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## **Art as A Playground for Evolution**

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### Abstract

Art works which engage with the topic of human enhancement and evolution have begun appearing parallel to increased awareness about anthropogenic changes to our environment and acceleration of the speed of technological developments that impact us and our biological environment. The article connects *artistic activity* with *play activity* and *evolution*, which are considered on two levels. On the first level, play activity and its beneficial role to evolution is introduced through various science scholars' research. On the second level, artistic activity that engages with human enhancement and related topics is proposed as play activity for adults, which simultaneously experiments directly with ideas concerning evolution and human development. The author proposes that these kinds of experimental art projects support our mental adaptation to evolutionary changes.

### Keywords

Play activity, evolution, technology, art, and human enhancement

### 1. Introduction.

The recent years have witnessed an increase in technological and scientific research in artistic practices, which deal with a manipulation of organisms and their evolution. Today, a large sector of science is developing and experimenting with modification of living organisms at a cellular and molecular level that can lead to changes inheritable by the next generation. Examples of the scientific practices include development of synthetic biology and advancement of life sciences. Similarly, there is an increasing amount of computer-based research into Artificial Intelligence (AI) and Artificial Life (AL) that investigate artificial evolution within technological systems and artificial creatures. Parallel to the science and technology development, recently emerged artistic practices are engaging with equivalent scientific and technological methods and practices. The produced art works experiment with similar methods, technologies, and materials but they also comment on their societal impact and reflect on how these developments may affect our future. The wide variety of interest areas pushing these developments include, among many others, e.g. human enhancement and human evolution that are in the focus of this article. In this article they are specifically addressed from the artistic perspective that engages with the way technological development, such as today's technological

infrastructures, affect the need for experimentation concerning humans and evolution.

The article investigates artistic practices as a potential situation where adults can engage in *play activity*, which is claimed to be an important factor of warm-blooded organisms' evolution and development.

Man shares his playfulness with other warm-blooded animals, with mammals and birds. Insects, reptiles, etc., do not play. Clearly, the division of the forms of life into those that can play and those that cannot is a significant one. Equally significant is the duration of the propensity to play. Mammals and birds play only when young, while man retains the propensity throughout life. My feeling is that the tendency to carry youthful characteristics into adult life, which renders man perpetually immature and unfinished, is at the root of his uniqueness in the universe, and is particularly pronounced in the creative individual (Hoffer 1963.)

## 2.

We are increasingly encountering technological systems in our everyday life that are based on AI to a certain degree. These systems are in continuous learning cycles and evolve further based on their previously learned experiences and accumulated knowledge. With the development of these kinds of systems, we can talk about technology-based evolution.

In natural evolution the primary goal is to survive, which is the driving force behind naturally emerging forms, functions and patterns. With artificially constructed systems and organisms, or creatures, this is different; if there is no goal, and no plan, in what way can we expect them to evolve?

Early computer-based AL experiments -in the sciences and also in the arts- have been typically testing evolution of individuals in a community of diverse creatures living in a shared environment. In these AL-environments existed both predators and prey, all of which reproduced, cooperated, gathered nutrition and died. One of the first and the most well known examples is *Tierra* by Tom Ray<sup>1</sup>. Today, the development in AL and AI is typically grounded on ideas taken from the evolution of biological organisms, such as self-organization and emergence, and being capable of learning and evolving through bodily encounters with the organisms' environment.

The role of **play and playfulness have received fairly little attention within the development of technology** per se, even though the development of **AI and AL have received a lot of inspiration from biological evolution** of organisms, and despite the fact that play activity is claimed to be an important factor of biological evolution (e.g. Bateson & Martin 2013, Bekoff 2001, Morris 1962, Emery & Clayton 2015.) The scientists Der & Matrius have researched the role of playful behavior in self-organizing robots. Their study is based on the idea of open-ended and playful behavior as a crucial feature for the independent evolutionary development of self-organizing robots (Der & Martius 2011.) In their experiments, the use of play and playfulness is comparable to its claimed importance for biological evolution. They claim that in order for a system to

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<sup>1</sup> <http://life.ou.edu/pubs/index.html> [last accessed February 2016]

learn and develop novel possibilities it needs freedom for learning what is the best symbiosis of its body, brain and environment (ibid.)

3.

The author investigates the **relation between play activity as an evolutionary factor and human enhancement**, which is in this article considered as a new direction in the trajectory of human evolution.

