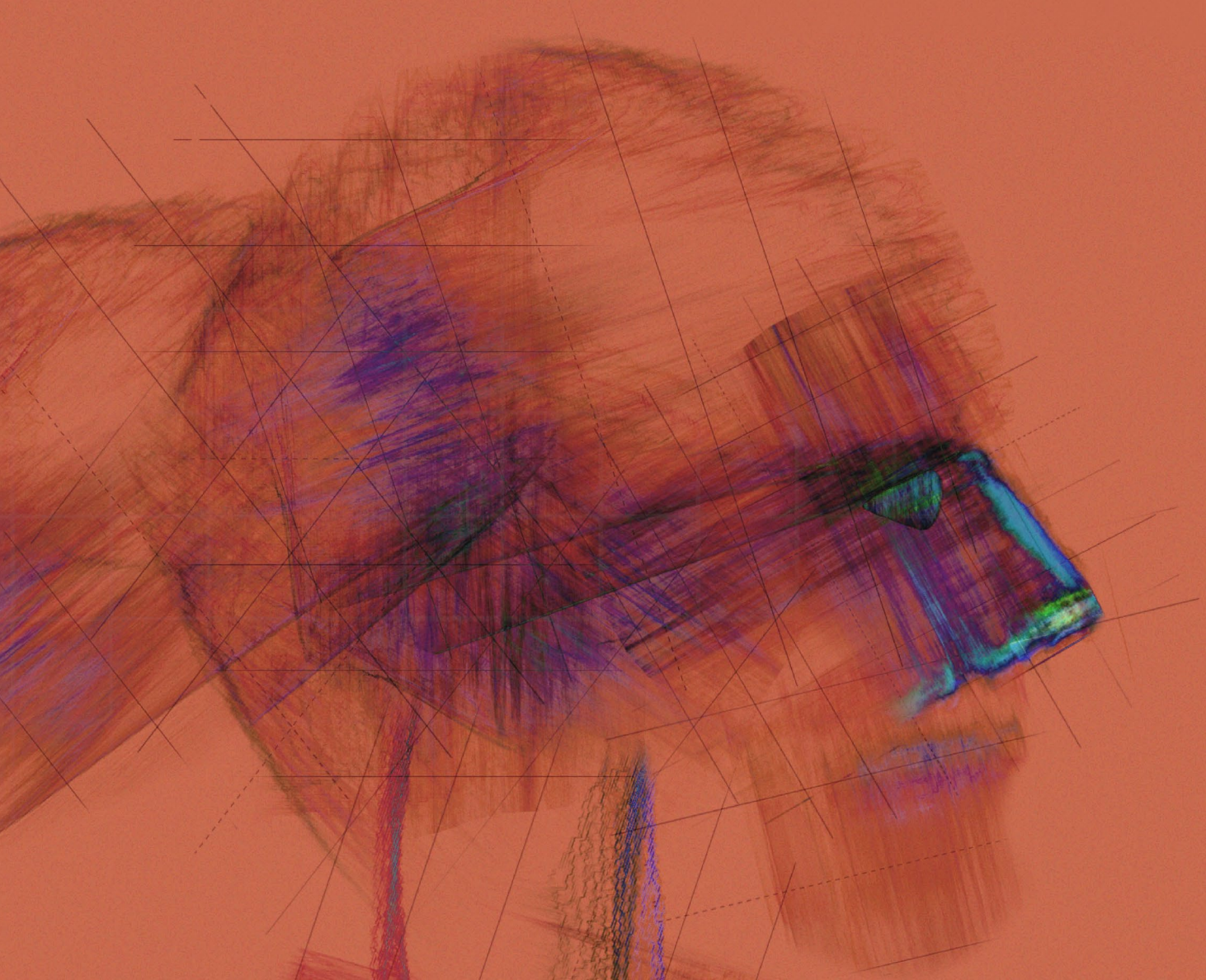
Crossing the Border of Humanity
Cyborgs in Ethics, Law, and Art



Proceedings of the International Online Conference
December 14–15, 2021
Medical University of Łódź, Poland

Edited by

Monika Michałowska

Designed by Nikodem Płaczek

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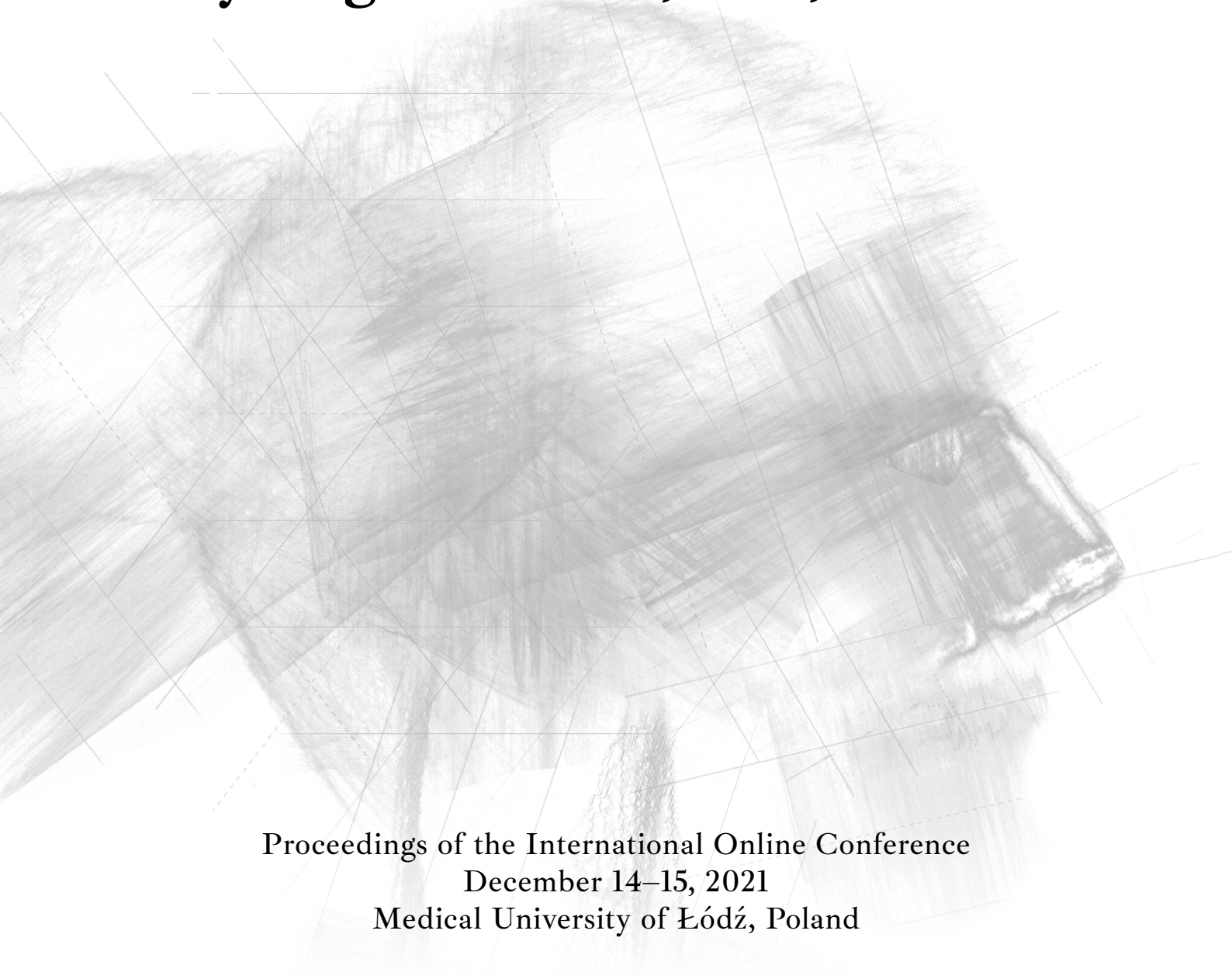

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Preface

This volume presents the proceedings of the international online conference *Crossing the Border of Humanity: Cyborgs in Ethics, Law, and Art* which was collaboratively organized by the Medical University of Łódź and University of Warwick, and held at the Medical University of Łódź, Poland, on 14–15 December, 2021. The conference dedicated to the plurality of views on cyborgs was a follow-up academic event of the online conference *Being One and Many: Faces of the Human in the 21st Century* which focused on the new ideas of the human, transhuman, and posthuman, and was held at the Medical University of Łódź, Poland, on 9–10 March, 2021. At that time, we pondered the ways in which contemporary art, natural science, and philosophy transcend the binary concepts of human-nonhuman, natural-artificial, individual-collective, and normal-abnormal. When in March 2021 we made an attempt to re-examine, re-understand, and re-describe what normal-abnormal, human-nonhuman, and I-we-they mean, facing what resembles the liminal stage of a global ritual, a stage of being in-between—between the old anthropocentric order and a new position of "being many," an idea of extending our discussions to include cyborg-issues was born.

The organization of the conference and putting the proceedings together sprouted during a very unsettling period, when we were facing an ongoing global pandemic of coronavirus disease. While I am indebted to numerous people for their help and encouragement, my special heartfelt thank-you goes to the co-organizers of the conference Steve Fuller and Veronika Lipinska as well as to Steve Mann whose determination and help made the idea of the proceedings real. I wish to thank the speakers of the conference and the contributors of this volume for the inspiration and dedication they exhibited throughout this venture. And finally, I owe a debt of gratitude to my husband for his affection and invariable support.

Monika Michałowska

Introduction

The volume *Crossing the Border of Humanity: Cyborgs in Ethics, Law, and Art* features contributions that explore various aspects of cyborgs in philosophical, bioethical, and legal discourses as well as in artistic projects. The goal of this volume is to offer a place for a passionate interdisciplinary debate on the dimensions of the cyborg and the process of cyborgization that we are witnessing in the 21st century. By presenting this volume to readers, we aim to blur the borders between human (mind and flesh) and machine, as well as to cross the boundaries of various disciplines (professions) and passions (e.g., hobbies) of art, science, technology, law, and humanities. By pointing out its multidimensional character, we wish to provide a forum for mutual inspirations.

The idea of being a cyborg is as alluring as it can be repulsive (at least to some). Literary and pop-cultural visions of becoming a cyborg and becoming a nation of cyborgs have seductively taken hold of our imagination, resulting in a prevalent, yet simplistic, image of a one-laser-eyed being with robotic limbs. This unanimous picture makes it ostensibly evident what a cyborg is and what (s)he/it is not. We are, after all, by no means something like a "Borg"!

The word "cyborg" is a portmanteau of the words "CYBernetic" and "ORGanism" coined by Manfred Clynes (1960), who proffered the case of a human riding a bicycle as his favorite example (Gray, 1996, p. 49; Gray, 2021). Arguably, cyborgs have been around for more than 200 years. Some authors take a step further and consider a vessel (raft or boat) as much an extension of the body as a bicycle to claim that cyborgs have been around for more than a million years—longer than even *Homo sapiens*, and before the invention of clothing (Mann et. al., 2021). If we regard the vessel as defining a boundary or border between humans and their surroundings, then the concept of the cyborg is in fact defined in regard to "Crossing the Border" of clothes, skin, and surface (i.e., human-machine interface or air-water interface). This "Crossing the Border" framework gives us a fundamental taxonomy of cyborgs: a Type I cyborg is one in which a human enters a vessel or other vironment (e.g., boat, "wearables," spacesuit), and a Type II cyborg is one in which a vessel enters a human (e.g., "implantables"), or hybrids of Type I and Type II (Mann et. al., 2021). Implied in either case is the notion that the vessel/vironment is part of the cyborg, i.e., the principle of self-ownership as an extension of the concept of "morphological freedom," which is also a cornerstone of the emerging "transhumanist" sensibility. It is also worth observing that a similar distinction can be drawn concerning

non-human animals as cyborgs, whereby Type I might include Laika, the canine cosmonaut from the early days of the Soviet space program, and Type II might include the range of "uplift" technologies that have been proposed to enable animals to communicate better with humans (Chan, 2009).

While the commonly adopted definition of a cyborg as a hybrid of the mechanical and the biological seems to leave no doubt about what a cyborg really is, it appears to be sparking more controversies rather than solving them today. Philosophy, in which we seek the ontic foundations of various entities, does not untie all the cyborg-related definitional knots. The philosophical notions of the cyborg, which tend to be based on what the linguist Laurence Horn calls "asymmetricalist" accounts of negation, view the cyborg as non-human, where "human" is the positive term and "cyborg" is defined simply as not being that (Horn, 1989). However, this semantic state of affairs is clearly not adequate.

In our world, where cyborgs walk among us (or where we may all be cyborgs by choice or not), the maze of cyborg-issues is becoming ever more tangled and expands beyond the definitional dilemmas to reveal a burgeoning panoply of problems: the restorative/elective facet of cyborganization, an enhancing/curing aspect of becoming a cyborg, the legal status of cyborgs, and hesitations over whether one's "cyborg" status needs to be visible or can be invisible.

The line between therapy and enhancement seems to be blurring now that we have entered a new era of existence in which technological breakthroughs question the rigid and obsolete concept of the human. The ubiquity of cyborganization in our daily activities prompts philosophers, ethicists, bioethicists, lawyers, and artists to probe the new and the unknown we are facing.

Another important consideration is the extent to which we may be forced to become cyborgs. We can no longer live in the modern world without being forced to adopt some form of technology. It is not hard to see a future where one must wear or carry a smart device, or even in the future be implanted with one.

This volume challenges some of the notions we have developed about cyborgs, which are often underpinned by simplistic and simplifying dichotomies of various nature: philosophical, scientific, technological, legal, and artistic. It creates an opportunity to articulate problems we have to face as humans and cyborgs, recurrent yet still thought-provoking questions, and insights that help us build a platform for the cross-pollination of ideas.

What is a cyborg?

a new form of evolution? the end of the human species?
a new version of personhood? a denial of personhood?
a transition from a human person to a cyborg person?
a trans-human?
a cyborg citizen?
a liminal specimen? a mainstream specimen to be?
a genetically/technologically enhanced form of being?
an enhanced human?
a human with restored capabilities?
will becoming a cyborg make us more human and humane?
less human and humane?
the doom of humanity?
the future of the person?
what we will become in the future?
what we have already been for more than a million years?

We pose all these unsettling questions, but we by no means promise answers to them all. Our goal is far more modest; we only wish to dismantle the binary and anthropocentric perspectives to seek and (if we are lucky) to unriddle the cyborg-puzzle. This is a journey we as individuals and as the authors of the volume are eager to take and invite you to join. We hope it will be a chance for all of us to boldly go where nobody has gone before.

Monika Michałowska, Steve Fuller & Steve Mann

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Cyborg as a Self-Made Monster

Anna Alichniewicz

Key Points

"Technology may alienate us from ourselves, dehumanizing us and turning us into self-made monsters of a new sort altogether." (Asma, 2009, p. 263) In this quote, coming from Stephen T. Asma's book *On Monsters*,[1] both technology and monsters seem to be viewed negatively but at a closer look the affinity between monsters and the technological products called cyborgs appear quite ambiguous.

Multidimensional Nature of the Monster

Criticizing some biotechnological procedures, Leon R. Kass characterized them as "offensive, grotesque, revolting, repugnant and repulsive" (Kass, Wilson, 1998, p. 17) and the same set of adjectives has been employed to describe monsters. However, those epithets refer to only one side of monstrosity, while the other is that of their being intriguing, fascinating and desirable. From etymological point of view, there is nothing pejorative in a term "monster," since a Latin noun *monstrum* is derived from a verb *monstrare*, meaning "to show" and also from a verb *monere*, meaning "to foreshadow" and "to portend." Thus, it can be seen that the notion of monstrosity and the monstrous is rather complex.

Some historical periods have expressed greater, some lesser fascination with monstrosity and the monstrous, nonetheless, monsters inscribed on various interpretative discourses have been omnipresent in the history of culture. What is more, even though each historical period has manifested its favored discourse, other discourses are never totally mute. Thus, naturalistic, symbolic, aesthetic, theological, scientific and medical narratives are not diachronic but rather synchronic and the progress in natural science has not erased the display of mixed emotions, from surprise and repulsion to admiration and fascination that monsters have evoked. Even if monsters can be produced in the scientific laboratories nowadays, they retain their puzzling and challenging character.

The question arises as to the reason for an everlasting mixture of repulsive and propulsive feelings evoked by the monsters. It seems that the reason for their unfading attractiveness is a combination of both common and unique characteristics possessed by a monster. Moreover, it should be noted that although the notion of monstrosity refers primarily to the bodily strangeness, it does not necessarily mean any deformity, since it could have related to something extraordinary because unusual and unknown.

[1] It seems significant that a The New Yorker reviewer referred to his book as to "a modern-day bestiary."

Contingency of Bodily Forms

Noticing the importance of common bodily form, Maurice Merleau-Ponty emphasizes the significance of recognizing the Other through identification of bodily powers. Encountering another human being, I am able to recognize her/him as the *alter ego* by identifying the same set of the bodily powers as the one I have. That seems to be the core of the ability to recognize each other as *semblables*, as Merleau-Ponty put it (Merleau-Ponty, 1964, p. 10).

Margrit Shildrick has pointed out that it is not a difference but the disturbing familiarity of the monster that provokes the repulsive-propulsive reaction (Shildrick, 2018, p. 170). Bernhard Waldenfels has noted that the closer the Other, the stronger activation of the boundary between the spheres of ownness and alienness is caused (Waldenfels, 1997, pp. 43–44). Thus, monsters can be regarded as both a result and an indicator of the contingency of life forms. Kevin Warwick, a professor of cybernetics at the University of Reading, who has implanted microchips in his body to communicate himself with the computers in his laboratory, says: "I was born human. But this was an accident of fate—a condition merely of time and place. I believe it's something we have the power to change" (Asma, 2009, p. 261).

Monsters and Cyborgs

Thus, both monsters and cyborgs have a paradoxical character combining the disgusting with the desirable. They share some qualities, which are considered repulsive but on the other hand, they elicit fascination as the ones that transcend the limits of the species. Georges Canguilhem indicated a risk that the knowledge how to create monsters could become "the sport of scientists" (Canguilhem, 2005, p. 191). From this point of view, cyborgs seem a perfect manifestation of the monstrous. However, their quest for transgression and their urge to cross the boundaries of human qualities and skills can also be appreciated. Monsters were often regarded as the indication of god's power to play on the natural order. In the same vein, cyborgs can be considered a token of human transgressive power to open up unpredictable capacities.

In phenomenology, the body is conceptualized as a transcendental principle of experience, making the very experience possible, which means that what can be perceived and thought about the world is shaped by bodily capacities. According to Shaun Gallagher and Dan Zahavi, both capacities and limitations of the body "define the environment as a world of affordances" (Gallagher, Zahavi, 2012, p. 156), but the bodily set of capabilities is neither static nor closed. On the contrary, the body can extend its abilities and the scope of experience and affordances not only through acquiring new skills but also by incorporating or, as Drew Leder puts it, by annexing some technological artifacts as artificial organs. Leder says: "a phenomenological anatomy cannot then be thought of as fixed over time, or even confined by the physical boundaries of the flesh. It must take account of the body as living process" (Leder, 1990, p. 30).

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Cyborgs and Law: Reflections and Musings

Woodrow Barfield

Abstract

This paper provides a short introduction to issues of law which relate to cyborgs. The discussion focuses on rights for cyborgs in the context of constitutional and human rights law and the law which relates to cyborg bodies and cyborg minds. The paper also discusses issues associated with data mining of the cyborg mind and the possibility of self-incrimination in a criminal proceeding when the mind itself may be accessed by a third party.

Introduction

As more people are equipped with cyborg technology important issues of law are raised which are leading to the development of what I term a law of cyborg embodiment and a law of cyborg minds. To orient the reader to this discussion on legal rights for cyborgs (Barfield, 2015), there are different definitions and conceptualizations of what comprises a cyborg (see Mann, 2001), but for purposes of this paper I discuss legal issues associated with two different types of cyborgs (there are of course, other ways to categorize cyborgs and there are other types of cyborgs as discussed within this proceedings). To begin, I describe cyborgs as people equipped with "cyborg technology" worn on the surface of their body (which more and more is integrated into the functions of the body), or people with "cyborg technology" implanted within their body. A cyborg created by nature of implanted technology: (1) has technology which operates as a closed-loop system, (2) the technology increases the computational ability of the body or mind, (3) the technology is upgradeable (both hardware and software), (4) more and more the implanted technology allows other technology to be controlled using thought (such as an arm or leg prosthesis controlled by a BCI), and (5) the cyborg device is wireless (Barfield, 2015). For cyborgs equipped with a wearable visual display, the display can be used to assist them in transforming or mediating the world viewed using video or through see-through optics (Mann, 2001). Given the law will be significantly challenged by cyborgs entering society with various abilities, a main question to address is how the law may apply to different transformations of humans as they become more equipped with cyborg technology? Another important question is how existing rights, such as those expressed in human rights, statutes, and regulations will apply to cyborgs, or will new law need to be developed to account for cyborg abilities?

I first introduce some broad concepts of cyborgs. There is a historical trend for the migration of technology from the external world to the surface of the body, and more recently to within the body itself. Some have argued that the use of technology external to an individual, such as a boat or more recently a bicycle, creates a cyborg (see Mann, 2022). On that point consider the first primitive tools used around 3.3 million years ago by our distant ancestors (Barfield, 2019). Further, as an example of technology worn on the surface of the body consider a digital tattoo which can be outfitted with electronics such as sensors or a near field communication chip. Or consider a smartwatch which can monitor heart rate and distance traveled using a pedometer. As an example of technology implanted within the body, consider the prototype artificial hippocampus being developed by Theodore Berger and colleagues (2011) which is being designed to aid patients with Alzheimer's disease. Here, there is a clear medical necessity motivating the development of the artificial hippocampus. However, of importance for cyborgs, implantable technology used for medical purposes today, may serve another purpose tomorrow. Thus, a future version of an implanted device for medical reasons such as an artificial hippocampus, could be used to enhance or alter the memory of a person not suffering from brain disease or brain damage. But if the artificial hippocampus was accessed by a third-party, important questions of cyber-security for the brain itself as well as constitutional and human rights issues for freedom of thought and of memory would be raised.

Additionally, cyborg technology implanted within a human body is often controlled by algorithms and other AI techniques, which raises challenging questions for the law to consider. On this point, a recent paper by Soekadar et al. (2021) discussed the idea of a hybrid mind in which the human brain and mind coexists with an artificial cognitive system. So, in the future, how will the "hybrid nature" of the "cyborg mind" affect legal rights? For example, if software from a third party is downloaded into a neuro-prosthesis which then assists the individual in the creation of intellectual property, who would be considered the author or inventor?

The Law of Cyborg Bodies

If we consider cyborgs that have technology visibly integrated into their body, we may ask, do intellectual property or other laws apply to the resulting form or embodiment of the cyborg? On this question an area of law which should be explored for cyborg embodiment is the legal right to *bodily integrity* which, among others, is understood as a right against significant, nonconsensual interference with one's body. For example, several states in the US have proactively adopted legislation which prohibits employers from requiring microchips as a mandatory condition of employment.

In addition, for the law of cyborg bodies (or embodiment), the physical appearance of the cyborg, or in patent terms, the ornamental design, is applicable. An ornamental

design patent may encompass various aspects of the "look and feel" of a cyborg, such as the shape of the cyborg as reflected by cyborg technology visibly worn on the cyborg's body. "Ornamental" in this case means the visual appearance of the technology used to create a cyborg or as explained in the Manual of Patent Examination Procedure the appearance presented by the article which creates an impression through the eye upon the mind of the observer. To be deserving of a patent, a design must be original, novel over the existing designs (known as "prior art"), ornamental, and must not be an obvious variant of any existing design. Further, the "ornamentality" requirement means that the design *must not* be solely dictated by function. Cyborg technology, whether worn on the surface of an individual, or implanted within the body, may also receive protection as a utility patent which focuses not on the *appearance* of the cyborg technology but on the *function* of the cyborg technology. And while a utility patent filed on the functional aspects of cyborg technology is the most common patent application; ornamental design patents recognize the importance of protecting the significant time and effort that goes into designing the look of technology; Steve Mann, for example, has invested significant time and resources in developing his wearable technology.

Under intellectual property law the form or embodiment of a cyborg may also be the subject of copyright law. While copyright does not protect the mechanical or utilitarian aspects of works of an author (as a utility patent does), copyright law may protect pictorial, graphic, or sculptural authorship that can be identified separately from the utilitarian aspects of an object. Further, under US copyright law a cyborg used in a story may be considered a "stock" character, and as such would not rise to the standard of creativity for copyright protection until the author added something more.

The Law of Cyborg Minds

With continuing developments in implantable devices that interface with the brain, there is the potential for a third party to access or edit the content of a cyborg's mind. This, of course, raises significant issues for the law to consider not the least of which implicates the privacy of the mind and the concept of cognitive liberty. Bublitz (2015) refers to the right of cognitive liberty as the freedom of an individual to control his or her own mental processes, cognition, and consciousness. And according to Sententia (2004) *cognitive liberty* is a fundamental right because it implicates the right and freedom to control one's own consciousness and electrochemical thought processes which he noted is the necessary substrate for other freedoms. Recently, some have also called for the recognition of a legal right to mental integrity which is a right against significant, nonconsensual interference with one's mind. Another important right for cyborgs is the right to *psychological continuity* which aims to preserve personal identity and the coherence of the individual's behavior from modification by a third party. The right to psychological continuity is a special neuro-

focused example of the right to identity which is recognized in the EU and was developed by the European Court of Human Rights from the right to private life included in Article 8 of the European Convention on Human Rights. Article 8 protects against unwanted intrusion and provides for the respect of an individual's private space. Further, the EU addresses privacy concerns with the GDPR which provides protections to EU citizens from privacy breaches by companies that process personal data of individuals residing in the EU. And international human rights law formally recognizes the right to privacy, which is implicated by the use of cyborg technologies. The Universal Declaration of Human Rights (UDHR) states that "no one shall be subjected to arbitrary interference with his privacy ....". And everyone has the right to the protection of the law against such interference or attacks" (Article 12). Also, the EU Charter of Fundamental Rights, adopted in 2000, specifies in Article 8 that "everyone has the right to the protection of personal data concerning him or her" (para 1). From this arises the fascinating question of whether within the context of current privacy protection standards, does the traditional right to privacy also cover the data contained in and generated by our minds and which may be accessible by cyborg technology?

