce a natural thing, give it to someone else's control, only to adopt other artificial things that eventually fulfill a similar function. In The Third Arm, as in other works (such as The brain and the Insect or Walking Head Robot), Stelarc leaves the technology visible, even highlights it, and does not try to hide the grotesque electronic and mechanical components.

Unlike The Third Arm, The Third Ear is an artistic performance that makes use of technology in a much more discreet way, using advanced biotechnologies and stretching over many years.

Fig. 5. Stelarc; Ear on Arm; Stelarc at the Media Gallery, Concorde University, 2010.

Source: photo capture, 15 July 2015, www.fluxnetwork.net/ear-on-arm-stelarc-at-the-media-gallery/.

As part of this performance, Stelarc implanted in his left arm a raised ear, constructed entirely of human tissues. In time, once the development of the implant is complete, the ear will be connected to the Internet by means of digital technologies. This way, the "ear" will allow some people at a distance to hear everything it hears. The effects of the advanced technologies of biotechnology used are dramatic, huge, significant, while the technological element that has generated them is practically invisible. This has the role of creating shock, surprise and confusion. The audience is puzzled and possibly horripilate, being invited to analyze, understand, to grasp the meaning of the gestures and performances that Stelarc does.

> 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. (Birringer 61)

By the complexity of his performance interventions – and here we are not only referring to the degree of sophistication of the technologies he used or his choice of artistic metaphors, but especially to the depth and complexity of the ideas represented

as well as the application of performance as a social concept – Stelarc is one of the most representative artists of our time and the most important exponent of transhumanist art.

The rapid changes in the society brought by the unprecedented developments of all areas of technology, raise new challenges to making sense of the world around us and – consequently – of the art some contemporary artists such as Stelarc are producing. Feenberg is making an argument for a critical theory approach to technology, enabling a democratic transformation of technology that enables linking interests and values to provide inclusiveness and to ensure a responsible development that would benefit generations to come. His model of describing the theories surrounding the philosophy of technology can be used in the critical analysis of some of the art performances and artifacts that use digital technology, or that have technology as a central subject, especially the ones belonging to the more recent movement that is being called transhumanist art.

Notes

1 https://www.techopedia.com/definition/29066/metcalfes-law.

2 Singularity Symposium, http://www.singularitysymposium.com/transhumanism.html, accessed 22 May 2018.

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