During recent decades, human-constructed technological infrastructures, such as networks, have changed the environment we live in, our relation to it, as well as how we perceive ourselves in this technology-infused environment. But these technological developments are also offering us novel possibilities, which may still need to be discovered. Parallel to the anthropogenic changes in environment, we are also making changes to our bodies and ourselves. These changes, even if not necessarily heritable in their character, impact our existence and relationship with the world we live in. Following Der & Matrius's claims on open-ended behavior in technology-based evolution, one can claim that we, humans, are entering a situation which requires us to rediscover **what kind of symbiosis of body, brain and environment is best for us** in today's environment and potentially also in the future.

The art-based research by the author has specifically addressed these issues that emerge within a relation between an organism and its environment, especially when one or both are modified or enhanced. This speculative approach by the author has produced many separate works during the period from 2003-2013 that address human enhancement and/or environmental enhancement.



Figure 1: The Appendix – 2012 by Beloff. A networked tail designed for a human.

As an example, the author's work the *Appendix*, which is a networked tail constructed for a human<sup>2</sup>. This technological device is designed to become a part of the user's physiological body but its movements are controlled by external inputs; a natural phenomenon and by a human-constructed artificial system. The *Appendix* is based on the relationships between the body and technology, and the human and her surrounding environment. It speculates on today's technologically enhanced environment and its relation to an enhanced human body, which in this work are treated as a single entity. Even though the structure of the work is based on technology, it purposely lacks an instrumental use as a means for achieving a predefined goal. It is a playful and aesthetic experiment in which it is not known beforehand what kind of experience it will offer, what it 'means', or if it brings benefits for its users (Beloff 2014).

There are surprisingly few examples of **artistic works**, besides several works by the author, that deal directly with a human body or human enhancement and address the unused potential of technology-based connections to the environment; even though our everyday lives are infused with continuous connections to places, data flows, and people through social media and other online communication platforms. One artistic example is Australian artist Stelarc's project *Ear on Arm*<sup>3</sup>, in which the plan was to grow an ear to his arm

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<sup>2</sup> <http://www.realitydisfunction.org/appendix/index.html> [last accessed February 2016]

<sup>3</sup> <http://stelarc.org/?catID=20242> [last accessed February 2016]

with a help of a skeleton supporting the form and inserting a microphone into the grown ear. The microphone would be online and one could listen to what the *Ear on Arm* hears.

Another example is the *Wearable Forest* by Hiroki Kobayashi, Ryoko Ueoka, Michitaka Hirose (Kobayashi, Ueoka & Michitaka 2009.) This project is based on sound but the physical form of the work is created as a wearable dress, which has embedded technology that interacts with a remote forest using network technology. The work offers an opportunity for users to feel connected with nature regardless of their physical location.

These three examples are initiated as research projects and developed in the field of art. They are playful experiments driven by intuition without clearly pre-framing what the experience with the work or its actual outcome will be.

One could call this play activity.

#### 4.

In recent years the concept of play has regained a lot of attention among academic researchers. It has been widely researched throughout decades e.g. in cultural studies, in game studies, and in animal behavior studies among others<sup>4</sup>.

Throughout decades of **animal behavior studies**, which usually underlie research on human development, **play activity has been investigated specifically in relation to biological evolution** concerning animals and humans.

In the early 1960's Desmond Morris conducted investigations on apes' play activity. He categorized play as a self-rewarding activity, for which the actor, an ape, does not expect any extra gain or reward. "Actions which are usually referred to as play, curiosity, self-expression, investigation, and so forth, come into this category of self-rewarding activities. Most of them are basically physical, motoric outbursts and are fundamentally similar to human gymnastics and sports, except that they lack any ulterior motives such as the obtaining of health, money, or social standing" (Morris 1962.) Morris is well known for his research on apes, especially their artistic activity such as painting, which he described as curious and playful behavior due to its lack of purpose. "[...] actions which, unlike most patterns of animal behaviour, are performed for their own sake rather than to attain some basic biological goal. They are 'activities for activities sake' [...]" (ibid.) Morris' findings point directly to one of our commonly shared understandings of play, namely, that it neither is serious activity nor considered as work. The non-serious aspect, which is often connected to play, has been the reason why we principally have associated play activity with childhood rather than adult life in both humans and animals. However, in recent research it has been recognized that play activity also occurs in adults of many species (Bateson & Martin 2013.) The researchers Bateson & Martin have recently proposed the following definition of play activity: "the behaviour is spontaneous and rewarding to the individual, it is intrinsically motivated and its performance is a

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<sup>4</sup> One of the well-known researchers on the cultural field is Johan Huizinga, whose book *Homo Ludens* presented a very broad understanding of play and its role in human culture (Huizinga 1955.) In general play has a long history of interests starting from Plato, and continuing through Rousseau and Kant, and further to Dewey, Freud, and Piaget among various other scholars up to the recent years.

goal in itself, the behaviour occurs in a protected context when the player is neither ill nor stressed, the behaviour is incomplete or exaggerated relative to non-playful behaviour in adults, and it is performed repeatedly” (Bateson & Martin 2013).