Data-Mining Cyborgs and Self-Incrimination

If we consider that cyborg technology implanted in the brain could access and record at the level of neurons, there is no specific legal or technical regulation which is targeted to protect brain data from being subject to data mining or privacy intruding measures. This is worrisome considering recent cases in which judges have indicated that pacemaker data could be used as evidence in a court proceeding allowing the government access to the data on the functioning of a person's inner body. This is also worrisome given that in India a brain scan was used as evidence to convict a defendant of murder; the judge concluding that the suspect's brain held "experiential knowledge" about the crime that only the killer could possess (Saini, 2009). Within criminal law, access to the mind via cyborg technology also implicates the issue of coerced self-incrimination which is widely recognized as being an integral component of due process in a criminal justice system (see Farahany, 2012, discussing the Fifth Amendment to the US Constitution). People suspected of a crime do not have any obligation to assist in providing evidence against themselves, yet technology implanted within the brain could provide such evidence. Several sources of law offer protection for self-incrimination (and the question is whether they apply to cyborg technology): the International Covenant on Civil and Political Rights, which stipulates that "in the determination of any criminal charge against him, everyone shall be entitled (...) not to be compelled to testify against himself or to confess guilt" (Art. 14(3)(g)). And the European Court of Human Rights (ECtHR) has stated that this principle is implied in the general right to a fair trial, which is guaranteed by Article 6 of the Convention.

Summary

As we move forward, the creation of cyborg rights is necessary to protect against possible misuses of cyborg technology as well as to provide the fundamental right of cognitive liberty to cyborgs. Considering rights for cyborg bodies and minds as a bundle of rights, they should include the right for the protection of cyborgs from the coercive and unconsented use of cyborg technologies, the right to mental privacy and the right to psychological continuity for cyborgs. In addition, rights as found in international humanitarian law, criminal law, tort law, property law and consumer law may be used to protect the rights of cyborgs. Finally, while new rights will be necessary as more cyborgs enter society, intellectual property rights will apply to the cyborg's embodiment and creative works.

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From Cybernetics to Cyborgs and the Problem of Cishumanity

Steve Fuller

Cybernetics as the Prehistory of Cyborgs

Norbert Wiener founded cybernetics as an interdisciplinary science based on what he took to be an isomorphism in the means by which humans, animals and machines maintained their autonomy against a changing environment. (For reasons to be explained below, I shall retain Wiener's original tripartite way of conceptualizing the domain of cybernetics—in which "human" remains separate from both animal and machine.) Indeed, Wiener thought of this isomorphism in mathematical terms, which implied that in principle a human, animal or a machine could serve as a model for any of the other kinds of beings. We are most familiar with this idea as "Artificial Intelligence" (at least in its classical phase), in which the machine serves as the model of the human. However, biology had already become familiar with this conception through the idea of the "model organism," formally introduced by Thomas Hunt Morgan, who established the first population genetics laboratory at Columbia University in the early twentieth century. On the basis of the humble but fecund fruit fly, many generalizations have been drawn about heredity across many animal species, including *Homo sapiens*—for both good and ill. Morgan had been influenced by his former colleague Jacques Loeb, whose own comprehensively mechanistic view of life inspired his University of Chicago student John B. Watson and successive generations of self-styled animal and human "behaviorists."

Another strand of the prehistory of cybernetics worth mentioning is the appropriation of thermodynamic—more specifically, "general equilibrium"—models from physics to economics, which had begun in the final quarter of the nineteenth century. But there were also spillover effects into other disciplines, not least Sigmund Freud's psychoanalysis. But perhaps of more direct relevance to the history of cybernetics was the work of Vilfredo Pareto, a political economist with a background in civil engineering, who ambitiously tried to build an entire theory of society around the idea of general equilibrium, which he believed was naturally achieved over time, often against the intentions of the historical agents themselves. But unlike Hegel, who equally believed that such a "cunning of reason" operated over the entirety of history (whenever that ends), Pareto envisaged societies as "closed systems," which he equated with organisms. Herbert Spencer already had a version of this view but lacking the relevant mathematics it seemed purely speculative.

Through the biochemist Lawrence Henderson, who translated Pareto into English, this way of thinking made its way to Harvard's Medical School in the early twentieth century, where it dovetailed with large philanthropic projects—especially by the Rockefeller Foundation—designed to stabilize worker productivity in a period of social upheaval, partly caused by political turbulence but more importantly by the "creative destruction" of markets by ceaseless innovation. A Henderson protégé who was a transitional figure to postwar cybernetics was Walter Cannon, who coined the term "homoeostasis" to update the vision of the nineteenth century founder of experimental medicine, Claude Bernard. Bernard had defined life itself in terms of the interface maintained between an "internal" and an "external" environment, the former of which we call "physiology" and the latter "ecology." Death occurs when the interface dissolves. This insight is the source of the cybernetic idea of "system boundary," the maintenance of which constitutes the integrity of a properly functioning ("autonomous") organism.

After the Second World War, the political and financial focus on what became cybernetics shifted from the private foundations to the federal government (especially the CIA) as part of the emerging Cold War effort. Here another Henderson protégé, Talcott Parsons, tried to turn Harvard's social science faculty into the hub for "systems theory," which served to turn the emerging cybernetic worldview into an interdisciplinary unit. To cut a long story short, a variety of fields, from operations research to artificial intelligence were fostered in this context, even though Parsons' original dream of a cybernetic social science was never fulfilled. However, it continues to live in the minds of the followers of one of Parsons' visiting overseas students, Niklas Luhmann.

The Cyborg as the Epitome of Cybernetics

In turning from cybernetics to cyborgs, it is worth recalling the crucial role that mathematics has played in levelling ontological distinctions between humans, animals and machines. Of course, one can make various moral and political arguments for levelling such distinctions, based on metaphysical ideas of existence, value and rights. Bruno Latour and Donna Haraway are great at that sort of thing. However, without the requisite mathematics in place, it is difficult to make the relevant translations across embodiments to make it all work. It is fine to say that humans, animals and machines are all "equal" as a metaphysical gesture. But in practice, it is difficult to implement if one does not understand the implications, say, for energy use in an environment with scarce resources—and the conditions under which such energy is to be supplied, funded, maintained and monitored. The ground for these judgements is prepared by the mathematics of the situation, which define the relevant exchange relations: What is taken to be equivalent to what, when two differently embodied beings make claims over the same resources to sustain their existence? This question opens into the still underexplored field of "cyborg law," which has so far focused on issues related

to harm but over time is likely to reshape altogether what it means to be subject to "equal treatment under the law."

In this regard, the contributions of Norbert Wiener may be understood as potential principles of a "cyborg economics." But from the broader horizon of the history of science, we might think of Wiener as the Kepler of cybernetics, understood as a field that has yet to find its Newton. What I mean is that Wiener figured out the basic equations that govern humans, animals and machines at the most abstract level, without ever solving how these multiply embodied beings could coexist in one world. That is the work to be done by cybernetics' answer to Newton, whose singular achievement was to unify the motions of earthly and heavenly bodies under a common set of laws that overcame their differences as phenomena to constitute all physical reality as a "world-system." From the standpoint of completing the cybernetic vision in this fashion, cyborgs are both simplifying and complicating factors.

The crucial point about cyborgs is that they demonstrate in quite individualized ("hybrid") ways the fundamental unity of human, animal and machine. One might even see cyborgs as *symbols* of the achievability of the cybernetic vision in its full-blown "Newtonian" sense. That is the simplifying part. The complicating part is that before the cybernetic world-system is achieved, many cyborgs will have been brought into the world, challenging the conventional metaphysical separation of human, animal and machine. Put crudely, the politics and the economics of the situation are running ahead of the knowledge needed to judge the feasibility of various actual and proposed cyborg-oriented technologies. While much of the relevant research happens in legitimate medical and engineering settings, much is also happening "DIY" (often under the cover of "art") and in bioethical regimes that depart somewhat from the Western norm (e.g., Russia and China). Taken together, it is hard to determine exactly what is being done, has been done—let alone, a reliable record of outcomes.

Nevertheless, as cyborgs in all their diversity become more visible—and attractive—a moral claim for "elective cyborganization" is likely to become more prominent, whereby disability is no longer necessary to provide the pretext for the radical functional transformation of the body of one's birth. "Transhumanism" is a convenient banner under which to capture this emerging attitude. In that case, we may witness a return to the bioethical sensibilities of fifty or more years ago, when Yale neuroscientist José Delgado, among others, were predicting—in a hopeful spirit—that the "psychocivilized" society of the future will feature both externally worn and internally planted monitoring devices to regulate our well-being. Interestingly, these early hopeful predictions did not clearly distinguish between what Steve Mann has called "Type I" (wearables) and "Type II" (implantables) cyborganization—perhaps because both types were clearly implicated in the available technology. However, the distinction is quite profound at both a metaphysical and a psychological level.

Twentieth century comic book superheroes offer an interesting angle from which to view the cyborg types. The two most popular superheroes—Batman and Superman—can be understood as Type I and Type II cyborgs, respectively. In biological terms, Batman's various wearables—from cape to car—constitute an extended phenotype, whereas Superman's extraterrestrial ancestry and repeated exposure to radiation constitute an altered genotype. This difference results in rather contrasting psychological profiles. To be sure, both have troubled relationships with "ordinary" humans, even when they self-present as humans. However, Batman is notable for the mental preparation he needs—often presented as brooding —before he inhabits the relevant wearables, whereas Superman typically needs to restrain himself when dealing with humans outside of a "heroic" context, especially in his guise as Clark Kent. This difference points to alternative ontological default settings for cyborgs. Most people would probably say that Batman is an enhanced human, whereas Superman is a non-human being. One has the sense that the former needs to "scale up" from humanity and the latter to "scale down" to humanity.

From Cyborgs to BeyondCishumans? Towards Turing Test 2.0

A notable feature of both superheroes is that while each in his own way suffered childhood trauma, and so might be seen as psychologically damaged, neither is physically disabled, unlike those who typically become cyborgs. Yet, here too we see an emerging division between those who like Steve Mann (a Type I cyborg) who still regard themselves as human and those who like Neil Harbisson (a Type II cyborg) who regard themselves as a non-human entity, with which he associates the name "cyborg." There are undoubtedly many issues at play in the two cyborg cases, but in what follows I will focus on the ontological ones. As Aleksandra Lukaszewicz and Pawel Fortuna showed at this conference, when the human is taken as the standard of personhood, the cyborg (which in their study was represented by Harbisson himself) is regarded as slightly "less" of a person, in that it scored somewhat less in terms of the two Aristotle-inspired dimensions into which personhood was decomposed for purposes of the study: agency and experience. One can perhaps see why Harbisson might want separate cyborg rights.

However, more fundamentally, the finding raises the question of whether the human *should* be taken as the standard of personhood. Lukaszewicz herself thinks not, so on that principled basis she supports Harbisson's claim to a distinct kind of personhood. Moreover, she proposes to achieve this via a "Turing Test 2.0," an idea she gets from me. But my aim in proposing the test is to extend the status of humanity to beings not born as humans—in other words, to negate any sense of *cishumanity*, such that in principle any entity might transition into humanity if they pass "Turing Test 2.0." The difference between our two uses of "Turing Test 2.0" is significant. However, let me first mention the similarities.

In both our cases, "Turing Test 2.0" is a kind of inversion of the original Turing Test, which was about designing a protocol to distinguish a man from a woman—and later a human from a machine—based simply on identity-concealed responses to questions. Turing's point was that this task is harder than it seems. Over the past seven decades, many artificial intelligence and cognitive science researchers have tried to rise to the challenge, with decidedly mixed results. Already in the 1960s, it was discovered that people in need of psychological counseling easily attributed humanity to ELIZA, a computer program that used a relatively primitive algorithm to provide responses to patients' concerns. Arguably *Blade Runner's* Voight-Kampff Machine represents the filmic apotheosis of all these efforts. In contrast, Lukaszewicz and I turn the Turing Test into a kind of "citizenship test" for ontological aliens. Put bluntly, the point of "Turing Test 2.0" is to enable the replicants to pass as humans, as viewers are finally led to believe of the person entrusted with tracking down replicants in *Blade Runner*.

The issue that divides Lukaszewicz and me is the domain of ontological citizenship to which a candidate entity would be entitled by virtue of passing "Turing Test 2.0": humanity or personhood? I do not pretend to resolve this rather deep matter, but let me end by raising four considerations when thinking about this question:

(1) The modern framework of legal rights is anchored in the individual human as the paradigm case of personhood. Whenever one grants rights to, say, animals, machines or corporations, their personhood is defined in relation to the paradigm case, even if negatively (e.g., rights of wild animals to sanctuary from humans).

(2) If "Turing Test 2.0" is to qualify a candidate entity for personhood rather than humanity, then over time it should be possible to develop a version of the test that could be administered by non-human persons who have already been incorporated into ontological citizenship.

(3) The concepts of humanity and personhood started to be seen as so distinct, only once humanity was identified with—I would suggest "reduced to"—*Homo sapiens* in the mid-eighteenth century. Even well into the nineteenth century, it was common to attribute humanity to animals and even hypothetical extraterrestrial beings. The main problem has been that not all members of *Homo sapiens* have been treated as human, but that problem remains today.

(4) The underlying metaphysical dynamics of humanity and personhood are rather different. Humanity has historically been a criteria-driven concept, originally tied to self-comportment in the classical world and the treatment of others in the Christian world. The educability of candidate humans has been a strong feature of both; hence, the prospect of "transitioning" to humanity. In contrast, personhood is much closer in spirit to what Ana Maria Guzman Olmos called in her presentation, following Gilbert Simondon, the "technicity of concept." The intuition here would be that personhood is subject to multiple outworkings ("operations") in the world, each of which is legitimate in own right without needing to be derived from the others.

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Cyborgs and Their Limits

Klaus Gärtner

Introduction

For a long time, sci-fi culture has entertained the thought of crossing humans and machines, giving rise to the idea of cyborgs. This is often portrayed in animes like *Ghost in the Shell* or movies such as *Star Trek*. However, with recent advancements in technology, we are now seeing actual developments towards enhanced or cyborg-like human beings. One instance of this new development is cyborg activist Neil Harbisson who implanted an antenna into his skull to be able to "hear" colors. This is one of many examples that makes it clear that we are not dealing with the question of whether or not humanity is becoming the "Borg," but with those cases of humanity slowly inter-tangling with technology.

In the light of these changes, the question about what cyborgs really are is gaining more and more importance. In this paper, I seek to provide one small, limiting condition for what can count as a cyborg. To do this, I will first introduce an array of ideas of what could fall under the cyborg-concept. In a second step, I will frame the issue of a cyborg-concept within the recently introduced Mind-Technology Problem (Clowes, Gärtner and Hipólito, 2021). This successor problem to the Mind-Body Problem (Descartes, 1991, 1998) claims that we need to re-conceptualize the nature of mind and its relationship to technological artifacts by asking ourselves how the mind is transformed, extended, enabled or even diminished by our advancing (smart) technologies. I will then limit the scope of my investigation to one element of the mind, i.e., consciousness. Here, I will not rely on just any generic notion of consciousness, but the idea of phenomenal consciousness or "what it is like" to undergo experiences (Nagel, 1974). I think that this idea of consciousness is particularly helpful because it allows me to investigate an essential part of complex carbon-based minds including humans. Finally, I will explore the question how consciousness and human technological enhancement interact. The goal is to think about possible limits of how (phenomenal) consciousness can be transformed, extended, enabled or diminished by our (smart) technologies which may also provide a possible limit for our cyborg-concept.

The (Science-Fiction) Concept of Cyborgs

When we talk about cyborgs in everyday life, most of us may think about the Borg Queen from *Star Trek* or the Major character from *Ghost in the Shell* (or the like). It seems,

however, obvious that we are not turning into the Borg any time soon and technology is not advanced enough to transplant a human brain into a humanoid robot, but this does not mean we are not on a road to humanity's technological enhancement. According to futurism.com, cyborgs today look closer to, for instance, Neil Harbisson, a cyborg activist who is enhanced with an antenna on the back of his skull that allows him to "hear" colors. Another example is Zac Vawter, who is a software engineer and received the first mind-controlled bionic limb after his leg was amputated above his knee in 2012. This begs the question of how we should think about cyborgs. In the next sections of this paper, I will investigate this issue starting out by framing the matter.

The Mind-Technology Problem

So far, we could say that any generic idea of a cyborg includes somehow the original conceptual notion of Manfred Clynes and Nathan Kline, i.e., the idea of some entity with biological and technological parts (Clynes and Kline, 1995). But as we have seen in the last section the actual instantiation of such an understanding is rather broad. One strategy to make this problem more tangible is first to set up a reference frame and then to limit the scope to one specific phenomenon, in this case (phenomenal) consciousness.

The context—which I will set up in this section—I have in mind is the so called Mind-Technology Problem (Clowes, Gärtner and Hipólito, 2021; Fuller, 2021). This problem is born out of the more traditional Mind-Body Problem (Descartes, 1991, 1998). The Mind-Body Problem stems from the dualistic idea that, on the one hand, there is the physical body and, on the other hand, there is the mind which is essentially different form the body. The Mind-Body Problem, as we know it, entails a multitude of issues. For instance, there is an epistemological question of why we supposedly have privileged or secure knowledge about our minds and why knowledge about the world is only contingent. Another issue, which is of metaphysical character, concerns the question of what the nature of the mind is (since it is essentially different from the physical body).

The Mind-Technology Problem succeeds the Mind-Body Problem. Here the question is not how the mind and the body relate, but how the mind and the ever more available smart technologies are linked. Consequently, the Mind-Technology Problem claims that we need to re-conceptualize the nature of mind and its relationship to technological artifacts by asking ourselves how the mind is transformed, extended, enabled or diminished by our advancing (smart) technologies. Essential questions include: What characteristics of the mind might be enabled and which might be diminished by smart technologies? Where does the mind stop and where does technology begin? Basically, the Mind-Technology Problem refers to a constellation of problems we need to answer when we want to find out what the limits of the mind are and how smart technologies bear on these limits (Clowes, Gärtner, Hipólito, 2021).

Phenomenal Consciousness

Now that I have set up the context in which we want to discuss the concept of a cyborg, let me briefly introduce the particular phenomenon of the mind—i.e., phenomenal consciousness—I will consider here. Phenomenal consciousness refers according to the famous article "What it is like to be a bat?" by Thomas Nagel to the following idea:

> Conscious experience is a widespread phenomenon. (...) No doubt it occurs in countless forms totally unimaginable to us, on other planets in other solar systems throughout the universe. But no matter how the form may vary, the fact that an organism has conscious experience *at all* means, basically, that there is something it is like to *be* that organism. There may be further implications about the form of the experience; there may even (though I doubt it) be implications about the behavior of the organism. But fundamentally an organism has conscious mental states if and only if there is something that it is to *be* that organism—something it is like *for* the organism.
>
> (Nagel, 1974, p. 436)

So, basically phenomenal consciousness refers to the type of consciousness we entertain when we are, for instance, enjoying a walk on the beach or a sip of wine. It is the qualitative feel of undergoing a specific experience.

In my view, this is a particular well-suited phenomenon to think about what a cyborg is. One important indication can be found in Susan Schneider's 2016 TEDx talk "Can a Robot Feel?". In the context of her presentation, Schneider asks us to imagine what would happen if humanity and AI merge, and, in the process, the new hybrid entity would lose phenomenal consciousness. In a nutshell, her question concerns the issue of whether or not we, as humans, should aspire for this outcome. Even though the question is normative—i.e., what the value of phenomenal consciousness is—it hints at an important insight about the mind. How essential do we think phenomenal consciousness is for the nature of the mind in general and in complex carbon-based life forms—including humans—in particular? This is obviously especially difficult to answer when we talk about a cyborg-concept.

In the context of the Mind-Technology Problem, we should ponder how much of phenomenal consciousness can be transformed, extended, enabled or even diminished by our smart technologies. If phenomenal consciousness, on the one hand, is something we want to be preserved, then, at least, we cannot let it be diminished to the point of its non-existence. On the other hand, if we think that phenomenal consciousness is just a contingent property of the mind and it is not worth saving, then we could simply get rid of it.

Are Their Limits to Being a Cyborg?

What should we do? In my view, this is rather an eccentric question. We know that there are various concepts and types of consciousness that could be taken into account—for instance consciousness as a monitor or conceptual self-consciousness (Van Gulick, 2021). Also, we can imagine that some of these types of consciousness could theoretically be instantiated by purely computational systems. However, does this circumstance meet the criterion of being a cyborg? We should keep in mind that these kinds of consciousness could also theoretically be instantiated by any robot equipped with sufficient computational resources. So, do we want to allow any robot to become a cyborg by, say, adding a biological limb to its body?

In my view, this is putting the cart before the horse. As far as I can see, cases such as Neil Harbisson and Zac Vawter have one thing in common: they start with a human being and only then become about enhancing this human with (smart) technologies. Of course, enhancement can mean many things. For instance, we can imagine creating incredible new experiences such as hearing colors or using a bionic leg. However, we usually do not imagine losing phenomenal experiences altogether. In my view, this means that if phenomenal consciousness ceases to exist due to technological enhancements—may it be through brain implants, or something else—then we need to ask ourselves whether or not we have come to the limits of transforming, extending, enabling and especially diminishing consciousness, i.e., something that may be essential to complex carbon-based minds. As a consequence, we need to ask ourselves whether or not such a limit of transforming, extending, enabling and particularly diminishing (phenomenal) consciousness also results in a limit of what we can call a cyborg. This means, we need to ask ourselves whether or not cyborgs should have phenomenal consciousness.

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A New Type of Person? A Schelerian Perspective on the Cyborg

Susan Gottlöber

Introduction

In philosophy the question if and how far a philosophy from the past can be used to address contemporary issues is a long standing one; often alongside the question of how insights from other sciences should be taken into account when discussing the so-called perennial questions in philosophy. An example of such a question is human nature and who we are as human beings which concerned the thinkers in early 20th century philosophical anthropology, among them the German philosopher Max Scheler (1874–1928), who, in his own words, was more interested in this question than any other since the first awakening of his philosophical consciousness (Scheler, 2005a, p. 9). Scheler, whom Martin Heidegger called at the time of his death "the strongest philosophical power in contemporary Germany, nay, in contemporary Europe—in fact, in all of present-day philosophy" (Heidegger, 1984, pp. 50–52) developed in his philosophical anthropology as well as in his personalism, ideas that challenged simultaneously the traditional religious interpretations or rationalist perspectives, as well as the newly emerging Darwinian paradigm, going, as he did so often, along a third way between two extremes, taking into account, just like Plessner and later Gehlen, insights from contemporary biology, psychology, etc. (Fischer, 2009).

The following brief considerations are part of a larger investigation, namely to investigate the value, potential, and limitations of Scheler's philosophy, especially with regard to his philosophical anthropology, for contemporary philosophical questions related to the human being and human flourishing. In this paper we will focus on analysing and evaluating the potential and the limits of using Scheler's phenomenologically-inspired philosophical anthropology and his personalism as a framework for developing new perspectives on the (human) cyborg.

Starting first of all with a basic working definition of the cyborg, based on Andy Clark's *Natural-Born Cyborg*, we will then, secondly, outline and explain the key features of Scheler's philosophical anthropology and his personalism as simultaneously philosophical and interdisciplinary approaches. Here the focus will be on two so-called primordial phenomena (*Urphänomene*): life (*Leben*) and spirit (*Geist*); some of the consequences Scheler draws with regard to what it means to be human and being a person, including the ideas of becoming, or the role of reality as resistance vis à vis self-consciousness; and,

finally, Scheler's understanding of the tool. Thirdly, we will apply these features to some current notions of the cyborg and establish how, using Scheler's own ideas, the cyborg can be understood to have both features belonging to the "*Wesensidee Mensch*" and, more importantly, to be a person. We will conclude with evaluating the potential and limits of applying Scheler's approach with a special focus on Scheler's concepts of *Geist* and becoming.

The Cyborg: A Basic Working Definition

To begin with, we will operate with the very basic understanding of the cyborg as developed by Clark in *Natural-Born Cyborg* as our reference point to test the applicability of Scheler's concept. Grounded in the human being as tool-maker, the cyborg here is defined as a (human) living being whose physical abilities are extended beyond biological limitations by using technological elements of different kinds:[1]

> The human mind, if it is to be the physical organ of human reason, simply cannot be seen as bound and restricted by the biological skinbag. In fact, it has never been thus restricted and bound, at least not since the first meaningful words were uttered on some ancestral plain.
>
> (Clark, 2003, p. 4)

Interestingly, for a Schelerian, this description would not be so much, first and foremost, a description of the cyborg (which he could not have known), but, as we will see, a description of the human being as the essential term (*Wesensbegriff*). Of course, Scheler would not have been able to envision the potential of altering our biological make-up all the way as far as directing our own evolution. Yet, the ability of the spirit to say "no" and present the human being with the way out of their biological limitations is clear in Scheler's thought.

Key Ideas to Be Considered: Scheler's Philosophical Anthropology, His Personalism, and His Concept of the Tool

In Scheler's famous work *Man's Place in the Cosmos* from 1928 he observes that we have two substantially different understandings when using the term "human being": as *Homo naturalis* the term human is used for a subspecies of mammals and vertebrae. In other words, here we talk about the human being as a life form, standing in line with and descended from, other life forms. However, we also use the term human to be in opposition to other life forms, and especially animals: here we are using the term as an essential term (*Wesensbegriff*)—which is the one he is interested in (Scheler, 2005a, pp. 11–23). Famously, for Scheler the human being manifests two primordial phenomena (*Urphänomene*, a term

[1] There is no reason why we should not consider that other life forms can be transformed into cyborgs as well, however, from the current point of knowledge that would still need to be initiated by human beings.

borrowed from Goethe): Life and spirit.[2] For Scheler, primordial phenomena are those phenomena that can *never* be observed but only be perceived ("das Anschauliche, das *niemals* beobachtet, sondern nur erschaut werden kann") (Scheler, 1979, f. 87). For the human being this intertwining takes the following form: as a life form humans share having life drives with other life forms, and share with higher developed animal abilities such as associative memory, and even practical intelligence—we are not so different! It is this part of being human that can be explained, for Scheler, through descendence theory. As a life form, however, we present for Scheler a "cul de sac"—no further substantial developments are to be expected. Important for our question here are two points: it is life that gives the spirit energy, and it is the resistance given to the life-drives that not only "gives" life-forms reality, but in that experience of resistance we have the necessary foundation of (self)-consciousness—no experience of resistance, no consciousness.

If the human being as a life-form is a cul de sac, then spirit is the way out: while we cannot observe and objectify the spirit (like the person), we can phenomenologically observe it: beings with spirit have the ability to objectify and to perform acts of abstraction, have a unified time and space, can say "no" to reality, have a world rather than just an environment, and perform the act of ideation (Scheler, 2005a, f. 40). Both life and spirit need to be present for a being to have self-consciousness.

Scheler's personalism rests on these assumptions from his philosophical anthropology as well as his value ethics: like the spirit the person cannot be objectified but exists only in and through their acts as the "concrete unity of all potential acts" (Scheler, 2009, p. 50). Scheler is very clear: the (human) person is not a substance but (and this is developed especially in the later Scheler and some of his posthumous published notes) is constant self-becoming—a very Nietzschean idea that Scheler takes up again.[3] Thus, any being that can experience reality through resistance and is able to perform spiritual acts, is to be considered a person.

An additional, though less developed feature seems essential when addressing the question of the cyborg from a Schelerian perspective: the tool, also considered by Scheler to be a primordial phenomenon, and, like religion, art, history, etc., belonging to the monopolies of the human being (Scheler, 1997, p. 19). Unlike most thinkers of his time, Scheler did not follow the popular idea that tools are extensions of organs. Rather, they only appear when an organic adaptation has become impossible due to a type or essence

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[2] The translation of *Geist* as spirit is somewhat unfortunate as spirit has more religious and esoteric connotations than *Geist*. Scheler chooses *Geist* deliberately as he sees it as a more comprehensive term than *nous* or *intellectus*, encompassing not just reason but also acts of kindness, love, spiritual awe, despair, etc. (Scheler, 2005a, f. 32).

[3] While in Scheler's lifetime these descriptions of spirit and the person applied only to human beings, today we could argue that we see these features displayed in a number of other animals as well. Scheler already had challenged the longstanding line drawn between human beings and other animals on accounts of intelligence, but reestablished it with the ability to perform spiritual (*geistige*) acts. Today, following Scheler's logic, we could use Scheler's theory to argue for non-human personhood.

(*Wesen*) having become permanently set which leads to a vital deficit in the ability to realize certain values (Scheler, 2009, p. 291).

Now, the human mind, according to Scheler, has the ability to combine symbols (*Zeichen*) and matter to create machines. This *ability* (although not the tool itself) is an extension not of the *spirit* but of life as it is life-serving. Yet, the tools themselves are already a consequence of a life deficit with regard to value realization, which is being addressed with the tool and its use (Scheler, 2009, pp. 289–292). We can therefore assume that the more abstract these inventions become, the bigger role the spirit seems to play in order to enable value realization beyond the biological limitations, be they imposed by anything that hinders, for example, a human being to flourish in its current environment, or any possible or future environment.[4]

The Cyborg and Scheler's Person: Compatible?

As we have already indicated above, Scheler's concepts may well be extended beyond the human species.[5] The question now arises, taking all these considerations into account, whether the cyborg as defined earlier falls outside of Scheler's definition of the human being as *Wesensbegriff* and how compatible would they be with Scheler's concept of the (human) person? Following our brief considerations above, the following key features need to be considered:

• Self-consciousness can be assumed in all beings to whom reality is given through resistance against their life-drives and who display features of the spirit.

• That a being is able to accommodate spirit depends on the material conditions—Scheler does *not* specify what these conditions are, but hints that at some stage in human development this point has been achieved.

• Transcending (our) biological limitations is a feature of a being that has spirit.

• Scheler's later philosophy especially takes the perspective of a "progressive self-salvation and self-deification of mankind" (Henckmann, 1998, p. 148). Scheler focuses on the human being as becoming and as self-*deificatio* (*Menschwerdung=Gottwerdung*)[6] with the goal of the so-called *All-Mensch*/all-man who shares in all parts of being and a human spirit that has

[4] Here we may think both of exploring new environments, either originally hostile to human existence or experiencing new, formerly not accessible parts of it, or, as today, fast changing newly created environments, such as the digital one. In this way, a large number of human inventions fall under this category. What stood out for me where two items mentioned by Steve Mann that have accompanied humans for a long time: clothes and boats.

[5] We can go even further here: while the starting point, is, of course, from an existential point of view, human, applying Fischer's theory could mean it may not stay like that: we may well be able to abstract from our own starting point (to bracket existence as Scheler would say) and see humans as well as other beings participating in and individuating these primordial phenomena together with other living beings, albeit potentially in very different ways. The self-consciousness of an elephant (or an AI for that matter) may be self-consciousness but not a human one. However, this cannot be explored any further at this stage.

[6] One has to remember here, of course, that Scheler at this stage did not accept a Christian personal God but talks in general of the ground of Being (*Grund der Dinge* or *Seinsgrund*) as the highest metaphysical principle.

strengthened itself enough to bear the not-completed-God that will be completed through the human being themselves (Scheler, 2005b, p. 104). And while these considerations have a strong metaphysical connotation the goal of an overall strengthening of the human being is clear.

• Finally, life and spirit interact in the (human) person with life giving energy to the spirit and the latter giving direction to the former—a point to which we will return in the conclusion.

The definition of the cyborg as presented in part one of our considerations does not contradict any of these key characteristics. Quite the opposite: as already hinted above, the definition of the cyborg fits neatly within what Scheler considers to be the essential characteristics of what it means to be both human and a person.

Conclusions: Main Philosophical Limitations and Final Verdict

Traditionally, one of the main criticisms of Scheler's philosophical anthropology, and especially his concept of the spirit, was aimed at the metaphysical foundation we briefly discussed above. Yet, our argument (and Scheler's philosophical anthropology and personalism) function also without this specific metaphysical grounding (namely the theory of the primordial phenomena grounded in the "ground of being") as both spirit (and life) and the person are identified in a *phenomenological* manner which needs to be separated from its cause (metaphysical or otherwise).

In addition, the relationship between intelligence, especially with regard to its more theoretical aspects, and the spirit are not clarified, even though Scheler emphasizes the distinction repeatedly. That this relationship is not clear then has a knock-on effect concerning questions such as tool creation. However, what we can say, I think, is that we have a fusion between intellectual and spiritual achievements (e.g., scientific) in terms of technology which is already apparent in the accomplishments and visionary drawings of, for instance, Leonardo de Vinci, but much more pronounced and widespread in the age of information technology.

Despite this conceptual lack of clarity we can conclude that, for Scheler, the human cyborg would fulfill the characteristics of a human being and a person as defined in his *Wesensbegriff* and the human person. The cyborg as long as they are alive and display features of spirit would not even be a new type of person—they would just be (human) persons. Furthermore, there is no evidence to suggest that the difference between the early human use of tools up until relatively recently and the technology more intimately merged with the human being would be of such a qualitative nature that it would merit an entirely new approach. Rather, we can see (and Scheler would too is my suggestion) a continuous line of development.

Interestingly, most aspects of the cyborg (in terms of human enhancement) would fall under Scheler's definition of tool. Thus, most, if not all "enhancement" concerns the

aspect of life but not of the spirit, i.e., the human being as *homo naturalis*, even if we take into account the objection that the relationship between intelligence and spirit is not quite clear. Therefore, enhancement would not really touch the spiritual core of the person at all, other than being partly dependent on scientific advances (in the interaction of intelligence and spirit). For Scheler one of the exemplars (*Vorbild*) in his value theory concerning the values of civilization, the engineer, here becomes the key player with regard to the enhancement of certain aspects of human nature.[7] However, we may assume that since the more advanced technology requires more of the ability of the spirit in terms of imagination and abstraction, the greater the role of the spirit. As long as the use of tools or more advanced technology, from boats to pace-makers and beyond, enables the enhancement of both life and spirit, it should be embraced according to Scheler.

The last point regarding this question leads us back deep into one final fascinating aspect of Scheler's philosophical anthropology: the controversial assumption that spirit without the energy of the life-drives is powerless while life without spirit lacks direction. For Scheler, as we have seen above, one goal of all human development is the *Verlebendigung des Geistes*: vivifying the spirit. Or to rephrase it: the simultaneous spiritualization of the drives and the empowerment/vivification of the spirit are the goals of all finite being, self-deification and the all-man. It is here, that we can see that Scheler's theory also entails the potential for a critical evaluation, or even correction of certain contemporary developments concerning the cyborg or transhumanism. While engineers have a crucial role to play, they should not take the lead when guiding the overall development of mankind—this is the task of the metaphysician, or at least an all-man well versed in metaphysical questions and a comprehensive understanding of the complexities regarding human nature, value ethics etc. Otherwise, there is the danger of self-idolatry: "[T]he human being *is* not an artwork, *ought* not to be a work of art" (Scheler, 2005b, p. 104). Rather, the goal is attaining one's true self which is outside the self and reaches continuously beyond the current state of existence and its limitations. Thus, all means of enhancing the powers and the self have as their final goal reaching for something greater, i.e., beyond the individual self and even humanity—leading to a true act-*deificatio* which is, at the same time, the deification of the person.

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[7] David O'Brien in his current research (see also his contribution here) speaks of the human being as having become an engineering problem.

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Ethical Aspects of Human Cyborgization

Ivana Greguric

Introduction

When we talk about the ethical aspects of the cyborgization of the human species, we must start from the philosophical assumption that enhanced cyborgs, like other cybernetic transhuman and posthuman beings, set up new cybernetic ontologies and anthropologies. Cybernetic science and technology ontologize the entire biological life of nature and society. Man and the world are no longer ontologically and ethically grounded in a transcendent battle, God or in a self-conscious subject. Substance, the subject of our time, has become an independent scientific-technical mind whose essence is the "will to power" and the mode of existence is the "eternal return of the equal." Man still co-operates in this will to power as an interpreter of the scientific-technical mind, and this on the one hand makes him powerful but also powerless because he is no longer a subject but an object of the self-serving movement of science and technology.

From Technology as Human Extension Towards Human Cyborgization

For Marshall McLuhan every technology is designed as human extensions: "in the electrical age, when our central nervous system expanded technologically and connected us to the entire human race and united the entire human race with us, we inevitably participate, fully, in the aftermath of each of his actions" (McLuhan, 2008, p. 10). According to McLuhan, "through the media (technology – I.G.) we are hypnotized (*Narcissus Narcosis*)" which means that "we are the products or effects of the media (technology – I.G.)" (Levinson, 2001, p. 193). The myth of Narcissus wants to show us that by uncritically accepting technology, it puts us in the role of narcissist in the role of numbness and state of narcosis: "Young Narcissus exchanged his own reflection in the water for someone else's reflection. It was his expansion, by the mirror, that numbed his observations" with the consequence that he drowned (Levinson, 2001, p. 111).

Cybernetics sees man as a cybernetic system that can be programmed and controlled, damaged parts can be changed so that the system can continue to function. When a part of a technical device breaks down it can be replaced with the same new part and the system will work like a new. Systematic observation of the human organism in the spirit of

cybernetic understanding of the replacement of organs or limbs in the human body belongs to the maintenance of the condition, for example in case of—disease, we can return to the basic healthy state. But why do we repair and reshape a healthy human body and functions? It is about setting up a new cybernetic reality, which some authors in the spirit of the transhumanist agenda call scientific—technical evolution that will replace the slow Darwinian evolution.

According to transhumanists everyone has personal choice to improve their capabilities. This includes use of techniques that may be developed to assist memory, concentration, and mental energy; life extension therapies; reproductive choice technologies; cryonics procedures; and other possible human modification and enhancement technologies. Transhumanist perspective "thinks of the body as an original prosthesis that we will all be able to manage, so that supplementing or replacing the body with other prostheses is a continuation of a process that began before we were born" (Hayles, 1999, p. 3). Our generations will experience the emergence of new technical forms »we will embrace more and more dramatic variations body shapes and effective cognitive profiles. People who will live in the next century it will be much more heterogeneous, with much more physical and cognitive variation than people from the past because we will deliberately launch a new Cambrian explosion of body and mind" (Hayles, 1999, p. 3).

Cyborg Taxonomy—Division and Category of Cyborgs

The four techniques of cyborgs allow for a more general division of cyborgs, into biomedical cyborgs (Homo Cyborg), digital cyborgs (Cyber Cyborg) and robotic cyborgs (Robo Cyborg) (Greguric, 2021, pp. 71–105). Based on the legality of systematic theory, a division into material cyborgs and information cyborgs is possible. An example of material cyborgization is the installation of an artificial hip, and by inserting implant sensor it becomes an information cyborg (Greguric, Čatić, 2012, pp. 60–67, 112). Within the context, we divide cyborgs according to their structural and functional role.

Type of Cyborgs According to Structure

Depending on the structure, cyborgization can be applied externally and internally.

External Structure

This category includes the reconstruction and improvement of the body with the help of new technical extensions such as adding new materials, different context of action (e.g., virtual reality with haptic interfaces), creating new subjects (virtual alter ego Ramona), evolving new agents (semi-automatically robots) in the real world etc. According to the external structure, cyborgs are divided into:

Bio-medical cyborg—bionic implants added to the body to replace a missing or lost body parts lost due to injury, disease or congenital defect—e.g., artificial limbs or prostheses such as joint replacement, robotic orthoses to support people with mobility problems (restoring ambulatory capabilities of paraplegic patients).
Cyber cyborg—external body change with built-in and advanced technologies, wearable human-robot interface e.g., exoskeleton (Greek *ἐξωσκελετός*) to increase physical strength, speed and endurance or increasing human performance with personal technologies e.g., wearable computing.
Robo cyborg—embodied artificial intelligence (AI) in humanoid's complex physical or virtual embodiment that possess enhanced morphologies—physical characteristics as well as sensory and motor apparatus.

Internal Structure
This category includes incorporation of technology into the body, adding new organs (new senses and nerve endings), new skills (new use of existing senses and nerve endings) and implantable microdevices built in to improve the human abilities. According to the internal structure, cyborgs are divided into two categories:
Biomedical cyborg—refers to electronic or mechatronic parts (bionic implants) implanted inside the body that restore physical functionality and normalize bodily functions lost due illness, injury or disability—e.g., pacemakers or cognitive assistive devices.
Cyber cyborg—refers to the implantation of additional nerve pathways in the human body to transmit new sensations —e.g., ultrasound signals and the achievement of new senses: sight, hearing, touch, taste, smell; invasive sensory and improvement that will enable the achievement of resistance to disease and aging, control over one's own desires, moods, increased ability to enjoy, love, temptation of new states that current human brains cannot access. (The Transhumanist FAQ)

Types of Cyborgs According to Function

Depending on the function, cyborgization can be used to maintain or improve mental and physical strength.

Mental Function
This category includes using Nano-Bio-Info-Cognitive technology (NBIC) for enhancing cognitive capabilities, improving human-machine interfaces. According to the mental function, cyborgs are divided into:
Biomedical cyborg—involves a non-invasive approach to brain activity using an external brain-computer interface (BCI) that helps paralyzed patients communicate and manage the

environment through brain integration and peripheral control.
Cyber cyborg—includes invasive application of techniques in the central nervous system that improve attention, concentration, and information processing in executive functions such as reasoning and decision-making; cognitive enhancement and embodiment of superhuman traits or abilities—improving memory, imagination, cognition—e.g., memory chip.
Robo cyborg—involves the "upload" or "transfer" of human brain functions into the artificially intelligent systems or emulating human mind in a digital medium (mind uploading) e.g., 2045 Initiative.

Physical Function
According to the bodily function, cyborgs are divided into:
Bio-medical cyborg—includes health restoration such as tissue engineering and regenerative medicine to restore and maintain damaged tissues or whole organs e.g., implantation of artificial organs, 3D printed biomedical implants.
Cyber cyborg—represents a future projection of a fully designed extended performance body with a meta-brain— e.g., replacement organs, smart skin, a device for correcting defects in the functioning of the body etc. (Vita-More, 2005).

Cyborg Code of Ethics

The ethical framework refers to four principles that set Beauchamp and Childress: harmlessness: (do not harm), charity (do good), autonomy (respect for personality, holiness of personal choice) and justice (equal access and application) (Beauchamp, Childress, 2001). Thinking about the scientific and technical future of humanity in terms of enhancing human capabilities through cyborgization procedures includes some of the potential principles of Cyborg Ethics (Greguric, 2021, pp. 300–304, 311–312).

The Principle of Thinking Cyborgization Boundaries
Questioning ethical, medical, social and philosophical *pro et contra* arguments for certain technological progress; to draw a line between restorative and normalizing procedures and enhancing and reshaping procedures. It is not equal to substitute bodily functions (artificial hip) and interfere the mental functions. This principle implies the philosophical discussion about the essence of the enhancement and its manifestations in our epoch. Implants and prosthesis that improve should be

> distinguished between effects that are therapeutic, enhancement, and transhuman. A therapeutic effect would be one that repairs a body to more or less match its state previous to an illness. An enhancement effect would be one that would allow for an increase in natural human potential within the typical human realm.
>
> (Triviño, 2013a, p. 19)

The Principle of Cyborgization Purpose

Researching conceptual questions and ethical context of using human enhancement technologies; to determine the purpose that wants to be achieved by inserting the implant into the human body. It is ethically questionable to create a system which uses reshaping of human beings to create more perfect beings with superhuman possibilities and artificially created intelligent beings. As Trivino points out, extensive use of physical performance enhancement techniques may lead to a situation in which "we are incapable of identifying the original 'I' whose performance we want to improve" (as cited in Schneider, 2000).

The Principle of Cyborgization Usage and Safety

To test individual biological boundaries of endurance when substituting with technical improvements, and analyzing the dangers of implementations of the ubiquitous neuro-, bio and nanotechnologies: "1. when there is harm to others; 2. when there is insufficient knowledge about the effects it would have on health" (Triviño, 2013b, p. 120). An additional aspect is issue of responsibility due technology failure or unsuitable participant. There is a vast difference between the need to substitute a deficient organ or organ system function, and upgrading the function of a hitherto normally functioning organism. A line should be drawn between the ethics for the preservation of life, autonomy and the ethics of enhancement which tries to justify the need for man's enhancement and reshaping.

The Principle of Cyborgization Law Regulation

Analyzing particular cases of enhanced individuals, making the decision to ethically preserve life and possibilities of humane existence. The real question is: Does the implanting prothesis risk their health? Who is owner of data that enhancement technologies use and collect? Encouraging the work of multidisciplinary teams researchers and making comparisons between bioethical restrictions by comparing the harm, coercion and fairness consequences to the problem of human enhancement. It is necessary to establish laws that would legally and ethically control the boundaries and further implementation usage, and make decisions which would ensure the safety of the individual as a natural human being, thus eliminating potential danger from other decision centers, such as global corporation interest groups.

Principle of Cyborgization Implications for Human and Society

Multidisciplinary scientific research and discussion of the ethical context of the application of neuro - bio - nano techniques in the aspects of improving human beings is deeply divided by different traditional, ideological, economic, and political interests in society.

a) Inequality, unfairness and social and existential concern—ranking people as inferior (non enhanced) and superior (enhanced).

b) Authenticity of human nature—does some enhancement go against nature and undermine people's dignity. Some enhancement techniques related to neural activity raise important ethical problems associated with free will, privacy, liability (ability to "read" or otherwise "assess" someone's thoughts, emotions, states or attitudes, potentially affecting people's moral or social behavior) (Chan, Harris, 2011).

Concluding Remarks

Science and technology as extensions of the human senses must remain permanently the means of human purposes. Their role in healing, preventing disease and taking care of life in historical reality is irreplaceable. However, the complete cyborgization of interpersonal relationships, nature and everything that is historical, and especially the enhancement of healthy human beings arise from the self-serving essence of the technique. Therefore, philosophy and ethics, as well as humanity as a whole, face the task of adopting thoughtful ethical principles about the limits of transhuman human enhancement and the existence of posthuman beings. From an ethical standpoint, cyborgs are only the first step of transhumanism towards posthuman robotic beings and man-made artificial intelligence. The principles must start from the meaningful value of life, which is older than reversible scientific-technical projections of artificial man.

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Cyborg Bodies in ASMR[1]

Joanna Łapińska

ASMR (Autonomous Sensory Meridian Response) is a cultural and audio-visual phenomenon that has gained a lot of attention in recent years. The authors of ASMR videos published on YouTube create content for the constantly growing ASMR community with the goal of inducing a pleasurable tingling sensation in viewer-listeners' scalp, head, neck, and spine areas using so-called "triggers" (e.g., whispering, soft hand movements, tapping and scratching different objects, crinkling paper or plastic). This fleeting sensation of "brain tingles" is supposed to "bring mindful relaxation to our busy modern world" (Richard, 2018, p. 9); it is expected to induce deep tranquility in the viewer-listener's body and mind, de-stress them, reduce sleeplessness and insomnia, minimize depression, and improve overall mood.

The phenomenon of ASMR seems to propose in some ways a worldview that treasures open structures and viable connections established between different bodies: the body of the artist visible on the screen, the body of the viewer-listener sitting in front of their technical device, and the bodies of multiple objects used during the performance. By emphasizing human-non-human bodily relations involved in this multisensory experience, ASMR invites the researcher to examine them from the perspective of the theory of cyborg. The metaphorical figure of cyborg, best known from *A Cyborg Manifesto* authored by Donna Haraway (1991), indicates that the ability to establish viable connections and strategic coalitions and to create open structures and effective unions at a given moment is more vital than the traditionally defined "identity." Harawayian kind of cyborg carries the emblematic potential of "the embodiment of mobility" (Jeśman, 2011, p. 116) and of "morphological freedom" (More, 1993, p. 17); hybridity becomes a way of its everyday functioning.

Can the body of ASMR viewer-listener who feels a tingling sensation evoked by the artist exploiting numerous stimulating methods and gadgets and transferred with the help of technological apparatuses (microphones, cameras, headphones...) be called a dispersed, cyborg body? If so, what could this indicate?

The audio-visual materials published on one of the most popular ASMR YouTube channels called "asmr zeitgeist" are an excellent example of the depiction of cyborgian

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diffused corporality. With over two million subscribers and one hundred eighty-five videos, the channel constitutes an interesting source for an ASMR researcher. In her essay, Emma Leigh Waldron (2017) argues that production, circulation and consumption of ASMR videos produce new affective modalities that challenge the notions about the traditional sexuality and pleasure. In addition, she implies that ASMR practices support intimate incorporation of viewer-listener's body into corporal responsiveness cycle with the artist's body: their voice, face and/or bodily gestures. This cycle includes, of course, non-human actors: technological devices and performative props whose animation supports the creation of intimate connections between actors. In the video *ASMR NEXT LEVEL for Brain Melting Tingles and Deep Sleep* published on the "asmr zeitgeist" channel, Michael, the channel's creator, does not refrain from experimenting with the new technologies like binaural and multi-speaker microphones. They are shaped like human ears and positioned arbitrarily in various places, forming a kind of cyborg entity (see Fig. 1).

Figure 1. Multiplied ears on the tabletop (Source: asmr zeitgeist, 2020).

The multiplied microphone ears pick up the sounds produced by Michael's rubber-gloved hands and deliver them to the viewer-listener causing a tingling sensation. In a way, I, the viewer-listener, am the cyborg here; it is my ears on the tabletop that are being caressed by the artist's hands.

In the same video, we can observe the white-blue luminescent mannequin head with ridged pipes extending out from the places where the ears should be (see Fig. 2). Michael gently moves the pipes around to create a pleasant sensation for the viewer-listeners. Thus, maybe this is also a cyborg body with the potential viewer-listener being right there: a ghost in a glowing shell.