## 5.

Why do humans and animals play when it does not always have a direct and concrete reward? Patrick Bateson has claimed that active engagement with the environment through play supports recognition of objects and construction of useful knowledge of the environment where things move and get rearranged (Bateson 2000).

An applicable example from the field of art is Stelarc’s performance *PROPEL – Body on Robot Arm*, 2015<sup>5</sup>, in which he is attached to a large-scale industrial robot arm. The robot, with Stelarc riding on it, moves according to predefined choreography. In this performance Stelarc is engaging with his environment and novel possibilities afforded by technology in an unexpected way by allowing a robot to take command.

According to research by Bateson & Martin, playful engagement with the environment and other species supports the development of our abilities to rearrange actions or thoughts to create novel solutions, and production of problem-solving skills that are needed later in life for survival and success. Bateson & Martin claim that play activity in childhood makes us more versatile, flexible, creative, and adaptable in adulthood (Bateson & Martin 2013.)

Based on the research by Bateson & Martin **play activity is important for our evolutionary development and survival through developed flexibility and adaptability** to encounter unexpected and new situations.

In the current world, the speed of science and technology developments is continuously accelerating, which will require faster adaptation from us. In what ways can we prepare mentally and physically for coming changes? And, where can we –adults- play? The author suggests that **the field of the arts provides a place for play activity for all ages** by offering us a kind of a mental and physical playground for testing novel scenarios, new ideas, and possibilities for learning with different perspectives. In the experimental art field artists are actively testing and speculating on possibilities that are afforded by newly developed technology-based methods and technological infrastructures.

An increasing amount of human enhancement advancements in science and technology are unfolding in front of us, and it comes as no surprise that artists have also been experimenting with related ideas and concepts. Their approach differs greatly from the field of medical science, in which human enhancement practices are primarily focused on the repair of the body. In other words, the goal of medical repair or modification is a so-called *normal body*; a concept that varies from culture to culture. For example, prostheses are commonly seen as a repair of an injured or incomplete body. It is quite clear that human enhancement in the field of medical and life sciences does not include ideas such as play and playfulness in its activities (Beloff 2014.) However, **in the field of**

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<sup>5</sup> <https://www.youtube.com/watch?v=2bRpTn0KKd8> [last accessed February 2016]  
<http://stelarc.org/> [last accessed February 2016]

**the arts, one can see approaches to human development and enhancement, which can be considered play activity** – e.g. the art works mentioned in this article. Underlying these works, one can perceive a manifestation that human evolution hand-in-hand with environment is no longer bound by the biological survival of a human, but that this development has already taken a path of its own – to follow a vision statement made over 10 years ago by A. Sandberg<sup>6</sup>. Human development through biological evolution is no longer the only approach; humans are actively developing methods and technologies that will impact the evolution of us and other organisms.



*Figure 2:* Two versions of the author's early work *The Head* – 2005-07. *The Head* was an experiment in combining mobile networks and thoughts about human enhancement within networked existence.

In comparison to the sciences, many of the art works dealing with human enhancement emphasize the non-serious and playful aspects of the work, which signals to us that this is play and not real – at least not yet. These example cases in the arts are typically designed for an adult body as external additions to the body and they do not necessarily impact genetic heritage. These **works present scenarios and experiments that support us in adaptation to novel situations** – it is play activity that is beneficial to our evolutionary development and survival.

The French artist Orlan's work throughout recent decades has dealt with the body and cultural ideas about beauty<sup>7</sup>. She has used cosmetic surgery as a method to play with her own image; not to follow the existing western beauty standards but to play with the historical icons of beauty in art. The nine surgeries Orlan has undergone have been setup as performances for video. On the one hand, her work appears as play activity in its creativity and boldness, but on the other hand it is 'real' with real consequences and definitely cannot be considered non-serious or 'only play'.

The idea that artistic activity can be considered play activity and is tightly connected to our evolution is supported also by Bateson & Martin's claim: "Creative people perceive new relations between thoughts, or things, or forms of

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<sup>6</sup> <http://www.aleph.se/Trans/Intro/vision.html>. [accessed September 2015]

<sup>7</sup> <http://www.orlan.eu/> [last accessed February 2016]

expression that would normally seem utterly different. They are able to combine them into new forms, connecting the seemingly unconnected. Play is also about breaking away from established patterns and combining actions or thoughts in new ways” (Bateson & Martin 2013.)