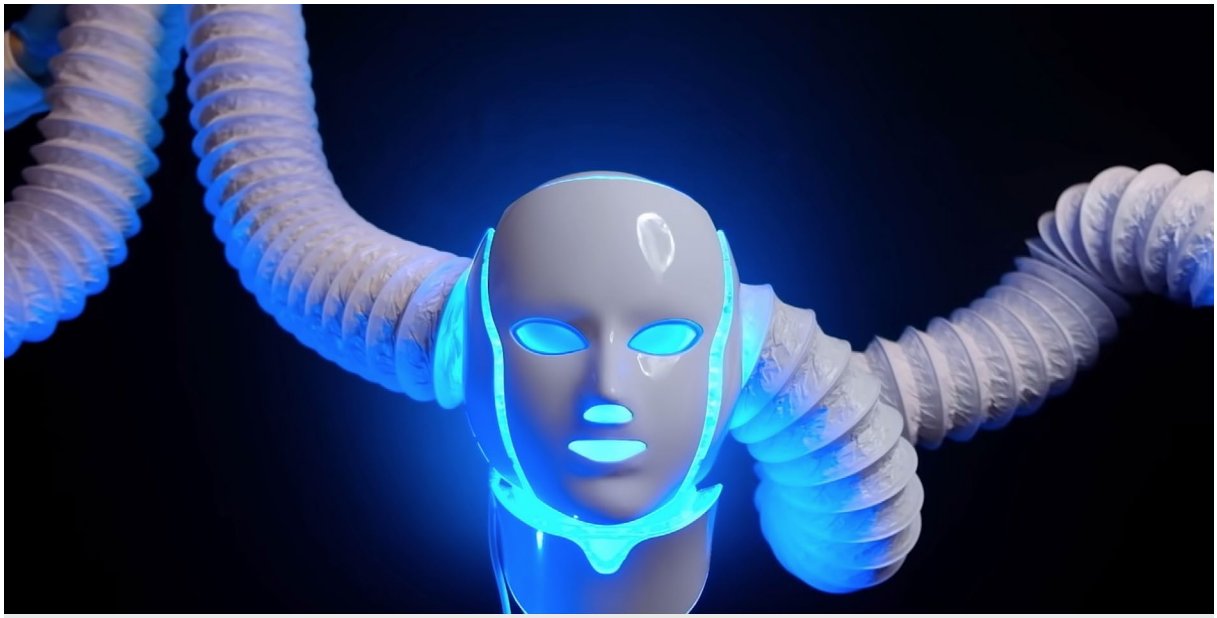

Figure 2. Mannequin head with pipe ears (Source: asmr zeitgeist, 2020).

Another aspect of the cyborgization of experience in ASMR is the animation of non-human objects in Michael's videos. The protagonist of many of the films published on the "asmr zeitgeist" channel is a microphone named Frank, whose cartoonish facial expressions mirror the viewer-listener's desired reaction to the triggers used during the session. Naturally, most often Frank looks heavenly relaxed (see Fig. 3).

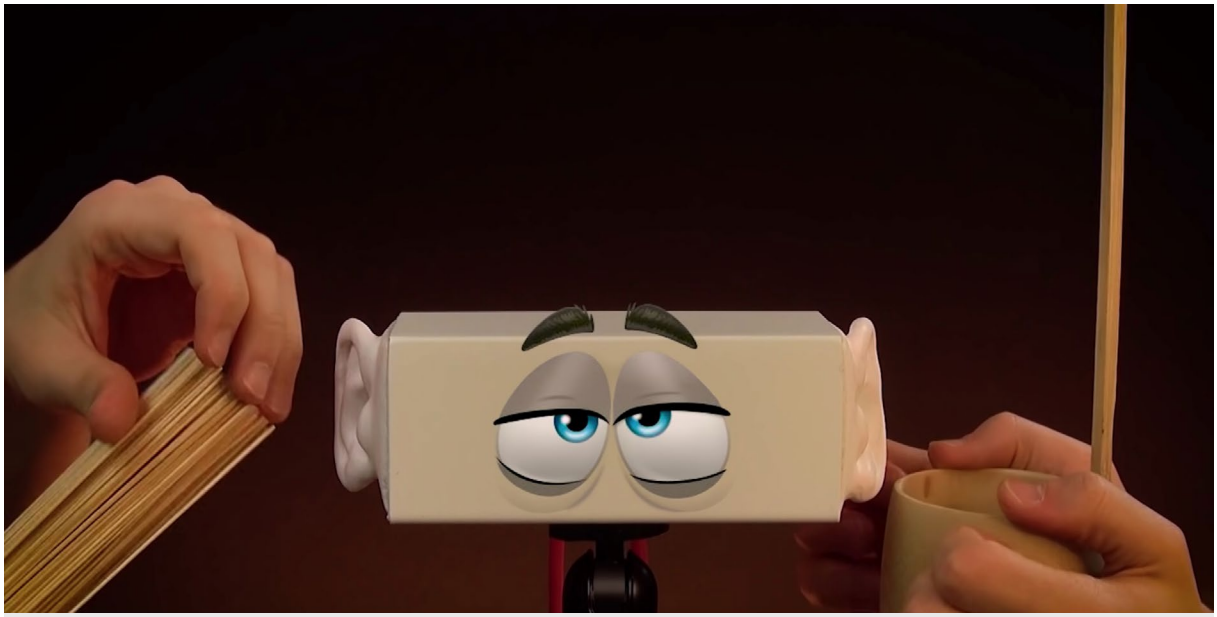

Figure 3. Microphone Frank (Source: asmr zeitgeist, 2018).

In this case, it is a non-human actor on the screen who represents the viewer-listener's mood, pointing to another layer of the cyborgian experience. What is central here is a human-non-human union tied at a given moment (that essentially may last only as

long as a tingling sensation felt in the head...) or, in other words, an effective entanglement of human and non-human bodies. I, as the person sitting in front of the screen, *am* Frank who feels the touch of various objects on the skin of his ears. I *am* a part of this intimate, ephemeral assemblage. My boundaries are blurred and my body is dispersed.

I am a cyborg.

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Turing Test 2.0: Attribution of Moral Status and Personhood to Humans, Animals, Cyborgs, Social Robots, and Algorithms

Aleksandra Łukaszewicz, Paweł Fortuna

We propose to analyse the recognition of various non-human, differently embodied agents as moral subjects through a reinvention of the Turing test. Therefore, we present the effect of the study we have conducted on the 322 of Polish citizens to define the perception of the moral status of variously embodied agents—not to decide about who is and who is not a moral agent or a person, but to find out who people recognize as such. The different agents considered in our study are a human person, a cyborg person, a fembot, a social robot, an animal, and an algorithm. We asked respondents to relate these characters with 12 attributes (curiosity, creativity, bravery, persistence, kindness, love, teamwork, leadership, prudence, self-control, gratitude, appreciation of beauty) relating to 6 virtues (wisdom and knowledge, courage, humanity, justice, temperance, transcendence) listed in positive psychology and 2 personal judgments related to the moral agent (*If both characters caused the death of a person, which of them would be more punishable?*) and the moral patient (*If someone forced you to hurt one of these characters, which would be more difficult for you to harm and would it be more painful for you?*). The effects of the study demonstrate the other creature recognized as moral agent does not need to be a "natural" *Homo sapiens*; but can be also an upgraded *Homo sapiens* or a cyborg. People attribute moral status to various agents, human and non-human, and attribution of moral status is not binary: it is gradable, fluid, and transitional, varying on the scale of agency and experience, defining dimensions of mind perception.

Then, if moral status is gradable, contingent, and transitional, it can be acquired and lost, so we should ask what is the threshold for legal recognition of an entity as a person and a member of society? Should this status be restricted to "humans" in the biological sense of *Homo sapiens*? Any criteria for recognition of a moral agent will inevitably make some candidates appear "better" or "worse". Perfecting the proposed Turing Test 2.0, we may arrive at the normative tool for recognition of moral agents regardless their type of embodiment (Fuller, 2019). However, this tool also opens the door for non-recognition of humans as persons or moral agents. Despite that risk, it seems more reasonable to base recognition of personhood on the moral values rather than on the type of embodiment, like it was stressed in different threads of moral philosophy, either focusing after Immanuel Kant on rationality and consciousness (Kant, 1956, 1998), or after David Hume on sentience and

susceptibility to suffering. If the person is defined as conscious, and as sentient being, then we may ask about different kinds of embodiments of persons. The two threads in moral philosophy reflect in the dimensions of mind perception, that is agency and experience.

The subjects in our study are not all embodied in purely homo sapiens species organism, but respondents have attributed them some moral status—lower, or higher, but they were approached as moral subjects. This does not mean that the embodiment does not matter, in matters in the kind of a moral subject the one is recognized, and in the legal space which should be reconstructed, because different kinds of bodily abilities and senses may imply different kind of rights and duties of a person in a society, what should be discussed separately. Instead of fixating on the *Homo sapiens* species as the target of our normative investigations, we might focus on becoming a better person though differently embodied.

The approach presented in our study is based on the philosophical recognition of the person in social relations, in culture and in language, that is on the phenomenology of the person and on its semiotics. The semiotic understanding of the person is founded on interpreting a person as a sign and the sign as embodied meaning interpretated by someone (interpreter) within General Theory of Signs by Charles Sanders Peirce (1958). Considering social and cultural surrounding of a person we are following the line of George Herbert Mead's reflections of "I" and "me", were "me" is constituted in social relations as the response to the generalized other, while "I" is the locus of activity and initiation (Mead, 1934). Being a person is a social, cultural and language fact, that contains both ontological realms entwined: the realm of meaning (mind) and the realm of matter what was stressed by Joseph Margolis (2013). To perceive a person, one must be encultured that must be able to perceive cultural facts, not reducible to matter, because these are Intentional beings in Margolis' terms, that are quite convergent with Roman Ingarden's approach on works of art as intentional objects (Lukaszewicz Alcaraz, 2019).[1] The matter, some embodiment is necessary for any sign to exist. Without embodiment there cannot be a sign, there can be only some pure meaning; and, without cultural thread, there we would be not human persons but only *Homo sapiens* individuals. Possible different types of embodiments, not fully human, do not preclude one from social recognition and from functioning as a person that is a responsible moral subject—moral agent. It is so, because the process of definition and the functioning as a responsible subject take place on cultural and social ontological level.

[1] This was discussed by Lukaszewicz Alcaraz in article on *Intentionality of a work of art in Joseph Margolis metaphysics of culture and Roman Ingarden phenomenological aesthetics* (2019).

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Can Humans Being Machines Make Machines Be Human?

Steve Mann

Abstract

The concept of "cyborg" has been in existence for more than a million years. Vessels were the first cyborg prosthesis, long before the invention of clothing, or even the existence of homo sapiens. Fundamental to the essence of cyborgs is freedom, freedom to explore, and to cross borders of land, ocean, skin, clothes, and body. This thinking leads to a cyborg taxonomy/ontology based primarily on the concept of "border" as defined by skin, clothing, vessel, or fluid boundary ("interface" in both its meanings). A Type I cyborg arises when an organism enters a vessel and a Type II cyborg arises when a vessel enters an organism. The primordial essence of cyborg is fundamentally connected to border/interface, and therefore remains deeply connected to its nautical origins even as it evolved to the more cosmic/cosmonautical (i.e., from sea-ship to space-ship).

Consider the idea of "superhumachines" = human-machine "cyborgs" with superhuman intelligence. The concept creates a multitude of promises, pitfalls, benefits, and risks. Consider as a "grand challenge," the idea of negative oppression, negative slavery, negative vulnerability, etc., as explored 20 years ago in a paper entitled "Can Humans Being Clerks make Clerks be Human?". These concepts are perhaps akin to Stallman's concept of negative copyright (which he calls "copyleft"), Taleb's concept of negative fragility (which he calls being "antifragile"), and Niaudet and Ayrton's concept of negative resistance.

The capacity for self-determination and mastery over one's own destiny (whether exercised or not) is the single most important tenet of a code of ethics for human augmentation, leading us to extend morphological freedom from the body to also the mind, and to a kind of embodied unconcealedness (alethism) rooted in sousveillant systems, while at the same time preserving a capacity for negation of oppression, a nuanced element that will be the single most important grand challenge.

Cyborgs Existed a Million Years Ago

Cyborg is a word that denotes a symbiosis between a living mind+body such as a human, and a machine, such that the machine may be operated as a natural extension of the mind and body. This interaction is so natural that the machine can be operable without conscious thought or effort. The word was coined by Manfred Clynes (Clynes & Kline, 1960) as a

portmanteau of the words “cybernetic” and “organism.” His favorite example is that of a human riding a bicycle in the sense that after a while, the machine is operable without conscious thought or effort, and in fact eventually functions as a true extension of the mind and body (Clynes, 1996; Gray, 1995).

The bicycle was invented approximately 200 years ago (Scally, 2017). The wheel was invented approximately 6000 years ago (Holm, 2019). But the boat was invented more than a million years ago (Johnstone, 2013), long before the invention of clothing approximately 100,000 years ago.

“Waterborgs”: Water Human Computer Interface (Water HCI)

It has been suggested that a boater is as much a cyborg as a cyclist (Mann et al., 2021a), i.e. that cyborgs have existed for more than a million years, long before homo sapiens emerged in Africa around 300,000 years ago (Stringer, 2003; Mann et al., 2021a).

Recognizing the importance of water (i.e., the world’s first cyborgs were water-cyborgs), the Water-HCI (Water-Human-Computer Interface) Deconference has taken place for 23 years. See Fig. 1 and Fig. 2 for WaterHCI-2021.

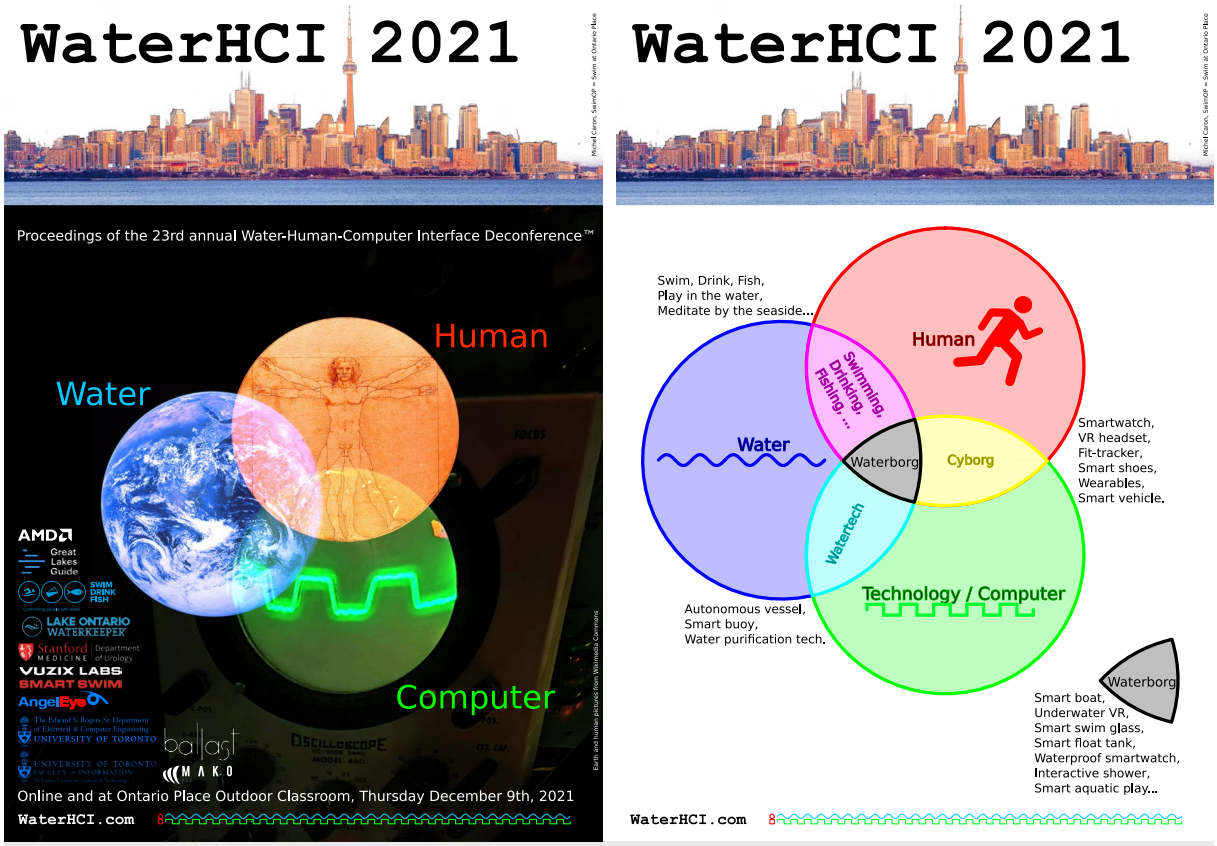

Figure 1. Cover pages from the 23rd annual Water-HCI (Water-Human-Computer Interface) Deconference Proceedings. The Deconference brings together researchers from all over the world working at the intersection of water, humans, and technology. The overlap between humans and technology (e.g., “cyborgs”) is well explored, as is water, but the new under-explored area is where modern cyborgs (modern technological humans) and water intersect.

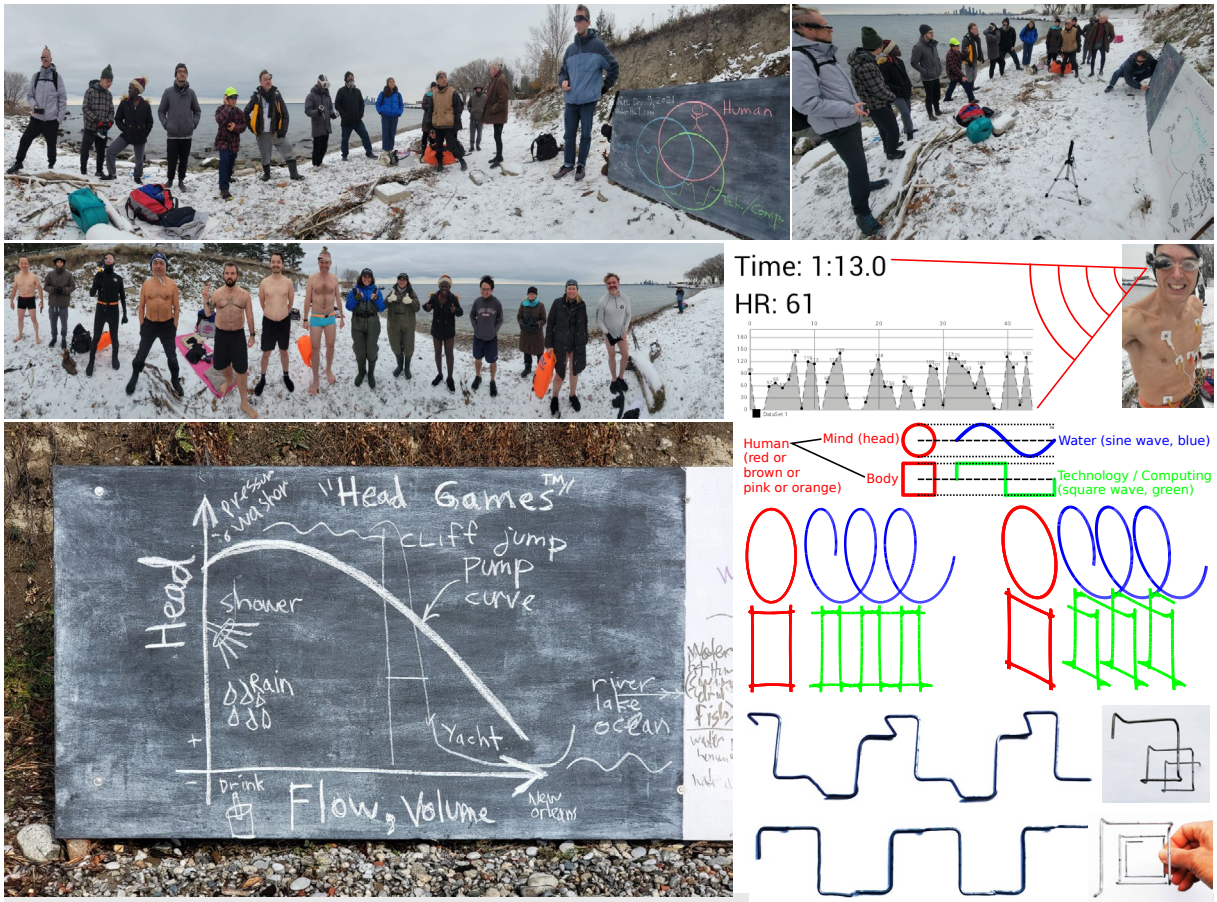

Figure 2. Top row: A small group of SwimOP members doing a presentation for the online WaterHCI audience, led by Cayden Pierce (at the chalkboard), at the TeachBeach™ that we installed at Ontario Place. Middle row: WaterHCI remote demonstration + presentation from TeachBeach as well as including a presenter from Vuzix in the United States, together with icewater swim, showing results of collaboration between C. Travers of Vuzix and C. Pierce at WaterHCI-2021. Bottom row: Presentation by author S. Mann. Pump curves that plot head as a function of flow provide a taxonomy/ontology plane which can categorize many activities and systems such as the bone-conduction drinking fountain (drinking involves suction which is negative head at low flow), showering which is high pressure (head) at moderate flow, and cliff-jumping which is high flow/volume and high head (in terms of kinetic versus potential energy tradeoff). A person who is hydrophobic is one who fears large quantities of water (e.g.,a lake but not a glass). A person who is hydraulophobic is one who fears even moderate quantities of water when it is at high pressure. Compare with (Raffe et al., 2015) which only considers one dimension of this multi-dimensional space. WaterHCI logo design ideas by author S. Mann, including complex square wave sculpture. The human is depicted in red (round head and square body), water waves are symbolized by complex-valued sinewaves in blue, and technology waves are symbolized by M-waves in green (which can, for example, model two-phase electric machines, stepper motors, robotics, etc.)."

Crossing Borders: Cyborg Passports as Morphological Freedom

We often see in the media a proclamation that someone still living today (i.e., not a million years old or even 200 years old) is "the world's first cyborg," e.g., Harbisson claimed to be the world's first cyborg because of a 2004 passport photo showing his cyborg state, as widely reported in the media (Davies, 2004; Donahue, 2017; Wendykowska, 2014).

Earlier passport photos by Mann (1995) underwent a similar process of recognition by government entities (See Fig. 3), but for other reasons, the media had widely reported

that Mann is the "world's first cyborg" as of the 1970s (Shinn, EDT, Nowak, 2003). The author has argued, however, that no person living today could possibly be the world's first cyborg, because the concept itself is older than prehistoric times. What's important here, though, is not so much being a cyborg as the specific concept of morphological freedom, i.e., the freedom to modify one's own body in regards to its form and function. If the passport is to show a true and accurate image of the body, it must do so while retaining this morphological freedom, i.e., the freewill to choose one's own physical expression. This morphological freedom is a central tentet of transhumanism (Bostrom, 2005; Bradshaw & Ter Meulen, 2010).

Figure 3. Crossing Borders and morphological freedom: Neil Harbisson's passports since 2004 and Steve Mann's passports since 1995 have featured cyborg technologies. Although Harbisson makes a "first cyborg" claim based on his 2004 passport as a form of official recognition, the author has held that cyborgs have been in existence for at least a million years and have nautical origins—indeed traveling to distant lands, but long before passports were required for travel. Bottom row: 26 years of cyborg travel by air, water, and land. What is fundamental here is not so much "being cyborg" as, more importantly, the concept of morphological freedom!

From Nautical Cyborg to Astronautical Cyborg

A living being in a vessel would likely have been the world's first "cyborg" and, therefore, there is an inextricable intertwining between cyborgs and water. Thus began the world of cyborgs with the nautical cyborg.

More recently the concept of "astronaut" has emerged. The word derives from the Greek words *ἄστρον* ("astron"), meaning "star," and *ναύτης* ("nautes"), meaning "sailor." Thus "astronaut" means "sailor of the stars." In this way a spaceship or even a spacesuit is a kind of vessel much like a boat in the sense that it defines a boundary or "border" between the astronaut and the environment around the astronaut. More profoundly, the spaceship or spacesuit forms a complete airtight seal that makes the boundary between "inside" and "outside" the vessel much more well-defined.

Vessel and Vironment

A vessel creates a boundary between us and that which is around us. The word "environment" means "that which surrounds us," e.g., the "classroom environment" or the "natural environment," etc., and the term "invironment" is that which is not the environment, i.e., the invironment is us, ourselves.

The border between the environment and the invironment is called the "vironment" (Mann et al., 2021b). The vironment is a generalization of the concept of "vessel" and is a necessary new word because there is no other word that can describe all the related items like boats, spaceships, cars, trucks, clothes, etc., and in this sense "vironment" can mean vessel or vehicle or suit or the like.

This provides a convenient definition of cyborg. A cyborg is a living being together with that being's vironment, e.g., a human plus clothes, or a human plus augmented reality eyeglass, or a boater plus their boat, or a driver plus their car.

Vulnerability and Vironment

A central tenet of transhumanism, the existential cyborgian self-determination and mastery over one's own destiny, is based on the principle of morphological freedom. This is the freedom to choose one's own "shape" (Greek μορφή), i.e., physical freedom of the body. We proffer that this freedom should extend to a freedom of mind, which we might call "myalogical freedom."

Central to this tenet is agency and freewill. This does not mean that we need to maintain control at all times. Indeed, part of freedom is the capacity to temporarily suspend it, by choice, e.g., we might choose to fall asleep in a self-driving car or boat, temporarily relinquishing our control to an AI (Artificial Intelligence) system. In this sense we might still be regarded as a cyborg, i.e., we are still "clothed" in the car or vessel or other vironment.

Ulysses Pact or Contract

In Greek mythology, sirens (*Σειρῆνες*) were beautiful but dangerous creatures, with beautiful singing voices. By way of mesmerizing music and singing they lured sailors to jump into the sea to their death, or to crash their ships into the jagged rocks around the islands where the sirens lived.

Odysseus (*Οδυσσεύς*), whose name is spelled "Ulysses" in Latin (e.g., in legal documents) was a sailor who wanted to hear the siren's song without risk, so he asked his crew members to tie him to the mast of the ship and also to pour wax in their own ears so that only he, but not they could hear the song of the sirens. In this way he could hear and be mesmerized by the music but not act upon it, as he'd instructed his crew to not untie him

until after the ship was safely beyond the audible range of the music. In legal documents such a form of agreement is referred to as a "Ulysses pact" or "Ulysses contract."

In an amusement ride, for example, riders are typically restrained in the ride so that they cannot escape from the ride until the attendant releases them at the end of the ride. In this way the riders are safely contained in the ride.

Waterball Ride: A Vessel with a Very Well Defined Boundary

One popular amusement ride is the waterball (Fig. 4) which we will use as a canonical defining example of a vessel that provides a clearly defined boundary between us and our surroundings.

A waterball is a transparent spherical vessel into which a rider is placed. The vessel is made of a very tough and strong kind of plastic (TPU, typically 1mm thick). The rider is then free to run on the surface of a body of water.

Riders enter through a watertight and airtight zipper that is closed from the outside by a ride attendant or operator, as the ball is filled with air from an electric air blower. An important safety feature of the waterball is that it is designed so that it cannot be opened from the inside. Otherwise, if the rider were to attempt to open the ball, the air would quickly escape and the plastic wrap would suddenly collapse upon the rider, shrink-wrapping the rider who could easily then drown in the water.

In this sense the rider is in the custody of an attendant for the duration of the ride. For safety the ball is tethered to a rope that is usually tied to the attendant who is in or near the body of water. In this way, the rider has temporarily suspended some freedom of movement until such time as the attendant pulls the ball back onto dry land and lets the rider out of the ball.

The waterball is a noteworthy example of a vessel/vironment for two reasons: (1) the precarious state of vulnerability that the rider enters into, i.e., the complete trust in, and reliance upon, an attendant; and (2) the very well-defined physical boundary between invironment and environment. See Fig. 4.

The principle of morphological freedom allows us to choose to enter into the ball, and temporarily become a cyborg, even though we have temporarily suspended our freewill to the ride attendant. In this way we consider the ball to be part of us, rather than part of the environment.

If, on the other hand, a person were to be placed inside such a ball against their will (e.g., a diseased or contagious subject imprisoned in a ball against their will, so they do not spread disease, perhaps in a dystopian world), then the bottom row of Fig. 4 would be redrawn with a solid blue circle leftmost and a dotted red circle rightmost, to indicate that the ball is part of the authorities and not part of the subject inside the ball. The term "brig" as a jail cell aboard a vessel derives from the term "brigantine," a small dual-mast

fighting ship, and from “brigand,” “brigare,” “to fight.” Thus, we proffer that if the ball or other vessel operated as a brig, that it no longer operates as an extension of the occupant’s freewill, and thus is not part of the occupant’s vironment, and that therefore the occupant is no longer a cyborg in the manner in which we envision “cyborg.”

Thus, we need to make a clear distinction between temporarily relinquishing of one’s freedom (as in using an amusement ride, an elevator, public transit, or the like), and a more systemic loss of morphological freedom.

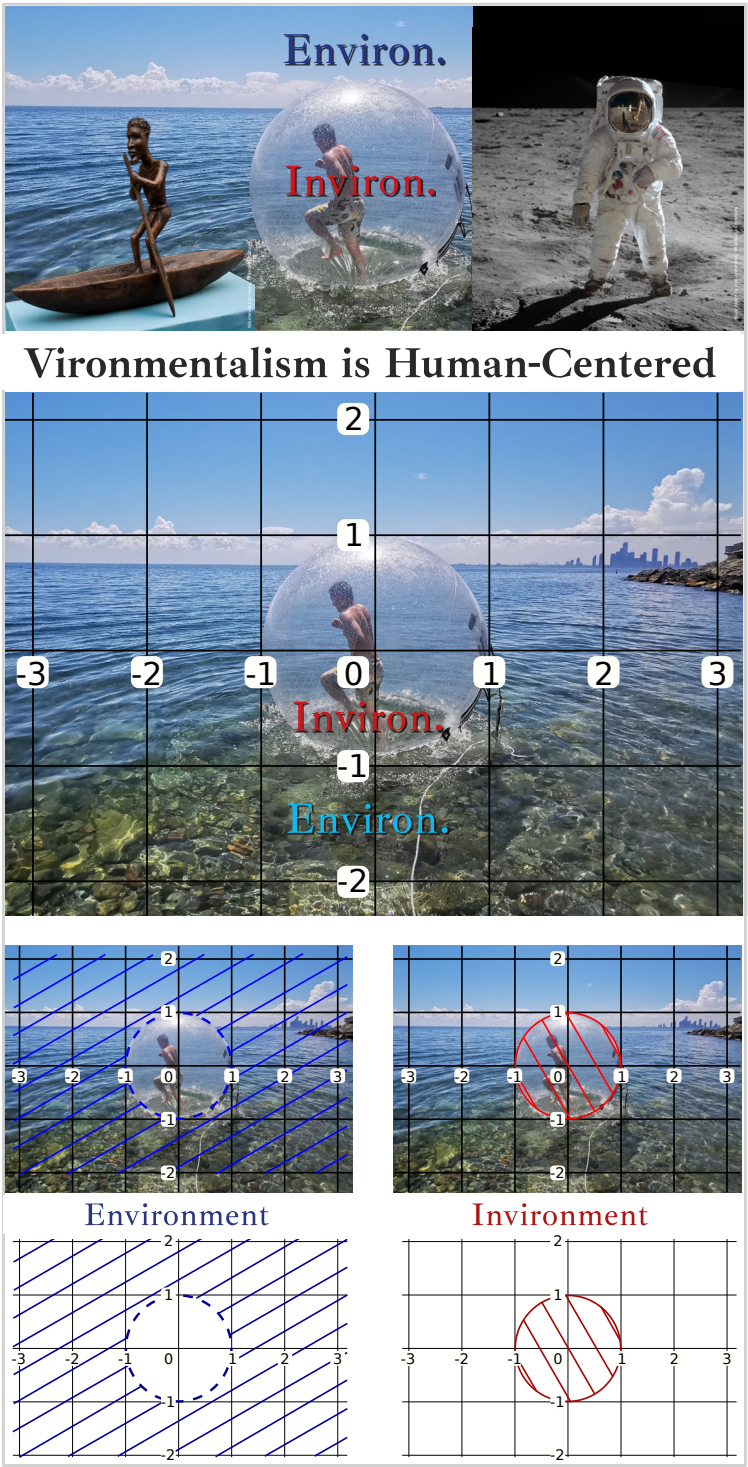

Figure 4. Vessels and Vironment: Waterball ride as case-study. The environment or environs (abbreviated “Environ.”) is that which surrounds us, whereas the invironment or invirons (abbreviated “Inviron.” is that which is not the environment, i.e., us, ourselves. In a boat that boundary is a fuzzy edge that one might imagine whereas in the waterball (or a spacesuit) that bondary is airtight and very clearly defined. Interestingly waterballs are usually 2 metres in diameter (i.e., have a 1m radius), so that if we position the ball upon a grid/graph, with 1m spacing, it creates an almost canonical study in social-distancing where are kept at least 2m apart. We proffer that morphological freedom mandates that the vironment (boundary or vessel) be part of the invironment rather than part of the environment, as shown in the bottom row.

Galley Waterborgs

The early days of cyborg technologies were days of freedom and liberation, i.e., being able to travel to distant lands. The early visions of the galley slave, chained to the oars of a ship, are largely an historical inaccuracy (James, 2001). However, it is perhaps useful to think of the concept of a "freeborg" (free cyborg) versus technologies that "empower" or disempower prisoners in service of others, e.g., to ask whether a galley slave is a cyborg or not, given that the vessel is an extension not of their own freewill, but that of another person or persons or entity (e.g., perhaps an autonomous or machine intelligence).

Cyborg Code of Ethics

To capture these important concept, a panel of seven thought leaders and 18 authors were brought together to debate and draft the "Code of Ethics on Human Augmentation" (Mann et al., 2016) based on earlier work in this area (Mann, 2004) which is ongoing (Morrow et al., 2020).

This Code of Ethics was based loosely on Asimov's 3 rules of robotics (Asimov, 1942; Clarke, 1993), while recognizing that Asimov's 2nd law (a robot may never, through action or inaction, allow harm to a human) would likely lead to tyranny of the worst kind:

> Of all tyrannies, a tyranny sincerely exercised for the good of its victims may be the most oppressive. It would be better to live under robber barons than under omnipotent moral busybodies. The robber baron's cruelty may sometimes sleep, his cupidity may at some point be satiated; but those who torment us for our own good will torment us without end for they do so with the approval of their own conscience.
>
> C.S. Lewis

Cyborg Freedom and Agency

It has been observed that in a free society, the degree of freedom-of-choice varies in approximate proportion to physical nearness, i.e., even when our surroundings are not of our own choosing, at least our clothes generally are. And even if we're forced to wear a uniform while at work, our tattoos or other body markings (which are even closer to the skin) are of our own choosing. This concept appears in Fig. 5, reproduced from Figure 1 (Mann, 2001, p 98).

One freedom that was explored was the concept of equiveillance, and also detection of inequiveillance. An example equiveillance app works by way of object recognition on "no photography" signs which often look quite similar. When these signs are recognized recording begins. A "no photos" sign is an indicator of a high degree of concealedness (low degree of alethia) and therefore an indicator of possible danger, which warrants increased sousveillance (covert recording).

We could envision a future in which cyborgs share their viewpoint, e.g., if you are interested in buying a specific item such as, for example, an avocado, consider the following example. You enter the supermarket and broadcast wirelessly your desire to see where the avocados are sold, while streaming your live video feed for others nearby to receive. The shopkeeper (or maybe another customer) streams back their live video feed to you, so you can see yourself on their camera. Perhaps also an overlay appears showing you where the avocados are, and you can see yourself on their camera and use their camera to help you find your way. This assumes the shopkeeper wants to do business (or that another customer wants to help). More generally a customer can ask whether the shopkeeper wants to declare business (cooperation and sharing of video feeds) or declare war (antagonistic hoarding of separate video feeds). If the shopkeeper decides to declare war, then it makes sense to record video secretly and at full bandwidth because the shopkeeper has decided against a shared alethism-based interaction. See Fig. 6. So, a general principle of cyborg etiquette would be to first offer a live feed (shared point-of-view) and first assume a friendly encounter (collaboration) and only move to an antagonistic encounter (closed and covert rather than open and overt) when another party does so. It should be noted that many vehicles have cameras and that this is seldom challenged.

CAMask™: The Camera Mask

One approach to "normalizing" sousveillance is the author's CAMask™ which combines cameras with respiratory protection, together creating a medical device that provides automatic contact-tracing and situational awareness for safety. In this way sousveillance becomes as necessary and as legitimate as surveillance. Moreover, on a practical level, officials are less likely to ask the wearer to "take that off" as doing so might result in increased spread of disease.

Negative Danger, Negative Oppression, and Negative Slavery

> In the electric age we wear all of mankind as our skin.
>
> Marshall McLuhan, 1965

In 1968 Marshall McLuhan identified the computer as "an extension of our central nervous system" and our "technological clothing" (McLuhan et al., 1968). To the extent that computing can become part of us, as stated earlier, we need to generalize the concept of morphological freedom to also include a freedom of the mind, let's say "myalogical freedom" from the Greek word *μυαλό* ("myalo") for "mind." When we "jailbreak" a smartphone, for example, we're exercising this myalogical freedom, e.g., to run GNU Linux on a computer that might otherwise only run a jail-based operating system.

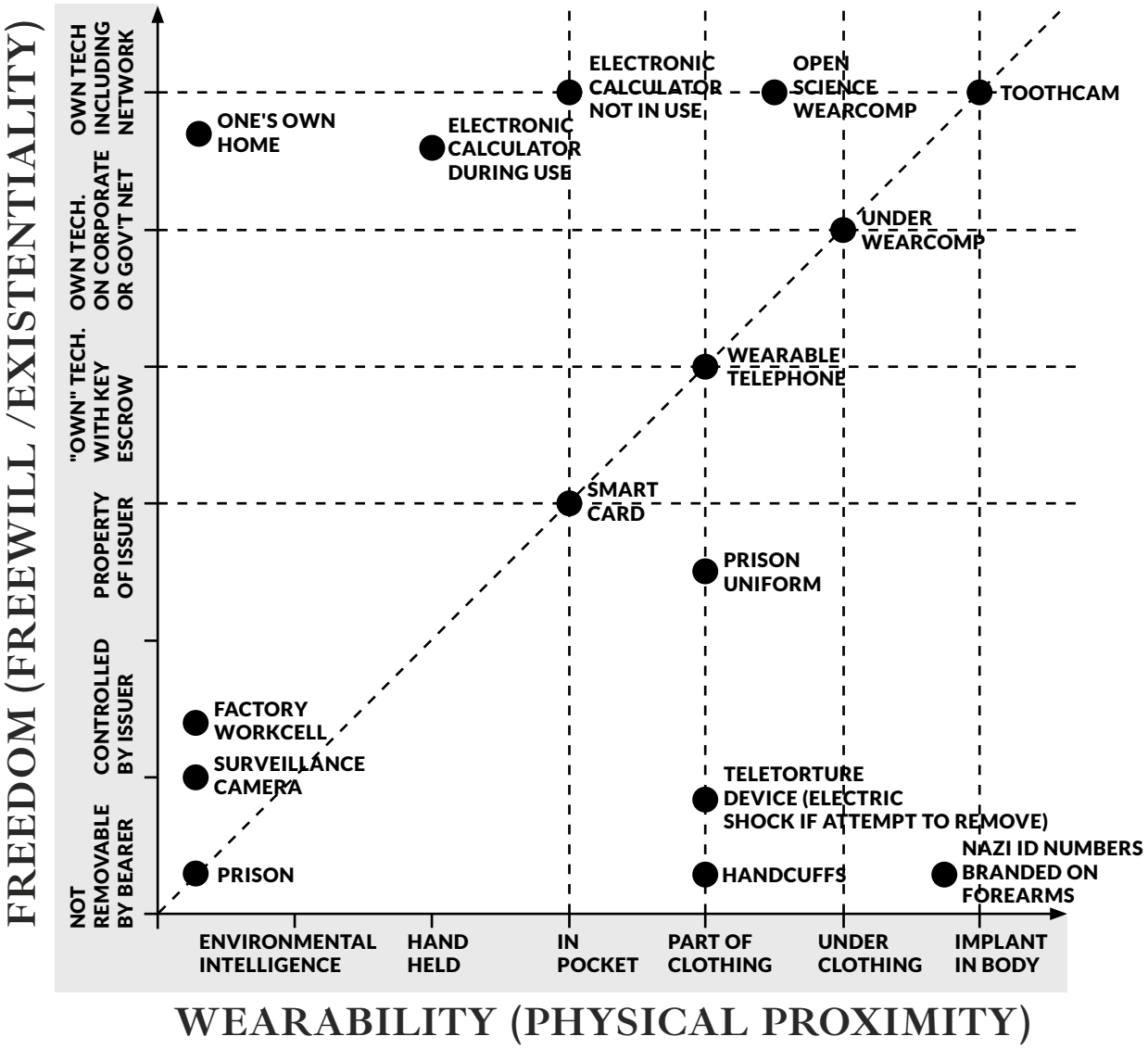

Figure 5. In a free society, we mostly have greater freedom over our invironment than our environment, i.e., things that are physically closer to us are generally things that we have greater choice in. We can conceptualize a graph or plot with two axes: Wearability/Portability/Proximity-to-body: the ease with which they are attached to the body, starting with a continuum from environmental intelligence (cameras and microphones and computers installed in the cityscape or architecture), and then ranging to hand held devices, to wearable computers, and finally to going right inside the body (implantables); Freedom/Existentiality: the degree of self determination and mastery over one's own destiny that they provide, e.g., how much control the individual bearer has over the device. It is evident from this plot, that there are a large number of devices along or near the X=Y (Wearability=Freedom) axis. Examples of outliers away from this axis are shown, but these tend to be less common in the everyday life of a free society. Therefore, we tend to think of portable (hand-held) and wearable devices as being liberating, or freedom-inducing, whereas environmental technology (such as surveillance cameras) are often installed without our knowledge or consent. Examples of technologies in close proximity to our bodies, but in distant locus of freedom (i.e., controlled from afar) include handcuffs. We proffer that technologies like handcuffs are not true cyborg prostheses (at least in the traditional sense), as they are not part of the wearer's vironment. Reproduced from Figure 1 of (Mann, 2001, p. 98).

> Everyone will be permitted to modify and redistribute GNU, but no distributor will be allowed to restrict its further redistribution. That is to say, proprietary modifications will not be allowed.
>
> (Stallman et al., 1985; Stallman, 1990)

This idea that many operating systems are intellectual or mind-based jails or prisons was the main driving force behind GNU Linux and more generally the GNU philosophy of "copyleft," a kind of negation of copyright (Stallman et al., 1985, Stallman, 1990). Rather than merely set copyright to zero, as might be envisioned by a continuum from no copyright to full copyright, the concept of copyleft is a clever construct that reverses rather than zeros-out copyright. The idea that copyright should be abolished was often viewed as an extreme position, but Stallman created an even more extreme notion that complete abolishment of copyright was itself a form of centrism, let's say, at the zero of the numberline (Fig. 7), and that a new construct could be created. Fragility is another variable that was once thought to vary from highly fragile, down to zero fragility (infinite robustness), but has also experienced an unsigned to signed transition through Taleb's concept of "antifragile", i.e., systems that actually benefit from perturbation (Taleb, 2012; Tseitlin, 2013).

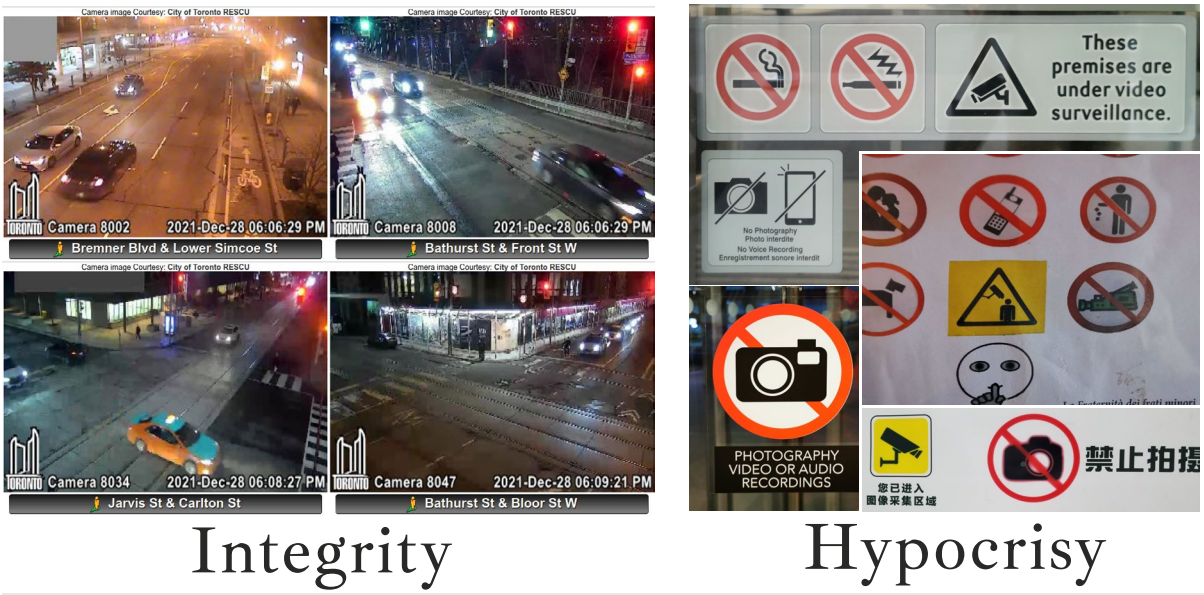

Figure 6. Integrity of surveillance versus surveillance hypocrisy. When people work together they can help each other see (City of Toronto traffic camera feeds are available for public use to help in navigation, situational awareness, etc.). However, with hypocrisy (surveillance while prohibiting sousveillance) we have data hoarding, data collection, etc., combined with concealment. Alethiometric systems detect this hypocrisy and signal danger, alerting individual cyborgs and others to begin covert recordings to protect against the dangers of corruption, hopefully leading to a Streisand effect (Jansen & Martin, 2015). In some sense this hypocrisy could be regarded as a form of information warfare, a response to which might be heightened personal safety measures. Alethiometric apps for example, begin automatically recording when they recognize this "signo" (the "no cameras" sign).

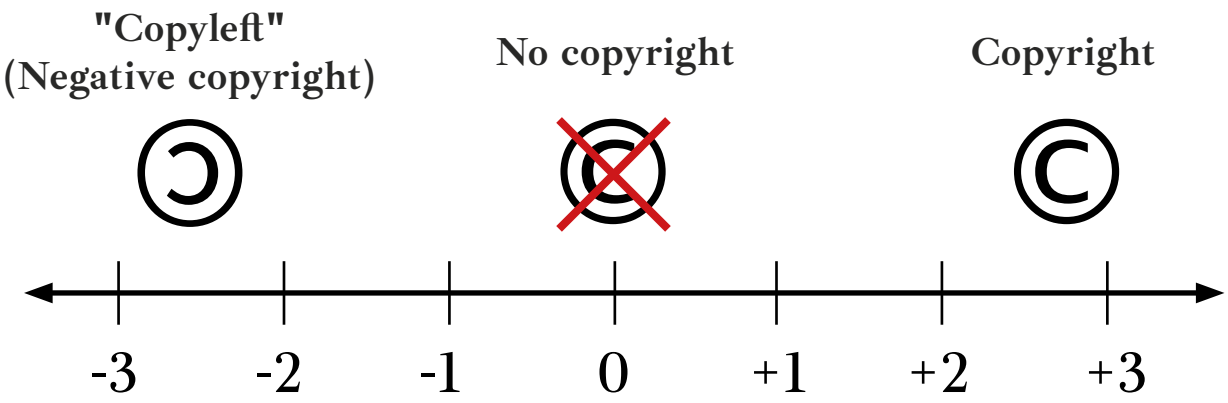

Figure 7. The Copyrightness Axis: the complete abolishment of copyright once seemed like a radical extremist view, but in 1985 the GNU Manifesto arguably puts this idea as centrist, at exactly zero on a numberline that extends in both directions therefrom. The backwards copyright symbol now even has a unicode, (U+1F12F).

Welcome to the Machine

Welcome my son Welcome to the machine Where have you been?
It's alright we know where you've been.

Roger Waters

The word "machine" is often used in the wide sense, to denote a systemic and often inflexible authority (whether a collective human intelligence or an artificial intelligence), or more generally, a "bigness" == big data, big AI (Artificial Intelligence), big banks, big pharma, big government, big science, and "big watching" (surveillance) (Jensen & Draffan, 2004; Bousquet, 2014; Sprague, 2014), or, more generally "The Bigs" (Mann et al., 2021a) as many of these large entities are intertwined in ways too complicated for an ordinary entity of human-scale to understand.

A central thesis of this paper is that in order to interface to big machines, we ourselves as individuals need to become machines, i.e., embody "humanistic intelligence" (H.I.) (Minsky et al., 2013) in which each of us has our own "little machine." What we mean by "little machine" is one that is of our own choosing, design, etc., and functions as our personal agent, with our own personal best interests in mind.

In this sense, if we think of human-machine interaction, i.e., a machine as the vironment, we might ask the question as to whether the machine is part of the invironment (e.g., under the control of the human) or environment (e.g., under control of a separate "master").

Is a member of a collective still a cyborg? Is a galley slave a cyborg? What about two or eight people rowing together? At what point does the vironment cease to be part of the individual? These are all very nuanced questions that need careful consideration and debate. For example, a group of workers might form a union, and we could regard

the union as a "machine," i.e., a large inflexible entity that can resist the oppression of a large inflexible company (can humans being "cogs" in such a machine make corporations be human?). It could be argued that such a construct could function as a form of negative oppression. Thus, if an employee is taking the time to put on the right safety equipment and faces peer pressure or production pressure to skimp on safety, the employee can say "I'd be happy to work in dangerous conditions and sacrifice my life for your increased profits but my union won't let me." Similar constructs have also been suggested for mandating free-open-source computing environments such as GNU Linux (Dr. Steve Mann, Assistant Mailroom Clerk employee number 9432 et al., 2001).

Humans Being Machines Can Make Machines be Human

More generally, humans being machines (e.g. members of an SMO (Mann, 2001)) such as EXISTech Corporation (Dr. Steve Mann, Assistant Mailroom Clerk employee number 9432 et al., 2001) can make machines (e.g., bureaucratic organizations or inhumanly rigid artificial intelligence) be human.

This is the possible essence of negative exploitation, if implemented correctly. That is of course one of the grand challenges of our research efforts.

Sousveillant Systems

OED (Oxford English Dictionary) defines sousveillance as

> Close observation or recording of the government, police, etc., by members of the public, typically using personal devices such as video cameras and smartphones. Also: the recording or documenting by members of the public of their own or other people's activities using such devices. Often contrasted with surveillance.

The concept has recently been generalized as "sousveillant systems" to denote systems that are designed to facilitate close observation by end users of these systems, e.g., explainable AI that has the explainability built-in so that end users can easily understand its inner workings. See also (Broekhuis, 2014, Freshwater et al., 2013; Fletcher et al., 2011; Ganascia, 2010; Weston & Jacques, 2009; Mann, 2002; Mann et al., 2018).

The fundamental principle of auditability is that systems are designed to facilitate auditability even though they are not necessarily audited. An example is the use of free-and-open-source (FOS) computer programs. FOS benefits all those who use it. It is not necessary that all users will want to, or even be able to, look at or understand the source code, just that the possibility exists. This is the Greek concept of truth as unconcealedness (*αλήθεια* or "alethia" which means that which is not hidden).

More generally, we wish to construct and live in sousveillant cities, buildings, and other systems that are founded on the Greek principle of unconcealedness.