One can say that the artistic works that are concerned with human enhancement or development and which can be defined as play activity, deal with evolution in two ways. The works directly address the topic of human development and propose new perspectives and insights into evolution and manipulation of living organisms. But at the same time these works offer us a much needed playground for activities, which support our mental adaptation to novel scenarios, new possibilities and, potentially, to the next step in our evolution.

## 6. Conclusion.

The first chapter of the article presented technological development in AL and AI, which proposes the emergence of non-human and non-carbon-based entities with potential for evolution. The next chapters reference ideas related to biological human evolution. Play activity and its role in evolution is the central aspect of the article.

Bateson & Martin argue that play activity equips the individual with experiences that enable them to meet future challenges in novel ways (Bateson & Martin 2013). This can also be understood as developed ability to adapt to new ideas and new conditions, mentally and physically. Their ideas and the ideas of various other science scholars on evolution and the purpose of play activity in it, resonate with the author’s proposal to see the creation of artworks, such as those described in the article, that seem to offer no immediate concrete benefits for society, as play activity which has a beneficial role in our evolutionary development. These kinds of artistic activities are capable of proposing new perspectives and insights into our evolution and on-going manipulation of living organisms. But as an artistic practice, which is by its nature public, not only the players (artists) benefit from this creative play activity but also the wider public are exposed to novel thinking through public dissemination of the works and ideas. The art offers a platform for sharing the ideas and produces a context for discussions about them. Play activity within the arts that is taking place in adulthood is also accepted by society, whereas other play activity is more often located in childhood.

Looking today at the world and ourselves, which both are evolving at an increasing pace partly as a result of human-created artificial impact we see that the artworks, which experiment with possibilities of evolution, offer us important possibilities for reflection and mental adaptation to our plausible futures where societal and environmental changes are evermore accelerated.



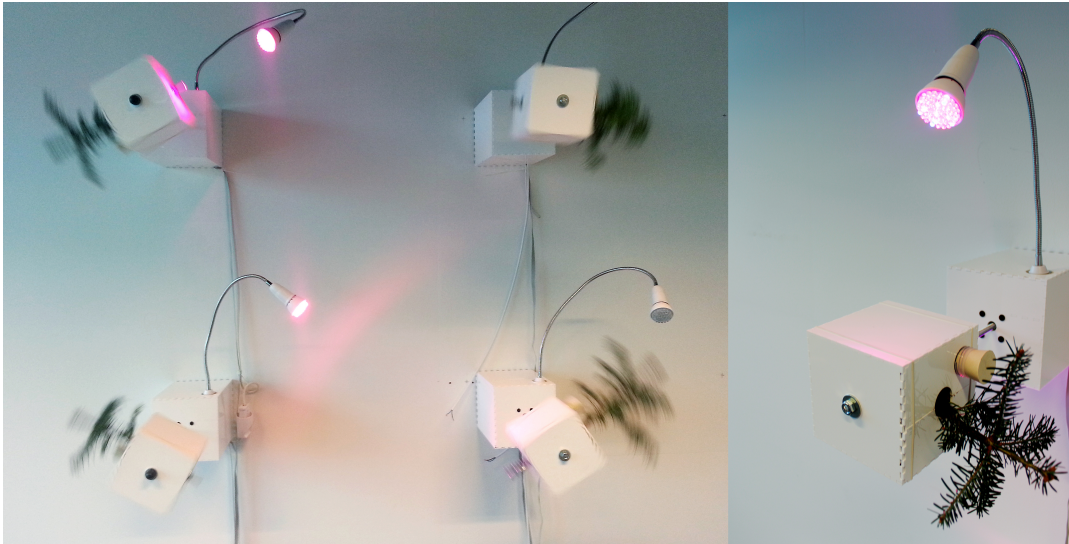


Figure 3: The Condition - 2016 by Beloff & Jørgensen<sup>8</sup>. A recent work by the author, which addresses evolution in non-human organisms and technology created for human perception. The installation consists of cloned Christmas trees located in non-terrestrial micro-gravity condition that is controlled by deep neural network that receives data from space weather satellites.

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<sup>8</sup> <http://investigations.hybridmatters.net/posts/the-condition-cloned-christmas-trees> [last accessed March 2016]

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The author's bio:

Laura Beloff (PhD) is an internationally acclaimed artist and a researcher. Research interests include practice-based investigations into a combination of information, technology and organic matter, which is located in the cross section of art, technology and science. Additionally to research papers, articles and book-chapters, the outcome of the research is in a form of process-based and participatory installations, programmed conceptual structures that deal with increasingly technological world from human perspective. The research engages with the field of art–science–technology including areas such as human enhancement, biosemiotics, biomedica, robotics, and information technology in connection to art, humans and society. Currently, she is Associate Professor and Head of Section at IT University in Copenhagen.  
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