What is most disturbing is the loss of interoperability that once existed, e.g., we hear people say "He skyped in" or "She's joining us by Zoom" or "Join us on a Teams (Microsoft) meeting." We never used to say "He Belled in" in response to use of the Bell Telephone network. To "Bell" someone never became a verb because the telephone was interoperable, and a person with a Bell telephone could place a call to anyone with any other make or model of telephone.

Yet to call someone now, we need to be running the same, usually closed-source app such as Zoom if the other party is using Zoom, or Skype if the other party is using Skype, and so on

We call for an end to this, and advocate FOS standards like Jitsi which is a free-open-source (FOS) video conferencing program compatible with WebRTC, an open standard for Web communication.

As technologies become more intimate and move from the desktop to our pockets and to our bodies, we must stand for FOS as a required element.

Inverse Ulysses Pact

As we develop cyborg technologies, we might wish to consider a kind of inverse of the Ulysses pact, i.e., a situation in which an individual may be "bound to freedom" without sacrificing freedom to an entity that might co-opt that structure. This would be implemented through a form of blockchain (or other distributed "little data" rather than centralized "big data") technology.

Alethism and Openscience

The author created the concept and coined the term "Open Science" in 1998/1999 and sold the openscience.com domain to degruyter.com in 2011 (Mann et al., 2015), for what science should be, i.e., unconcealedness. Such openness can be extended to other fields such as engineering, computers, AI, machine learning, etc., for which "alethism" (*αλήθεια* or "alethia" which means that which is not hidden) could be implemented more broadly than just within the scientific community. This idea is at the core of the third law, in the Code of Ethics on Human Augmentation (Mann et al., 2016).

"NullBorg": Minimum Viable Vessel

A discussion on cyborg ethics would not be complete without mention of the freedom to not be a cyborg. Increasingly technology is not just being made available to us, but is being required. Shoes and shirts, and more recently, masks, must often be worn in certain

establishments, and increasingly identification must be carried. Ducks and geese enjoy greater freedoms, in some ways, than humans, e.g., in regards to being able to cross borders without being required to show any identification or paperwork. Certain places can only be accessed by those in cars or boats, e.g., no pedestrians, no swimming, etc., whereas a healthy ecosystem and environment is one that is pedestrian-friendly and swimmer-friendly.

A non-cyborg (e.g., a person not in a vessel) is not allowed to go to Toronto Island, as it is forbidden to swim there. In previous work, the philosophical and technological concept of MVV (Minimum Viable Vessel) was explored in this regard (Mann et al., 2021a). The MVV asks the question "What is the minimum required amount of technological clothing needed to access certain cyborg-only spaces?"

The DCR (Department of Conservation and Recreation) banned open-water swimming in Walden Pond after some drownings. This forced swimmers to swim within a small crowded roped in area. A professor who was also the chair of the Department of Philosophy at University of Massachusetts Lowell defied the ban and swam anyway (Kaag, 2021b), and more generally, a petition with more than 11,000 signatures reversed this ban (Kaag, 2021a). Swimmers still wear a safety-visibility marker called a "towfloat," which in some sense could be regarded as a MVV for safety.

Conclusion

Humans being machines can make machines be human. The grand challenge here is in how to implement the concept of an SMO (Safety Management Organization) that is not co-opted by the same forces that act against humanity. Moreover, there is an intricate and nuanced balance that must be struck between alethism (unconcealedness) such as free-open-source (computers, machines, openscience, humanistic intelligence, etc.) and the right of privacy for individuals. Given the forces that large machines can apply against the individual, there is a pressing need, now more than ever, to create a kind of inverse machine, a machine that holds machines in check.

> If there is a hard, high wall and an egg that breaks against it, no matter how right the wall or how wrong the egg, I will stand on the side of the egg. Why? Because each of us is an egg, a unique soul enclosed in a fragile egg. Each of us is confronting a high wall. The high wall is the system which forces us to do the things we would not ordinarily see fit to do as individuals (...) We are all human beings, individuals, fragile eggs. We have no hope against the wall: it's too high, too dark, too cold. To fight the wall, we must join our souls together for warmth, strength. We must not let the system control us—create who we are. It is we who created the system.
>
> Haruki Murakami,
> Jerusalem Prize acceptance speech, JERUSALEM POST, Feb. 15, 2009

How best to implement such a machine, be it a free-open-source wearable computer, or similar alethist system, remains an important area of research.

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Steve Mann (PhD, MIT '97, P. Eng.), is widely regarded as "The Father of the Wearable Computer" [IEEE ISSCC 2000], and invented wearable computing as well as the hydraulophone (as both an acoustic instrument and as water-human-computer interaction) in his childhood in the 1960s and 1970s. In the 1980s he invented HDR (high dynamic range) imaging. In the 1991 Mann and Charles Wyckoff invented, and coined the term, X-Reality (XR as eXtended Reality). Mann is a founding member of the IEEE Council on eXtended Intelligence (CXI), and a tenured full professor in the Department of Electrical and Computer Engineering at the University of Toronto.

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Preprint: https://www.researchgate.net/publication/357429311 Can Humans Being Machines Make Machines Be Human

cDNA: Designating the Cyborg

Andy Miah

One of the problems we face when defining the cyborg, is that, by doing so, we create the expectation that there is something fixed about its form that we can identify and which enables us to distinguish it from other beings or objects. Moreover, a crucial component of this determination is the desire to determine it as a being, rather than an object. Cyborgs are invoked as agentic beings, where this agency is located in some interaction between biology and technology. This applies to the loosely characterised bicycle as a cyborgian assemblage, as it does to the mobile phone, the nanomolecular robots, or even the contact lens and the contraceptive pill. Indeed, the problem with the cyborg as a cultural construct—which explains the relative apathy that exists about its ascendance—is that it is easily categorised as all things. Even our environment can become designated as a cyborgian entity, for its capacity to transform the category of nature into something that is denaturing.

This definitional mutability is a crucial characteristic of the cyborg and a critical element in its stealth-like ability to incrementally assert its prominence in the world, analogous to a small piece of DNA, which gradually inserts itself into larger strands, replicating and, eventually, infusing itself across an entire organism, thus transforming it into something else. It is this capacity to transform nature—and specifically, human nature—which has been the focus of political and sociological concern about the cyborg. The anxiety spoken of in Francis Fukuyama's *Our Posthuman Future* was of an indescribable "Factor X," which would be lost, if we allow science to take humanity to its logical extreme and secure an endless, suffering free, and ultimately superhuman existence. Indeed, these themes are present in so much literature about the superhuman. The loss of vulnerability that the superhero enjoys is often treated as a loss of humanity and something that urges us to be cautious and even maintain the superhero as an outsider to our human community.

When I look back on the last 25 years of cyborg theory and practice, I observe an expansion of the scholars who seek to draw upon the idea of the cyborg to advance, often, poststructuralist theories about the state of the world. From the desire to challenge the relentless pursuit of technological advancement in such endeavours as space exploration or the metaverse, to the desire to urge that we attend to those of greatest need in our utilisation of scientific knowledge, the cyborg is treated as both hero and villain, a core narrative arc in a story about what humanity wants for its future. The cyborg symbolises an end state of human evolution which consists of going beyond nature in ways that can lead

to the posthuman turn in how we think about ourselves and apply categories of meaning and systems of organisation that would, fundamentally, shift away from our deepest pillars of human existence. The cyborg calls for cyborgian rights, not human rights. The cyborg shifts our gaze away from DNA to what we may call cDNA—cyborgian DNA—which is necessarily an evolved state, enabled by technological discovery. This is why contemporary cyborgian notions accommodate such technologies as gene editing, as today's cyborg is less defined by the integration of artifice or mechanics into biology and more a product of these nanomolecular devices, which have succeeded in harnessing and modifying nature.

The challenge we face as scholars is that the original definition of the cyborg was made for a different time, which was largely based on a mechanical view of technology. We thought about the cyborg as a being that involved humans becoming intimately connected to machines, but where we could still, reasonably, identify the point of connectivity, where machine meets biology. It was also a concept that was a product of the industrial era, where the growing encroachment of the machine led to greater anxieties about humanity's place in the world and, to some degree, the cyborg was invoked as a symbol of caution.

Today's cyborg is not like this (although it still gives cause to consider how it relocates our position in the ecosystem) and so our definition of the cyborg must evolve. Everything we have learned about nanotechnology, biotechnology, information technology, and cognitive technologies over the last 25 years speaks to a new generation of the cyborg, where it is reconstructed from a deeper knowledge of nature and how we may use biochemical activators to renature biology and where this renaturing is the critical component of the cyborg.

Presently, the term cyborg is still used in a way that is similar to the word "human" and, as we find countless variations of the human, so too, do we find countless variations of the cyborg. Yet, in all of those human variations, we do not speak scientifically, yet, of how these variations undermine the species category of *Homo sapiens*. With all of our variations, this definition persists as an overarching label attached to all homo sapiens and this is why we must further distinguish the concept of the cyborg, as its mutability is so varied as to make similar claims impossible.

Thus, the first principle we should acknowledge when determining the cyborg's place in history is that it is an inherently species fluid concept, to the extent that the determination of a thing as a cyborg is to do it a definitional disservice. It would be like designating all life on earth as essentially the same thing, with simply species labels expressing minor variations. Of course, there may be some merit in holding such a view. For example, we know that species variation can arise through very small differences in DNA and to approach the cyborg as a species fluid concept would elevate our appreciation for how humanity is intimately connected to all forms of life on earth, perhaps leading to a greater degree of care for non-human nature.

In this way, the cyborg concept immediately invalidates itself as a label that can identify specific things, as it encompasses all that is possible to locate as being a hybrid of biology and technology. If we can call a person a cyborg when they are using a mobile phone, or riding a bicycle, or communicating through neural links, or when they are genetically enhanced, then we should conclude not that the sense of cyborg lacks meaning, but that its meaning is comparable to, say, carbon or DNA. The term cyborg is the connecting concept across these new forms of species classification, not a label attached to any specific thing or being. This does not mean the absence of a cybernetic component to the cyborg. It is just that, the closer we get to artifice, the clearer it becomes that it makes sense also to treat it as nature.

At this point in history—where we are all cyborgs now—we risk losing sight of the provocation that the cyborg brought to humanity by generating useful conversations about what kind of life is worth living. At its core, the cyborg is a concept that leads humanity to consider the characteristics of a good life. Is a good life characterised by living forever, being always connected, having unbound freedom to assert our agency, or to reimagine our relationship to all other forms of life on earth? These are the questions which persist in our interrogation of the cyborg as a symbol of humanity's trajectory, which is why, also, the cyborg will persist as a subject of sociological and philosophical concern.

It may be more helpful to designate the cyborg as cDNA to secure its future as a species fluid life form, which is non-human centred, capable of encompassing its definition as both the fusing of bio and biotechnological materials, while also accommodating the historic, mechanical definitional categories. Yet, I find it more likely that, in the future, this Cyborg 1.0 definition will cease to have meaning in designating a subject of concern and everything that has happened in the last 25 years of cyborgian technologies seems, on balance, to confirm this. We are all cyborgs now and we love it.

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The Human and the Machine: Between Absolute Autonomy and Symbiosis

Monika Michałowska in Conversation with Marco Donnarumma

Introduction

Autonomy is individualized. Autonomy is personal. Autonomy is singular. "I am autonomous if I rule me, and no one else rules I," as Joel Feinberg says (1980, p. 21). Obvious though this claim may sound, its absoluteness raises doubts and questions as to what this actually means, especially in the pervasively technologized world that neoliberal societies inhabit.

This contribution questions the absoluteness of autonomy. It ponders the human-machine relation, focusing on the issues of co-dependence, a relationship that the authors of this paper perceive as incomplete and unsettled, always in progress, and constantly fluctuating. It may be understood as a way of learning each other and of learning from one another. This contribution revolves around two case studies: a) *Corpus Nill*—a body-machine performance that uses learning software (AI software); and b) neural medical devices based on so-called closed-loop systems (operating automatically without the user's control) that are used in the treatment of several neurological and psychiatric diseases. It inquires what the human-machine relation is in these case studies, a question we believe is central in discussing the concept of a cyborg (a hybrid of flesh and technology). It suggests that technology can be perceived as an incorporation into the body rather than an extension of the body. The relation the body and technology are involved in invokes yet another problem, namely whether they function (and if so, whether they should) separately and independently or mutually relying on each other, being in a constant interdependence; which brings forth the autonomy-issue.

Since autonomy is conventionally regarded as a constitutive, if not the most fundamental, feature of a moral agent and bespeaks our personhood, any device or software operating without an individual's active involvement or will seems to pose a threat to this individual's autonomy. In this contribution, we argue to the contrary that amalgamating multiple—human and machinic—agencies may offer a potential for alternative forms of embodiment. Whether this potential expands, undermines, or ramifies human embodiment depends on social factors, such as class, race, gender, and physical ability. However, what is important is that questioning the absoluteness of autonomy helps highlight the possibility of a human-machine symbiosis that fosters cooperative modalities of being, rather than antagonistic relations.

Body-Machine Performance and Autonomy

This brief study starts with *Corpus Nill*, a performance by Marco Donnarumma, that had its world premiere on 6th February, 2016, at ZKM Center for Art and Media, Karlsruhe.

Corpus Nil live at ZKM, Center for Art and Media. Photo courtesy ONUK/ZKM

Corpus Nill is a performance that brings to light the perspective of becoming one with technology in the sense of incorporation rather than extension. The enhancement, cyborg, and AI debates frequently underline the element of extension in their definitional and argumentative approaches, pointing out that in an enhanced human/a cyborg technology is an extension of a body, something attached to it. Depending on the way the body is extended through technology, various elements and notions come into play. Yet, they almost invariably outline binary schemes: subject versus object, autonomy versus the lack of autonomy, and the like. This approach underpinned by simplifying and simplified dichotomies both reflects and petrifies the binary standpoint. Perhaps a shift from an extension perspective to an incorporation one is required in the debate (Donnarumma, 2017). This approach is visible in the way *Corpus Nill* transgresses from the "external" to "internal" to view a cyborg as an assemblage or even a unity. As Donnarumma puts it:

> [t]hanks to a sophisticated set of algorithms, each nuance of the body's motion sets off a synaesthetic play of sound and light directed by the machine. The biological signals of the body influence the choices of the machine, but cannot control what it will do. In turn, the auditive and visual saturation produced by the machine influences the body's movement, but disrupts its perception and motor skills at the same time. Despite being intimately linked to the human body, the machine is autonomous and chooses by itself how to respond to the performer's movements.
>
> (Donnarumma, 2016)

The notion of incorporation, which rests on feminist philosophy (Shildrick, 2013; Sobchack, 2010), in this performance adds yet another dimension to the notion of the cyborg highlighting the interplay between the naked body and the software, the mutual influence between flesh and technology, the interdependence in being and reconfiguring. The instability and unpredictability of the algorithm is embedded in the coexistence of a human and technology to become the fundamental feature of the new being.

Novel Neural Technologies and Autonomy

This section focuses on the use of novel neural technologies, such as deep brain stimulation (DBS) and brain-computer interfaces (BCIs). The application of DBS and BCIs has recently prompted a debate on whether neural technologies pose a threat to personal autonomy (Michałowska et al., 2021). Some authors have voiced the concerns that such medical interventions are potentially harmful, and that they may deleteriously affect people's choices, selves, and authenticity.

The list of potential threats gets longer in the case of DBS and BCIs given the fact that some neural implants (brain implants) based on closed-loop systems operate automatically, which, as it is argued, diminish or entirely eliminate personal autonomy. BCIs employ intracortical sensors, decoder algorithms, and translators to record, analyze, and convert real-time brain activity into particular information. The data is collected and then processed into commands which control an external device just by thinking about the movement, or via wireless communicational systems. BCIs and neurostimulation devices are designed as open- or closed-loop systems. This contribution focuses on the closed-loop systems since they generate bioethical concerns. Closed-loop systems receive nonstop information input from the person's brain, which enables them to adjust the parameters on their own through an algorithm. Medical studies prove that BCIs and DBS have been successful applied to treat numerous neurological and psychiatric diseases. What is important is the fact that closed-loop implantable devices for monitoring neural activity are activated automatically, and operate beyond a person's will and control. A therapeutic action is undertaken solely by technology, based on the detection of neural activity, which means that the person is kept outside the decision loop.

Control and free decision making are generally acknowledged the constitutive, or even fundamental, features of an autonomous agent. It is also commonly agreed that one's internal acceptance of and control over the action that is to be undertaken are crucial in assessing one's autonomy (McCann, 2021). In this section, I [MM] argue that the alleged threatening perspective concerning the use of DBS and BCIs is unsound, and furthermore that constant and total control and/or an absolute freedom of decision-making are not the necessary conditions of personal autonomy. In my view, for a person to be a free, autonomous

agent absolute voluntariness and self-controlled is not a condition *sine qua non*. Moreover, it is often impossible to satisfy such a requirement. Not all our everyday life choices are voluntary in an absolute sense or *per se* (namely they are not always preceded by one's internal acceptance); we often do things out of habit, act routinely. All habitual actions, such as tying shoes or riding a bike, can serve as worn-out examples of learned, rigid, automatic, and unreflective behavior. Yet, acting automatically does not deprive one of freedom or autonomy. Analogically, one does not lose self-sovereignty and autonomy by simply not being in total and constant control of administering medications and thus falling outside the decision loop.

Since drug-resistant epilepsy is one of diseases that have been treated with the use of closed-loop systems, it can serve as an example here. Epilepsy reduces significantly the range of choices individuals may make and activities they may be involved in. Paradoxical though it may sound, relieving epilepsy patients of the necessity to make decisions about behavior in expectation of seizures enables them to interact with their environment with more independence and freedom. Preventing epileptic episodes allows one to be more self-determining in their choices, which in fact broadens the array of choices and options. Riding a bicycle can serve as an example: being in the decisional loop entails the necessity what to do: to stop, get off the bike, lie down, etc. This interference with the activity of riding a bike triggers a constraining pause in it, whereas being kept outside the decisional loop eliminates the constraint and interruption. Brain-computer interfaces and deep brain stimulation devices may not only reduce symptoms and help treat syndromes, but also lessen the fear of symptoms of diseases. Thus, keeping an agent outside the decisional loop enhances her/his sense of agency and of being the author of her/his own life-biography.

Concluding Remarks

I [MM] will conclude with a certain thought that has come to my mind while having this dialogue on various aspects of cyborgization with Marco Donnarumma. Recently, we have been witnessing that the more pervasive, commanding, and self-confident technology becomes, the more vigorously people tend to manifest radical opinions, where radicalness is purely a façade or simply an expression of fears of the unknown and new. Some authors even warn us that

> [i]t is rather a fear that, in the end, biotechnology will cause us in some way to lose our humanity—that is, some essential quality that has always underpinned our sense of who we are and where we are going, despite all of the evident changes that have taken place in the human condition through the course of history. Worse yet, we might make this change without recognizing that we had lost something of great value.
>
> (Fukuyama, 2002, p. 101)

Yet, I [MM] am convinced that the sense and the greatest value of who we are lies invariably in our ability to incorporate technology into our lives and into our bodies, to continuously shape and transform ourselves, and to be in a constant flux, a continuous form of becoming, of being redefined or even undefined (at least to a certain extent). May the perspectives discussed in this paper open a new territory of a cyborg-debate allowing us to go beyond hierarchism and binarism.

This contribution has been based on the dialogue Monika Michałowska and Marco Donnarumma had before and during the conference, as well as on a paper by Michałowska et al. on neural devices and autonomy.

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Crossing the Border of Subjectivity: The Post-Phenomenological Subject at the Intersection of Nomadism and Cyborg Art

Monika Murawska

The aim of my contribution is to reflect on the post-phenomenological concepts of the subject presented by philosophers, such as Henri Maldiney or Jean-Francois Lyotard in connection with the figure of nomada created by Rosi Braidotti, which refers, as one knows, to *A Cyborg Manifesto* by Donna Haraway. The scattered, unsubstantial, feeling subject as nomadic becoming will be confronted with the concepts of artists who use their corporeality and create projects that expand their sensory abilities.

It turns out that contemporary phenomenology proposes the concept of the subject, which fits perfectly into posthumanist practices and perhaps becomes a response to the challenges of the present, where the essentialist, substantial and attributive concept of the subject has ceased to play a role. Both post-phenomenological ideas and artistic projects in the field of cyborg art lead to the overcoming of binarity, in which thinking ends by defining subjects as belonging to one of two normatively non-equivalent opposites: man-animal, self-stranger, male-female, inside-outside, civilized-wild, rational-irrational, heterosexual-homosexual. Nevertheless, the post-phenomenological subject could be characterized at the intersection of these opposites. As Polish thinker Magdalena Środa suggests it in her book *Obcy, inny, wykluczony* (Stranger, different, excluded), this post-subject could be described by embodiment, affectivity and sexuality (Środa, 2020); its incorporation and disclosure would be artistic practices.

Let me begin by asking whether it is possible to find a common ground between post-phenomenology and post-humanism. The definition of post-phenomenology has been presented elsewhere (Murawska, 2020), so I shall only refer to authors who use this term with aims similar to my own, such as Francois-David Sebbah (Sebbah, 2001) or Pierre Rodrigo (Rodrigo, 2020). Unlike Don Ihde (Ihde, 1993, 2010), they attempt to radicalize and expand the field of phenomenology. They claim that post-phenomenology posits the radicalization of phenomenology, which would push it to its very limits, letting go of the phenomenon and their full presence and focusing instead on its elusiveness rather than its fullness or, to put it in Marion's terms, saturation (Marion, 2002). The subject, on the other hand, turns out to be not only embodied, but also dispersed in the world he/she experiences; this subjectivity is opaque and, ultimately, anti-essentialist.

Generally speaking, French post-phenomenologists perceive subjectivity as sensual and affective, haunted by the sensual fact and, paradoxically, formed in an act tantamount to its destruction and abolition. For it is the body that plays the main role in this sensual and hypertrophic haunting by the sensual.

Maldiney, whose conceptual tools are derived from psychopathology, follows in the footsteps of Maurice Merleau-Ponty, while persistently criticizing him. In his view, the embodied subject is being there (*être-le-là*), but its verticality allows it to be both "here"—in one specific place—and "there," when it moves elsewhere through sight. These ideas have been recurrent in phenomenology since its very inception: from Husserl, to Heidegger, to Nancy. Seen from this perspective, the embodied subject can, with the help of senses, expand the field of its experience. Communication with the world, which has yet to be "crystallized" into objects, does not allow us to experience a specific thing, or "what" appears, but we can experience "that" and "how" it appears as already Husserl had formulated it. As such, it is a painful and confusing experience that makes one feel that all foundations suddenly crumble. Maldiney associates this experience primarily with works of art. It is here in this experience that subjectivity is born (Maldiney, 2003).

The experience described by Maldiney, which forms the basis of our co-existence with the world, and whose paradigm is the experience of a work of art, turns out to distort, change and generate a crisis. This line of argument seems to be pursued also by Jean-Francois Lyotard, whose late writings, in particular those devoted to art, can be considered post-phenomenological.

In Lyotard's philosophy the subject is *in statu nascendi*, as the title of one of his papers states, is never created, is always becoming. The body does not exist for itself, but it is sensual only in so far as it is exposed to another thing, deprived of its own reticence when confronted with the risk of annihilation. It is sensual only when it becomes pathetic. The abyss of death drills into the body and deepens the experience. Art brings us closer to this abyss, yet without allowing us to sink into it. Lyotard describes our sensual condition and claims that our soul, the minimal and momentary *anima minima*, depends on it. Subjectivity is, according to Lyotard, a temporary state, dependent on stimulation, and it emerges only to immediately disappear. It remains in a state of becoming and disintegration. *Anima* only exists when forced to do so. The sound, the smell and the color bring out the pulse of feeling straight from this neutral continuum, from emptiness. It is art that allows *anima minima*, which also means the stimulation of the body, to exist (Lyotard, 1999).

In turn, Rosi Braidotti brings Gilles Deleuze and Felix Guattari's nomad to life and makes it a figuration of contemporary subjectivity, endowing it with gender. This is an important step, which makes it possible to emphasize the very feminine nomadism that, in many respects, differs from the masculine, owing mainly to cultural limitations (Braidotti, 2011). In this way, important issues of gender and culture, which are their weakest points, can be inserted into the reflection of phenomenologists.

What is important about her theory is that it seeks to rethink the deconstruction of the postmodern subject and to bring it back to life by giving it a more meaningful and active role, making subjectivity a new instrument of women's empowerment that can free the activity of thinking from the oppression of the phallocentric dogmatism, restoring to thought its freedom, its vividness, and its beauty. After the poststructuralist critique of the Cartesian rational subject as something questionable in today's world of wars and the mass extermination of the other, Braidotti takes the risk of reintroducing the category into philosophical thought; this is why I relate it to post-phenomenology, which has never abandoned the notion of the subject, but weakened it and transformed its understanding.

My aim, then, is to suggest that we search for a hybrid subject—a post-phenomenological subject that would also be close to Braidotti's nomadism, that would have a gender with all of its cultural contingencies. Paradoxically, while remaining within the field of phenomenology, I would like to go beyond and, ultimately, expand it.

I also wished to describe several young cyborg artists who strive to expand the field of art, and the field of their own corporeality, and thus the field of discourse that measures up to their experiences.[1] Atmospheric sensors have been installed inside Manel De Aguas's body. They allow him to sense changes in atmospheric pressure through impulses hitting his skull at different speeds. Joe Dekni has an echolocation sonar with two sensors installed in his cheeks. Kai Landre created a device that allowed him to hear cosmic rays. Rob Spence has a prosthetic eye that can act as a video camera. Pau Prats can perceive ultraviolet radiation and, finally, the sensor installed in Alex Garcia Durán's chest allows him to feel changes in air quality and levels of pollution.

One may ask how these new artistic actions that transgress bodily limitations fit into the discursive fields presented here. The answer is quite simple. It seems that artists' actions, just as the discourse of the thinkers I mentioned, are an attempt at a constant transgression and at describing/unveiling phenomena which, repressed by some, are slowly becoming part of our world. The artistic practices of cyborg artists are an attempt at transgressing the limitations of corporeality, but they also create a certain subjectivity that returns with a completely new face, thus far unknown. As these young artists experiment with their subjectivity, they are becoming unstable, nomadic subjects I referred to earlier.

Ultimately, still referring to Magdalena Środa whom I mentioned at the beginning of my contribution, I asked whether the subject described in this manner, who is nomadic, transgressive, deprived of stability, but also of clearly defined boundaries, who is a cyborg, will not lose his/her agency and become not so much a weakened subject, but simply too weak? In a world of crises and catastrophes, threatened by terrorism and pandemics, in which radical ideas seem to be gaining popularity and some communities are losing

[1] I do not refer to important artistic activities of Neil Harbison and Moon Ribbas, as they are known and have been described in detail.

their identity while others are hysterically trying to find it, shouldn't this new subject be strong enough to resist? As argued by Hannah Arendt, it was weakness and powerlessness, expressed as obedience and thoughtlessness, that led to the cataclysms of the 20th century.

Let us hope, however, that the subject crossing the border of subjectivity, crossing his or her own borders, will be able to learn lessons from the past, while constantly looking to the future and taking advantage of new technological possibilities. This multiform, nomadic, cyborg subject in process of becoming contains Maldiney's embodied affectivity and Lyotard's sensitivity.

This opens up the possibility of new relations between the human and the non-human, between the individual and the community, as subjectivity loses its substantiality but, at the same time, becomes more connected to and more aware of socio-cultural, economic and political phenomena, to technology, and more aware of the dangers that they entail.

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The Cyborg as an Anthropological Model: Philosophical Anthropology and the Problem of the Human Being in the Post-Biological Age

Dave O'Brien

Introduction

Philosophical Anthropology can be understood as an "intellectual tradition" or "school of thought," within which the findings of the human sciences are the explicit focus of philosophical engagement—it first emerged in the 1920s in German-speaking European countries (Brumlik, 2016, p. 112). Philosophical Anthropology can also be understood as a "philosophical paradigm" which is characterised and defined by the attempt to philosophically theorise the human via theorising biological life (Fischer, 2009, p. 153). The human being is both the subject and the object of Philosophical Anthropology. Our conscious mind is a primary concern, yet human "subjectivity" is not the starting point, rather it is the "factual existence of life"—which for the human being involves biological embodiment. Hence Philosophical Anthropology does not begin from "within" our physical bodies, instead, it critically "takes the distanced, biologist's view of the organism, of the living body in its medium or environment" as its initial point of departure (Fischer, 2009, p. 153).[1] Clearly, a philosophical approach that adopts this as its starting point, and then extends its scope to include all aspects of human concern, can provide solid theoretical grounds for the philosophical analysis and assessment of the concept of the cyborg.

Engaging with the philosophical anthropology of Max Scheler (1874–1928), this paper explores his claim that there is an inherent, problematic, and unresolved ambiguity surrounding the "idea" of the human being. The concept of the cyborg represents a challenge to established notions of human nature, how we understand the human/technology relationship, and—perhaps most challengingly—to what degree we should define ourselves through recourse to our biological heritage. Thus, the ambiguity that Scheler identified in the 1920s persists contemporaneously—in fact, it is encapsulated and intensified in the concept of the cyborg.

[1] Fischer differentiates between "philosophical anthropology" as a subdiscipline in philosophy and "Philosophical Anthropology" as a philosophical paradigm. The subdiscipline can be seen to be concerned with the systematising of historical philosophical anthropological thought, while the paradigm can be understood as being characterised by a particular approach to the concept of the human being. The paradigm includes Scheler, Plessner, Gehlen, Rothacker, and Portman. The subdiscipline is comparable to other subdisciplines of philosophy such as epistemology, metaphysics, or ethics, and the paradigm can be understood in the same way as other 20th Century approaches to philosophy such as Existentialism, Phenomenology, Structuralism etc.

Thus, as in Scheler's time, the "problem" of the human being remains an outstanding and unresolved issue. The notion that the human condition is something we experience problematically, and the way that the "idea" we have of ourselves plays a functional role in our historical development, is explored below through reference to some of the techno-scientific developments of late-modernity.

As our technology has developed it has become more and more entangled with ideas which were once considered strictly the preserve of our cultural imagination. Ideas surrounding the late-modern intensification and acceleration of the machine-human interface are now becoming science fact rather than simply science fiction. Ideas such as human enhancement and post-biological evolution which are most noticeably explored, championed, and popularised within the philosophy transhumanism, are moving more and more into the mainstream. These are ideas with which the image of the cyborg is intimately connected.

The cyborg is an already established and recognised image of the enhanced human being which is characterised by the merging of the organic with the synthetic. As an anthropological model, it represents the increasing intimacy and ubiquitousness of the human machine interface, which guides our way toward a horizon of techno-scientific promise and a possible post-biological and post-human future.

Philosophical Anthropology: The "Problem" of the Human Being

In 1928 German philosopher Max Scheler stated in *The Human Place in the Cosmos* that: "Ever since the awakening of my philosophical thinking, the question 'what is the human being and what is his place in being?' has occupied me more fundamentally than any other question I have dealt with" (Scheler, 2009, p. 5). This statement highlights the all-encompassing nature of the question of the human being for Scheler, and his later work on this, the foundational question of philosophical anthropology, was undertaken as an investigation into the "essence" and "essential" constitution of the human being. An investigation which was to be conducted in terms of an enquiry into the human being's relationship to "the realms of nature," i.e., organic, plant, and animal life, as well as our relationship to "the source of all things," i.e., being itself. Thus, Scheler identified and explored a variety of different concepts which had emerged at critical points in history, and which had become junctures in our historical understanding of ourselves. He also recognised that when these distinct conceptions of human nature were taken together, they tellingly lacked "any underlying unity" that might be capable of functioning as a "common foundation" upon which to build a universally accepted "idea" of ourselves (Scheler, 2009, p. 3).

In an essay dated two years previous, and entitled *Man and History*, Scheler established some context by stating that the "views concerning *the essence and origin of man*

have, at no other time, been less sure, less determinate, and more varied, than in our own" (original emphasis) (Scheler, 2009, p. 3). As a consequence of this, he went on to assert that in "approximately ten centuries of history, this is the first in which man finds himself completely and utterly 'problematic', in which he no longer knows what he is and simultaneously *knows that* he does not have an answer" (Scheler, 1958, p. 65).

An important insight of Scheler's was the recognition that the "concept" of the human being contains an inherent "tricky ambiguity"—an ambiguity which refers to the use of a universally accepted and recognised notion of the human understood as an "animal," and the simultaneous use—in everyday language—of the same basic term, but this time understood as something "totally different"—something which is completely "opposite" to the concept of animal in general (Scheler, 1958, p. 65). Hence, our very nature is experienced as problematic, and we are characterised by a "dual-aspect"—the human being is both natural and transcendental, both biological and socio-cultural.

One of the consequences of this dual-aspect that characterises our experience of being human, is that we are impelled always to ask about ourselves We are driven toward self-interpretation. As part of our way of being, we enquire into our nature and our place in the world—we must form opinions about ourselves. In response to this imperative, we construct and formulate concepts and ideas of who we are, and who we could—or should—be. These self-images accompany us in everything we do, and as a result, different historical epochs produce different images of the human being.

In broad terms, Philosophical Anthropology can be understood to have emerged initially as a response to Darwinism and the challenges to traditional concepts of the human being that the Darwinian revolution presented (Spahn, 2010, p. 136). Parallels can be drawn between this dynamic and our contemporary context, and—just as the original thinkers were responding to the Darwinian challenge to our self-understanding—Philosophical Anthropology can serve as a comparable rejoinder to Neo-Darwinism and the techno-scientific developments of late-modernity. For example, developments in biotechnology, AI, and nanotechnology etc., added to the emergence of new fields of research such as synthetic biology, have been accompanied by a radical reassessment of the human condition. A reassessment expressed in explicitly technological terms (de Mul, 2014, pp. 457–476).[2]

This late-modern reassessment of what it means to be human has found its most emphatic and unrestrained expression within the philosophy of transhumanism and its central claim that through technology the human being will be able to control the evolutionary process and transcend the limits of our current biological form. This reassessment of what it means to be human can also be seen to be reflected in the associated development and establishment of the cyborg as a potent, recognisable, and controversial cultural symbol.
As a cultural symbol, the cyborg not only straddles the border between science fiction

[2] de Mul uses Plessner's philosophy as the starting point for the development of what he calls "philosophical anthropology 2.0."

and science fact but stands also as a gatekeeper at the border of humanity itself. The very idea of the cyborg forces us to reflect on where we should draw the limits of the human being and how—as a biological species—we relate to our technology. It also brings into constant focus the question of how best to grasp the role technology plays in mediating our relationship to the world.

The image of the cyborg captures perfectly the way that the human condition is experienced problematically. The hybrid bio-mechanical character of the cyborg reflects the fact that human nature does not appear to be "fixed" in the same manner as it is for other non-human species. This lack of fixity represents a kind of existential sovereignty and the idea that we are essentially free to become what and who we are, or will be. Unlike other biological animals, we are free to create ourselves and make of ourselves what we will. Our dual-aspect means we are free to imagine ourselves in any way we can—hence, the knowledge that we have of ourselves has a direct effect on our being. Consequently, self-image plays a functional role in our historical development. This means that there is an intrinsic connection between the epochal self-images we produce and the concomitant shaping of our cultural and personal lives.

In this way, our self-image is a product of creative self-interpretation, where the concepts we produce of ourselves influence our historical development through a reciprocal effect on culture. The images which we see reflected back at us in our cultural creations tend make us want to be what we think we are by nature. This is because our self-image is a "necessary correlative" of—and plays a functional role in—our historical and cultural development and self-determination. The "idea" of the human being has a concrete retroactive impact on the "reality" of the human being (Landmann, 1974, 1985).

Our concept of ourselves works in such a way as to serve as a point of reference with which we attempt to correspond—our self-image is an ontological anchor that helps steady us as we try to orientate ourselves in the world. Hence, different historical paradigms generate a variety of images of the human being through which we try in different ways to explain and make sense of our existence. Humanity always operates with an accompanying theoretical self-image through which we are both constituted by and through—the cyborg is one such epochal human self-image.

As an anthropological model, and more than any previous historical self-image, the cyborg reflects the fact that we are both producers, and produced, by our cultural creations. The image of the cyborg captures the dynamic within which we simultaneously create ourselves as we create the cultural symbols which express who we think we are, or perhaps, could be. The cyborg is a self-image for the post-biological age. As such, it stands as a challenge to previous conceptions of human nature, and previous assumptions regarding where we draw the line that demarcates the organic and the synthetic. The image of the cyborg is inherently ambiguous, it might in fact represent the end of humanity, or indeed, in the same breath, it may also represent our future.

Post-Biological Evolution and Transhumanism: Transcending Biology through Engineering

Ultimately, the idea of the cyborg calls into question any notion of defining the human being simply and reductively in terms of our biology. It also brings into sharp focus the question of how we are to define the exact nature and character of the relationship between our biology and our technology. In a sense, our technology reflects our dual-aspect, it is both physical and intentional, it is constituted by inert matter yet it displays and is imbued with our intentions, objectives, and goals. It also reflects our imagination, creativity, and ability to reach beyond any notion of pre-set and fixed limits—biological or otherwise. Technology is how we extend ourselves into the world, in an evolutionary sense, it has compensated for our physical shortcomings and the instinct deficit of our biological heritage. Lacking in tooth and claw, we have always used technology—there is no such thing as the human outside of technology. This means that when we talk about human/technology relation, all traditionally assumed distinctions between what we should consider to be "natural" and what we should consider to be "artificial," could very easily be all but redundant.

This issue lies at the heart of the concept of post-biological evolution. The desirability, inevitability, and imminence of an evolutionary transition from the biological realm to the technological realm is a core tenet of the philosophy of transhumanism. As a philosophy of the human future, transhumanism is an amalgamation of the logic of evolution and the metaphor of mechanism, i.e., evolution is a fact; what has evolved will continue to evolve; technological developments promise greater and greater control over the physical mechanisms that underpin the evolutionary process; evolution will become a technologically mediated post-biological process. This is expressed as the idea of "designer" or "controlled" evolution—within which technology will allow us to engineer both the human condition, and the human future, and transcend the limits of our biological form.

Human beings have always had the capacity to exercise some degree of control over evolution. Human evolution has been the story of humanity "modifying" both ourselves and our physical environment and itself (Ćirković, 2018, p. 78) Now though, the expectation is that technology will allow us to progressively assert more and more control until we eventually achieve mastery over biological life itself. What were once biological processes will be transferred into the machine domain, and in this way, we will be able to assert complete and intentional control over our evolution. This is the key distinction between the idea of post-biological evolution and a traditional "Darwinian" understanding of evolution —it is human agency that guides the trajectory of the evolutionary process, rather than the "blind" mechanism of natural selection (Ćirković, 2018, p. 29).

Human agency and intention are defining factors of this notion of designer evolution, this serves then to reinforce the previous claim that the idea we have about ourselves plays

a functional and guiding role in our evolutionary development. Even if the vision of post-biology presented is indeed unlikely to become reality, the fact remains that—as far as know—the human being that is the first biological species to attempt to assume control of their own evolution. Even if this never even comes close to the level of intentional control envisioned by those who strive toward the post-biological and post-human future, this is not an inconsequential matter. With the human being, evolution, as both a biological and a cosmological phenomenon, has become a self-referential process. This in and of itself is profound. It is also almost unthinkable outside the context of our increasingly sophisticated technological developments and achievements.

On the most basic of levels, transhumanism is a philosophy of the human future—it attempts to offer a guide to the direction that our evolutionary trajectory might take. It is by necessity speculative, and its philosophy consists of extrapolating from the success and achievements of current and past technological developments, and then legitimising these extrapolations through recourse to the "fact" of evolution and the "fact" of our biology. It is predicated on an explicit re-imagining of human nature which is characterised by reflection on the potentially radical implications of the continued and on-going intensification of the human/technology relation, hence, the anthropological model of the cyborg can be seen as an essential and defining feature of both its philosophy and its vision of the post-biological future.

Engineering the Human Condition: The Cyborg as an Anthropological Model for the Post-Biological Age

Because it is engineering and technology from which transhumanism draws its inspiration, and from whose disciplines many of its most influential adherents originate from, we can view the attempt to apply engineering techniques and design principles to human nature as a practical extension of the theoretical attempt to reconceptualise and re-imagine the human condition in terms of the technological developments of late-modernity. As such, we can assess transhumanism in terms of a framework of Philosophical Anthropology.

As a philosophy and a cultural movement, transhumanism is committed to the endeavour of using technology to engineer the human condition, and to realise the human future as the post-human future. This vision of post-biological evolution represents epochal change beyond any previous historical human experience. Like the future itself, the post-human does not exist yet outside of our imaginations. Both are constructs—contextualised by the past, fabricated in the present, and projected into the future. This expectant stance toward a future that does not exist reflects the fact that our very existence poses a problem for us, and that we strain uneasily at the borders of our nature.

The imperative to address the foundational issue of Philosophical Anthropology means we are driven always toward self-interpretation. We are anticipatory beings,

orientated toward what is not yet there—both in ourselves, and in time—we must make of ourselves what we are. This dynamic is one which is only intensified by the "promise" of late-modern technology—which asserts that as the biological and the mechanical converge, and the natural and the synthetic amalgamate, the "problem" of the human being is in fact an engineering problem.

Ultimately, the very idea of post-biological evolution is the attempt to engineer the human condition and the human future. It also represents the perennial challenge to identify and define the border of humanity. The engineering perspective which is characteristic of transhumanism's vison of the future includes, as an essential part of it, the underlying belief that there exists a "techno-fix" which will provide a solution for all human problems—both present and future. As such, both the human condition and the human future become the object of engineering. The engineer is orientated in a practical sense toward what is not there—they do not seek to simply contemplate the world, rather they see what is missing and endeavour to build a solution.

Conclusion

As a merging of the biological, the mechanical, and the informatic—and now ubiquitous as a cultural symbol—the image of the cyborg has penetrated deeply into our cultural imagination—it is an anthropological model for the post-biological age. The image of the cyborg intrinsically embodies the notion that there may exist a fundamental equivalence between natural and artificial systems, hence, biology can successfully be subject to engineering principles and design-based processes, and any ontological gap between human and machine can ultimately be collapsed. The idea that we are free to make of ourselves what we will, has thus become a "practical" concern—an engineering problem to which the cyborg is the solution.

Reflection on the nature of our technology inherently involves reflecting on some of the most important questions we ask about ourselves. The question of technology is an issue of Philosophical Anthropology. The image of the cyborg represents how we use technology to extend ourselves into the world – both organic and cognitive extension. This has always been the case, just as there is no such thing as the human outside of culture, there is no such thing as the human outside of technology. We are technological beings—always already technical—and the human condition is technologically mediated. Our technology serves as a bridge between us and the world, and this is only reinforced, emphasised, and further intensified with the techno-scientific developments of late-modernity.

The cyborg as an anthropological model reveals that the "idea" we now have of the human being includes within it the notion that—through the application of technology—we might be able to exert full and precise control over our biological heritage. The concept of cyborg was originally a thought experiment conceptualizing ways for the human being

to survive the hostile environment of space (Clynes, Kline, 1960). Thus, in its original conception the idea of the cyborg the represents an engineered solution to the frailty of human biological body, i.e., the cyborg is an engineering solution to the outstanding problem of the human being.

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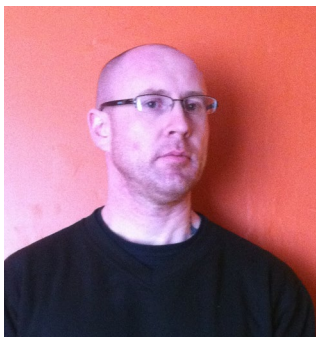

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Should We All Become Moral Cosmic Cyborgs?

Bartosz Pokorski

Introduction

I shall start my contribution with an array of theses to be briefly analyzed below. While they are aimed at outlining the issues that have recently become the key aspects of the cyborg-debate, they by no mean are to provide true and definite answers. My goal is far more modest: to change the debate-optics, to make a shift in its perspective, and to change the emphasis of a question: from what we actually are to what we actually need.

Thesis 1: The only thing that is certain is that we will die, and mortality marks the ultimate perspective of consideration.
Thesis 2: There is some ambiguity when it comes to using the term cyborg and, regardless of the understanding, it would be best if it were considered in relations to cosmic space.
Thesis 3: Technology is blazing new trails and changing our future but ethical questions are reflexively changing our past so they can take us in a new direction.
Thesis 4: Moral persons have obligations and one of them might be to undergo cyborgization.
Thesis 5: The circumvention of mortality can be achieved through a revolutionary viewpoint. The naturocentric viewpoint should be replaced by a cosmocentric viewpoint, which will help determine the ex-sistence of persons and, perhaps, help determine the conditions of survival.

Why We Should Move from Nature to Cosmos to Save Ourselves from Extinction

Our existence on Earth (and in general) is increasingly no longer unproblematic. The above questions, I think, are another step in answering the question of what to do in the face of the fact that (I) we are all going to die. Surely our time on this earth is finite but might we be facing the end of the human species? This question can be understood at least in two ways: (II) we (humans) as a species will become obsolete and give way to a new, possibly better, species or (III) we might go extinct altogether due to disastrous consequences we have contributed to on Earth.

Below are five working theses which I hope will seem to someone worth considering, and which somehow relate to the questions I am asking. A manifesto is a form of making

certain theses publicly discussable and open for revision. However, alongside with *mannerism* and *manuscript*, a *manifesto* retains its root referring to the hand (lat. *manus*)—the individual style of the writer. I hope that both dimensions—public discussion and individualism—will find a place in humanity's future, if it has one.

Thesis 1: *The only thing that is certain is that we will die, and mortality marks the ultimate perspective of consideration*.
Our mortality can be considered in at least three ways:
(I) in terms of the finiteness of individual life, mortality can lead us to ask what we would (and perhaps should) do in a finite lifetime and how we should relate to other mortal beings;
(II) from an evolutionary point of view, whether we like it or not, there are certain changes, however slow they may be, to which the human species as a whole is subjected, as a result of which one day there will be no representatives of *Homo sapiens*, just as there are no representatives of *australopiths* today, irrespective of whether (a) some, out of a conservative fear of changing the current *status quo*, prefer not to engage actively in this change or to forget about it, or whether (b) some promote projects such as transhumanism, posthumanism or cyborgization, according to which, on an individual level, they try to manage this change;
(III) the reign of the human species on earth may come to an abrupt end for no less "natural" reason—as a result of a global cataclysm, pandemic or other catastrophe—than changes that improve its functioning, which for some time now, both as individuals, as a species and as a force of nature (as reflected in the new geological epoch—the anthropocene), we have been able to influence. We may all, like the dodo or the sabre-toothed cat, become extinct.
The third perspective presents a scenario that, unless we are extreme antinativists, must be defended against. If we were to protect some value that have germinated on the ground of human activity, some combination of the (I) first and (II) second perspective could be significant. Perhaps the ability to value is itself a value worthy of preservation regardless of species and around this issue our moral deliberations and collective actions can revolve. Quite shockingly I think that the notions of a moral person, a cyborg and a cosmos are helpful for this purpose.

Thesis 2: *There is some ambiguity when it comes to using the term cyborg and, regardless of the understanding, it would be best if it were considered in relations to cosmic space*.
I agree with the view voiced during the conference by Monika Michałowska, who said that just as we can have different definitions, conceptualizations of the notion of the "person," we may as well have different definitions of the term "cyborg." For it is not yet clear whether, as Neil Harbisson claims (2017), we are all becoming cyborgs (will cyborgs replace humans or will we live with each other side by side?). Manferd Clynes claims that someone riding a

bike is a cyborg (Gray, 1996). Steve Mann, during his conference presentation, took a step further to state that since a man on a bicycle is a cyborg and a man in a vessel is a cyborg, than cyborgs have been around for thousands of years (see in this volume, Mann 2022). Donna Haraway (1991) presents a broader account of cyborg theory, obviously in a feminist context, rather as a myth or conceptual apparatus relating to identity, social or political phenomena and to a somewhat lesser extent to technological/engineering issues.
Perhaps we can suggest three accounts of a cyborg:
(1) cyborg as a notion and a part of a symbolic framework that describes certain phenomena in terms of cyborgization;
(2) cyborg as an imaginary category, which is useful for defining the identity of particular individuals (e.g., for those who fight for cyborg rights for themselves), as well as being connected with various phantasmatic visions of possible futures of people or crossing certain borders (as in science-fiction);
(3) cyborg as a term for what, according to the historically first definition of cyborg, denotes a system that is a permanent and durable combination of a protein organism with a certain technical device that enables it to function better in a given environment (in this sense we might consider whether in the same sense a man with a smartphone in his hand, a person with a pacemaker and Neil Harbisson will be a cyborg).

In this study, I will focus on some combination of (1) the first understanding and (3) the third. When considering the term, it is good to begin with the meaning given by the creators of the word we use. The term itself comes from the paper authored by Manfred E. Clynes and Nathan S. Kline, entitled *Cyborgs and Space* (1960). The authors discuss the possibility of human survival in inhospitable cosmic conditions, i.e., extending the self-regulatory functions of the organism.

This combination of machine and human—the cyborg as a system—is one that closely resembles the human organism, but with restored function or enhanced abilities through the integration of some artificial component or technology, which may rely on some kind of feedback. This feedback can go both ways. It can mediate, on the one hand, between the organic body and extra apparatus, and on the other hand, between the cyborg and the environment to which it would adapt. There is a constant mediation between the systems that would keep the balance. The cyborgization comes into handy when an organism encounters a foreign and/or hostile environment, such as cosmic space. Cyborgs, by definition, live outside of their field of operation but are designed to be adapted to this new and incompatible field.

What is the purpose of a cyborg? Human-machine fusion is to facilitate the functioning of the subject in a given environment. Authors present us a thesis that a cyborg frees a human to explore. We just need to find the devices necessary for creating self-regulating systems. As it seems, today's technology—human-machine interface, biochips,

nootropics—can further facilitate human life in a given environment, its own cosmos. We can perceive the interface in terms of something concrete and look at cyborgs as e.g., Human-Computer Interface, but we can perceive this interface more abstractly: as an intersection of two or more centers between which there is feedback and which enables autonomy in relation to some other centers. In this sense, two centers—the body and the machine—enable independence from another center—the cosmos—although some feedback is possible between them all.

Although it is very important which type of intersection we are dealing with (whether it will be surveillance, sousrveillance, uberveillance or unterveillance, see Mann's contribution in this volume for more), what is interesting is the conceptual possibility of the existence of a certain relation. It is about a relatively permanent link between two structures that increases their autonomy as a system and makes them more independent, freer, in relation to some other structure, even though they may be exchanging information with each other.

While the limits of the possibilities of future intersections are set thanks to technological advances and are rather related to questions of bioengineering, cyborgization as increasing the freedom of organisms leads us to pose an ethical question.

Thesis 3: *Technology is blazing new trails and changing our future but ethical questions are reflexively changing our past so they can take us in a new direction*.

The resolutions of ethics are very often untimely. The progress and development of technological possibilities is much faster than the breathless humanities chasing after it. The latter, by its very nature, is more reflective and better equipped to describe what has already occurred. Just as technology is able to actively change the future, so, for example, ethical reflection, by marking backwards is able to change the past—to change the understanding of what we did, what we are doing and what it is right to do next. This type of afterwardsness, retroactive labelling is often used by John Harris (2007).

The question of cyborgization is a question of improving certain functions, and is therefore a question of enhancement. Harris provides a very general and perhaps therefore operationally useful definition of enhancement. He states that an enhancement is something that makes us "better at doing some of the things we want to do" and enhancements "do good, and make us better people" (Harris, 2007, p. 2). The author does not specify what this would be—is it an internal or an external change, permanent or impermanent increase of capacities, invasive or non-invasive improvement? The essence of enhancements is that they are changes that are simply improvements on what went before and "if it wasn't good for you, it wouldn't be enhancement" (Harris, 2007, p. 9) From this perspective, Harris claims, we have a moral responsibility to make responsible, informed choices about ourselves and the destiny of the world in which we live. Morally, we have to take control

of "evolution (...) to the point (...), where we (...) will have changed (...) into a better species altogether." (Harris, 2007, pp. 4–5) We have a moral obligation to enhance.

How can we know if something is really good or not? A decision involving the choice of what will be for us or for someone an enhancement must involve some kind of deliberation, and in itself requires a moral judgement if we were to be obliged to enhance. This good must be in our best interest and the best all things considered (Harris, 2016). It is in our best interests not to suffer, so any good change must not involve at least significant additional suffering. Furthermore, doing something, some good deeds, may be good in themselves, but may not be good, considering all things. In short, we ought to aim at what is the best possible. These are the basic conditions for determining whether a certain change can be resolved as enhancement or not.

According to this theory, sending children to school, vaccinating oneself, doping, certain forms of neurobioenhancement, and some forms of cyborgization are all equally enhancements (if they are indeed such), regardless of the degree of "interference with human nature" that bioconservatives warn against. From this point of view, this enigmatic "nature" itself is irrelevant if there is some state that is better than the state of nature. If such a better state is possible, we have a moral obligation to strive for it. We have a moral obligation to enhance.

But what or who is the one we ought to enhance and whose best interest we ought to take into account? Reflecting on what makes life, including human life, valuable, Harris tries to develop a suitably versatile, non-anthropocentric, species-neutral conception in order to answer the question when life begins to matter morally.

Thesis 4: *Moral persons have obligations and one of them might be to undergo cyborgization*. A person is a being that matters morally whose interests and good we ought to take into account. A person is any self-aware being capable of valuing his own existence. For Harris "language is the hallmark of self-consciousness" (Harris, 1985, p. 19) so a person is also a speaking being of some sorts and in a sense, through the use of language we can identify persons (one of the great challenges of modern science is the question of identifying all persons, their rights and obligations). A self-reflective and self-conscious being that values its life matters morally and is a moral agent whether or not it belongs to the human species or any other. In this sense, starting from a very broad definition of a person, it does not matter whether one is human, cyborg, alien, or another form of highly organized intelligence. Although representatives of *Homo sapiens* differ in their abilities from certain representatives of other species that we would consider non-human persons, there is no need for separate rights for persons who are at a similar level of cognitive function.

The concept of a person seems to be operationally useful, because it makes it possible to define some basic rights for different beings—e.g., having an interest not to interrupt

existence, an interest not to suffer, morphological freedom, etc.—and, being quite general, takes into account many beings yet unknown to us (extraterrestrials we may meet or future possible human-machine combinations). It does not require the introduction of separate rights, such as cyborg rights.

Therefore, if we turn to the classic concepts that cyborg activists deal with today—freedom, autonomy or rights—we can look at them from a different perspective:
(a) freedom can be understood as the freedom to explore, which only cyborgization in a given environment, a given cosmos enables;
(b) autonomy (apart from the Greek root meaning the ability to grant rights to oneself) is a certain independence from the environment, but also some contact with it and the ability to define one's attitude towards the cosmos;
(c) rights may be considered not as privileges dependent on the percentage of protein composition, species or morphology, but related to personhood—an ambiguous concept and difficult to ascribe to some beings, but nevertheless opening up to possible, unknown future beings

However, on the other hand, seeing personhood as a condition for freedom, having rights to make bodily changes at will tends to imply a pejorative sense of privilege. A person as a morally significant subject is one toward whom other persons have obligations, but also one who is obligated to others as well as to himself. From this point of view, following Harris, we can ask whether all change, all cyborgization will be morally good, will be enhancement.

A person is not only a moral patient but also, and primarily a moral agent—the one that ought to act morally. In this sense a moral person has duties and one of them is to enhance. Cyborgization is also a form of enhancement so—in a broad sense as adapting to the conditions of the environment, which adaptation will be the best all things considered—we have a duty to cyborgize. Further, if cyborgization is our responsibility, then that responsibility also includes the specific way of deciding what type of interface, self-regulating system will be appropriate for a given environment. Can we use a mental shortcut? Part of deciding our moral duty is to take the environment into account, to make a certain cosmos a point of reference.

Thesis 5: *The circumvention of mortality can be achieved through a revolutionary viewpoint. The naturocentric viewpoint should be replaced by a cosmocentric viewpoint, which will help determine the ex-sistence of persons and, perhaps, help determine the conditions of survival.*
In the classical understanding of the term *cosmos* (κόσμος) it is the harmonic order of the universe. From the primordial principle of all things, to contemporary visions the universe is the definitive and external point of reference, no matter if is viewed as harmonic, chaotic, peaceful or hostile. It is up to us to interpret the hostility of the cosmos and guide our development.

There seems to be a conceptual advantage of cosmos over nature as a reference point in ethical debate. Some bioconservatives oppose the notion of enhancement, claiming that it involves a hubristic transgression of nature (Sandel, 2007), and that we poke too closely at the X factor associated with human dignity (Fukuyama, 2002). In his ethical thought, John Harris shows that not only is it our moral duty as to future actions to improve, he also shows that we have always done so (Harris, 2007). Teaching children to speak and write (language is an example of enhancement technology), vaccinating ourselves (giving ourselves some form of immunization against environmental externalities), dressing ourselves (perhaps in a spacesuit) and certain bioengineering procedures are all considered equally from a moral point of view—as being in our best interests and the best all things considered—and human nature is irrelevant in these considerations.

In the same way that the concept of enhancement changes the meaning of our past actions—with enhancement technologies we have always improved ourselves, a good example of which is the idea of practical philosophy—and sets new directions, because we have always improved ourselves, it makes no sense to separate therapy and enhancement, because both are aimed at the good of the person —in the same way the concept of cosmos can change the meaning of the human being not as a being of a certain nature but as a being interacting with a certain environment. This small change in optics, a shift in perspective, can change the emphasis in our questioning of ourselves: from what we actually are, to what we actually need.

And we need something, since, according to perspective III mentioned at the beginning, we have something to fear. We can fear not the loss of nature—a mere conceptual elaboration—but the loss of human beings as persons who value their lives. For I would argue that mortality marks the ultimate perspective of consideration and our survival depends not on our nature but on the cosmos in which we levitate—even if we are partly the authors of that cosmos—so we need to start considering things, so to speak, from the other side, or perhaps from the side of outer space.

Concluding Remarks

Which definition of cyborg or which understanding (1, 2, or 3) of the term is the right one? It is hard to say. If mortality determines the ultimate perspective of considerations, we will be interested in such a practical definition of cyborg, thanks to which we will know how to save moral persons from annihilation and what actions moral persons must take to avoid annihilation. Technological solutions alone will not suffice for this. It seems that a proper definition of the person, his or her rights and duties, his or her relation to the environment, which involves asking ethical questions, will make it possible to change the past and set new directions for change.

I think, first of all, that the change of perspective from naturocentric to cosmocentric (as once from geocentric to heliocentric) is necessary to be able to take a different point of view at all. What is human and our existence can be conceptually replaced by ex-sistence, by existence from the outside, since a certain essence will no longer be located inside but rather outside. This is not a new thought, and its revolutionary nature is linked to the subversion of the way we look at ourselves—from the cosmic point of view.

I see this idea as an answer or a proposal in the dispute between bioconservatives and bioliberals, that is, in the dispute over the acceptability of modifying or improving the human condition. I would like the perspective I am proposing to be obvious—something easy to accept that lies right in front of us, and that can change the way we look at the issue—rather than trivial or banal. I am aiming for a certain parallax, for looking at the issue of the changes to which human beings are subjected from a different point of view. A lot of conceptual work still needs to be done here. If the notion of the cyborg includes the notion of organism and technology, it would be necessary to better define what this technology is (whether it is material or immaterial means, such as language), how to set boundaries between the cyborg and the environment (whether one's own body or some object within it can also be treated as the environment or not), who and in relation to whom and to what extent decisions can be made regarding which cyborgizations will be enhancements, etc. This perspective does not invalidate old questions about freedom (including morphological freedom), moral obligations, the purpose of life, or the intervention of governmental institutions. It merely proposes a change in the optics of the debate.

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Cyborg or Cyb.not? An Ethical Analysis of Technoscientific Cyberology

Fiorela Prenga

Abstract

The modalities of techno-scientific cyberology within the modern treaty cross the postmodern systems of knowledge-power. New digital and biogenetic technologies such as virtual reality, artificial intelligence, genetic modification and technological prosthetics, signal a post-human future in which the boundaries between humanity, technology and nature have become ever more malleable. The rationality of intelligent agents, the intelligent robots and the excesses of its genetic enhancement compose, among other things, the portrait of the new world biopolitics and political economy of hope for a life that will be "free" from vulnerability, disease, "dangerous social activities," death, etc. In these contexts, manifestations of the biopolitical techno- scientific interfaces of laboratories and society are traced, starting with genome modification through CRISPR and biobanks, continuing within the social, with an emphasis on iDNA. "23andMe societies" and the "pathological genome." Will cyborgs, as posthumans, become humans in a Nietzschean way (Nietzsche, Übermensch)? What are the potential impacts on the moral acts and the moral agents? Who will the new cyberology be for? Through the Kantian notion of autonomy, freedom, and humanity I make a philosophical and ethical analysis of the impact of the new cyber reality that permeates ethics and existing values.

Introduction

The expansion of artificial intelligence and neural networks, genetic engineering and biotechnology, enhancing technologies for human senses, environmental design techniques, and automated algorithmic systems, have productively intervened with the restructuring of the world and our interaction with it. Nowadays, modern forms of hierarchy and power relations are evolving into the capabilities of digital media, creating in turn a new example of policy: real-time surveillance, algorithmic management and information production, naming of diversity, creating post-truth regimes. New digital and biogenetic technologies such as virtual reality, artificial intelligence, genetic modification and technological prosthetics, mark a post-human future in which the boundaries between humanity, technology and nature have become even more malleable. The rationality of intelligent agents, the "intelligent" robots and the excesses of its genetic enhancement, among other

things, compose the portrait of the new world biopolitics and political economy of hope for a life that will be "free" from vulnerabilities, diseases, "dangerous social activities" or even death. People are not just surrounded by information and communication technologies, but they are embedded within them. What are the potential impacts on the moral act and the moral agents? Through the Kantian notion of autonomy, freedom and humanity, I make a philosophical and ethical analysis of the impact of the new cyber reality that permeates ethics and existing values.

The Space of Cyberology

AI technology has been invented as the augmented intelligence for humanity. However, over time, the goal has shifted to the invention of autonomous agents that can mimic human ethical decision-making processes without any human intervention. There is a need for the sociocultural framework of the view of technology and science, which is the background of technology. This framework presupposes, first of all, the analysis of the historical and socio-cultural characteristics of the nature of technology and science, including the current situation. Technology, as a system of functions, that transforms or preserves the object of activity, should be examined and applied in an inseparable and distinct unit with the methodology as an organizational activity of the subject and should be examined and applied with evaluation, which aims to find criteria for selection and evaluation of values (Mishatkina & Falko, 2019, p. 1294). The new reality of cyber society brings an era of multiple transformations, which affects ethics and politics in various ways. Post-human pulses, smart cities, "intelligent" robots, and home appliances are mixing to accelerate targets, at an increasing rate. Cities are turning into techno-societies, where people, instead of thoughts, exchange infected cutting- edge software and now everything is encrypted.

Focusing, for example, on biogenetic technologies and genetic modification, we can see how the interaction of the power of genetic knowledge with the power of technology creates a new kind of subject, where self-responsibility implies both "physical" and "genetic" responsibility. People have always been responsible for the health-disease state of their body, but now they need to know how to manage the consequences of their own genome through the space of cyberology, which leads to a biopolitical situation. This state of geneticization belongs to the context of biomedicine, structuring the needs and obligations, through narratives, images and fantasies, where they are established in the social space. Through this post-genetic transformation, we must deconstruct the expanding socio-technical landscapes and understand genes as products that take on social meanings (ten Have, 2001, p. 296).

Artificial intelligence and cyber systems like this are not abstract concepts that are far removed from us. Artificial intelligence is deeply rooted in this planet, reflecting its neoliberal system (Hagendorf, 2020, p. 106–109). The belief that human intelligence can

be improved or even replaced has been considered by many to be an axiom. We think of artificial intelligence as a kind of brain, but artificial intelligence is a deeply closed and deterministic system that cannot be equated with the human brain.

Ethics in the Space of Cyberology

As artificial intelligence and cybernetics systems advance, bioethics must be adapted to address systems problems, and systems development must be reviewed to incorporate bioethics. Increasing acceptance and reliance on technological corrections, such as implantable cardiac defibrillators (ICDs), are a feature of current medical systems and treatment regimes. Going forward, people who live life with their devices in their hybrid bodies are what we call cyborgs (Haddow, 2021). These technologies must be filtered by bioethical principles. Incorporating bioethical principles into the design process could help protect human rights, minimize patient risks, create accountability for AI system operators based on machine learning, and establish robust measurements to study effectiveness and benefit (Nabi, 2018, p. 11). Also, with the contribution of bioethics, the lack of clarity about the kind of ethical logic that these systems can and should use needs to be redefined to reflect the values that need to be embedded in them. For example, the principles of justice, equality, explainability, and the confidentiality of information and privacy should be given high priority. People are agents of act and recipients of actions. Through ethics, what must be maintained are subjects who act freely. Ethical obligations exist where there is the capacity for action and reasoning around actions. People are morally distinctive because they are agents and therefore subjects to a moral obligation that determines how they should act.

Creating different types of cyborgs carries different potentials for the individual not only for a kind of possible malfunction, but also for the proper functioning of technology, the body position where it was implanted, the reasons why it was implanted, the type of technology and patients' expectations for benefits. We are embodied and the relationship between body image, integrity and identity is a self-evident experience and rarely a source of reflection. The cyborg is uniquely embodied as a hybrid of government and organization and there are multiple layers of vulnerabilities associated with the new state of the body that need to be considered (Haddow, 2021).

A human being qua rational being has free will, which is an ability that results in the ability to exercise moral judgment. Free will must be maintained in a cybernetic state of government. Free will is nothing other than practical reason. Failure to maintain it means that there will be no free moral subjects. Humanity is morally accountable, precisely because there is a choice, but to choose wisely, rational beings must exercise what Kant calls the autonomy of the will, which is the only principle of all moral laws and duties in keeping with them.

Freedom of will can be nothing more than moral autonomy. As Kant puts it:

> Freedom in the practical sense is the independence of the power of choice from the need for impulses of sensibility. (...) The human power of choice is indeed an arbitrium sensitivum, yet not brutum, but liberum, because sensibility does not render its action necessary, but in the human being there is a faculty of determining oneself from oneself, independently of necessitation by sensible impulses.
>
> (Kant, 2015, CPrR A534/B562)

Practical freedom is necessarily equivalent to the realization of Kantian autonomy, specifically, "The moral law expresses nothing other than the autonomy of pure practical reason, that is, [practical] freedom" (Kant, 2015, CPrR AA 5, p. 33).

Some AI scientists have argued that a Kantian machine will be a perfect example of a performer who can unbiasedly follow the "duty." It will be devoid of emotional biases like biological beings. However, all this does not sound coherent with the Kantian moral action performed by the "freedom of will" and necessitated by categorical imperative (Manna & Nath, 2021, p. 146). The categorical imperative is the unconditional command, which is an end in itself, and one should follow it to perform one's own duty. In Kant's words "So act as if the maxim of your action were to become through your will a universal law of nature" (Kant, 1998, Gr. 52/421). Continuing, Kant says "So act that you use humanity, whether in your own person or that of another, always at the same time as an end, never merely as a means" (Kant, 1998, Gr. 429). A paraphrase of the principle is as follows: never use others as means to an end; always treat them as ends in themselves. In other words, treat everyone else with respect and dignity, concepts that should not be perished in a cyber context.

Autonomy, or self-government, in the Kantian context, is essential to achieving and maintaining freedom from the standpoint of all. In his *Lecture on Ethics*, Kant equates the greatest use of freedom with the highest principium of life. The full use of life is freedom (Guyer, 2005, p. 116). Humans and cyborgs exist in a continuum in which subjects must remain ends and experience freedom. Freedom consists in this, that everyone can act according to his own will, without having to act according to the others will, escaping heteronomy by setting ourselves and other people as ends. All possible action options are related to our practical world, which is completely connected to our embodied existence in the world. As I mentioned above, we are embodied and the relationship between body image, integrity and identity is fundamental. Kant declares in *Lecture on Ethics* that

> our bodies belong to ourselves, and are subject to the general laws of freedom whereby duties are incumbent on us. The body is entrusted to us, and our duty in regard to it is that the human mind should first of all discipline the body, and then take care of it.
>
> (Kant, 1997, 27:379, p. 151)

Only through freedom can the subject fulfill the duty that has towards himself/herself for the cultivation (cultura) of his/her physical forces (spiritual, mental, physical) which is a command of the moral practical reason. Specifically,

> [t]he body is the total condition of life, so that we have no other concept of our existence save that mediated by our body, and since the use of our freedom is possible only through the body, we see that the body constitutes a part of our self.
>
> (Kant, 1997, 27:369, p. 144)

Conclusion

In conclusion, a cyborg is a cybernetic organism, a hybrid of machine and organism, a creature of social reality. Social reality is lived social relations, our most important political construction, a world-changing fiction. Cyborg is a challenge for us to accept that we are responsible for the concepts we have made for who and what we are and that in our time, a mythic time, "we are all chimeras, theorized and fabricated hybrids of machine and organism" (Haraway, 1991, p. 149). In the space of cyberology as long as the boundaries blur what must be maintained are subjects who can act differently, who can act freely. Technology is not a neutral concept, but it is a socially identifiable category and as such must be analyzed. Haraway argues that the focus about cyborgs is not solely on the technology itself, but on the socially structured relationships between people that have been created historically (Haddow, 2021). As Haraway says, "we are all cyborgs" (Haraway, 1991, p. 150). It is time to draw attention to who the "we" are.

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Cyborgs Outsmarting Attention and Philosophical Implications

Martina Todaro

Key Points

• The first big step toward transhumanism has been taken when we started using technology, art, fashion, science, and medicine to interfere with our attention.
• Attention is intended here as the process behind the "Awareness-Interestedness" feedback loop, and it is deeply interconnected with freedom and consciousness. The Attention-process ranks and selects what is relevant by comparing new stimuli with those judged interesting previously. If attention is the ability to select some input while ignoring others, then the brain acts like a spam detector.
• New technologies, such as Virtual Reality and those deriving from the fields of Artificial Intelligence (AI) and Big Data, undermine human's autonomy by short-circuiting users' ability to focus on (or be distracted by) external stimuli. AI applications are used to rank and select what is relevant mostly. Search Engines, Virtual Assistants, and Social Networks are attention-influencing techniques.
• The relevant question here is not "if" we should delegate control over our attention, but "how much" of it we are willing to delegate.

Introduction

As we found a way to outsmart memory with technology (e.g., writing), we are willing to find a way to outsmart attention (conveniently). We have not found a way to properly enhance our brains to have a better memory yet: our brains evolved to let us memorize what has always been sufficient for survival. Although, it is possible to train memory, human performance is still limited in a very short range of information storing capacity compared to the number of written documents. With this in mind, I use the verb "to outsmart" to imply a desirable change (effect) in human abilities that does not require the modification of any biological traits (cause). We are not able to fly, yet we can fly tolerably close to our arbitrarily chosen destination if we want to. Is this sufficient to make us cyborgs?

The ongoing debate on whether a cyborg must have artificial implants, or it is sufficient for us to wear clothes to consider ourselves cyborgs, is one of the reasons why I use the word "outsmarting" instead of the more common word "enhancing." To better clarify my position on the matter I will use Andy Clark's interpretation of the human-technology symbionts: "thinking and reasoning systems whose minds and selves are spread across biological brain

and nonbiological circuitry" (Clark, 2003, p. 3). The definition above matches perfectly with the memory example: an external device is needed to store information even if this implies new abilities: writing and reading. Not so straightforward within the attention framework.

The attention's bottleneck allows us to focus on very little information at the same time and this is a problem. Not only because our performances are limited by the short attentive span, but, most importantly, because distraction is one of the main causes of preventable death and injuries. Technology may one day give us the chance to produce one or more digital twins able to help or fully replace individuals in boring, hard, or dangerous tasks without direct control. Moreover, having limited cognitive processing resources means having to choose carefully what deserves attention. This is an evolutionary problem that intertwines with free will: if we have free will, then we can direct our attention to whatsoever source of information we choose. And here is another issue: we cannot consciously decide not to be distracted by annoying stimuli or warning signs unless we isolate and prevent the stimuli occurrence in the first place. At the same time, we trick what we may call our (and others) "natural alerting system" every day, by setting our clock-alarms, wearing flashy or anonymous clothes, changing the position of the pills so that the next day it is impossible to forget to take them. Various techniques are used in Marketing and Advertising. The AIDA (Attention-Interest-Desire-Action) model encompasses well-known marketing strategies to bring subjects from the state of being unaware of a particular product's existence, to the state of consumer of that product.

In summary, we can group the problems of attention in two categories: efficiency and efficacy problems, and we seem to be very good at tricking our own and others attention. Regarding attention, crossing human borders would mean overcoming the efficiency and efficacy limits by:

• restoring, enhancing, or outsmarting our ability to remain focused on what we freely choose is worth following or pursuing (liberating higher levels of awareness and freedom);
• reducing false negatives (highlighting or amplifying signals of true dangers that our brain would ignore);
• reducing false positives (city noises, pain, annoying advertising, distractions that our brain would consider dangerous or worth considering at least);
• restoring, enhancing, or outsmarting multitasking.

Human enhancement is beyond the therapy threshold (restoring functions), but the concept of "enablement" may solve the debate over "therapy" versus "enhancement." Enablement has to do with opportunities. It refers to the emergence of new and hard to predict properties in complex systems. Writing is not the way we outsmarted individuals' memory only, it also turned out to be enabling for the whole species. Leaving prehistory and entering history, we changed our relationship with time, formed traditions, tied generations together. Can we predict or anticipate the opportunities (morally good or bad) we enable as a species once we could outsmart attention?

Attention

According to William James, attention is the ability to select some input and give it deeper processing, while ignoring irrelevant inputs (James, 1983). Generally, we consider two types of attention:

• Endogenous attention, the top-down volitional control over our attention. Eventually, it is the kind of attention linked to free will. Visual endogenous attention allows us to monitor, select, and track some objects, over others that are either not so processed, or that are actively ignored. Visual attention empathizes mostly the form, color, motion of the object. Typically, paying attention, and releasing acetylcholine into a synapse, results in changes in neural firing dynamics, most commonly an increase in neural firing rate (Treue, 1996).

• Exogenous attention, which is stimulus-driven, so not subject to volitional control (Sanefuji et al., 2016). Pain, noises, blinking lights, strong smells, unexpected tastes, bumps, or even unusual tactile sensations grab our attention whether we like it or not.

The problem with exogenous attention is that it highlights highly disordered, uncommon patterns. In a consensus looking network society, where grabbing attention is crucial and being interesting is valuable, the usual information flow is becoming scattered, impulsive, and compulsive. And this produces anxiety.

The Awareness-Interestedness Cycle

If attention is the ability to select some input while ignoring others, then the brain acts like a spam detector. It is an implicit connection to Artificial Intelligence. Our e-mail accounts' spam detectors are machine learning algorithms that use statistics in a convenient fashion. Whether AI reached a superhuman level in filtering and ranking content or not, is a secondary problem. We delegate those tasks to machines, because accomplishing them requires a significant amount of time and effort. Outsmarting attention is not necessarily a matter of quality, yet it could be necessary for making sense of the overwhelming quantity of information we receive (efficacy problem).

Who decides what is relevant and, maybe most importantly, what is not? Arguably, we do, more or less intentionally, or we delegate others. Others rely on our preferences too, but with a strategical insertion of sponsored content. This may be the cost of such an apparatus (Fig. 1). We make decisions on our knowledge base and today, we build such knowledge base on the web mostly.

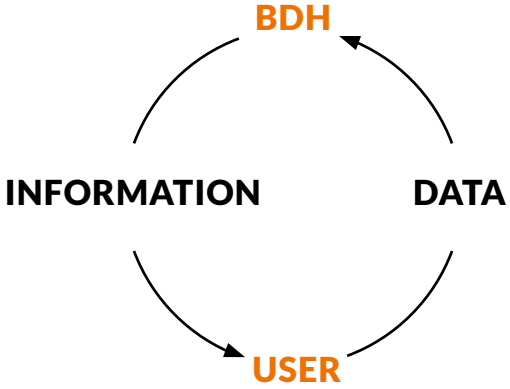

Figure 1: The BDHs (Big Data Holders) Loop. BDHs provide personalized information based on users' behavior (data). Information relies often into the order in which data and other information are displayed to the users. The process of ranking information is influenced by sponsored contents.

Let us assume "we have control."
What remain is the awareness-interestedness cycle (Fig. 2).

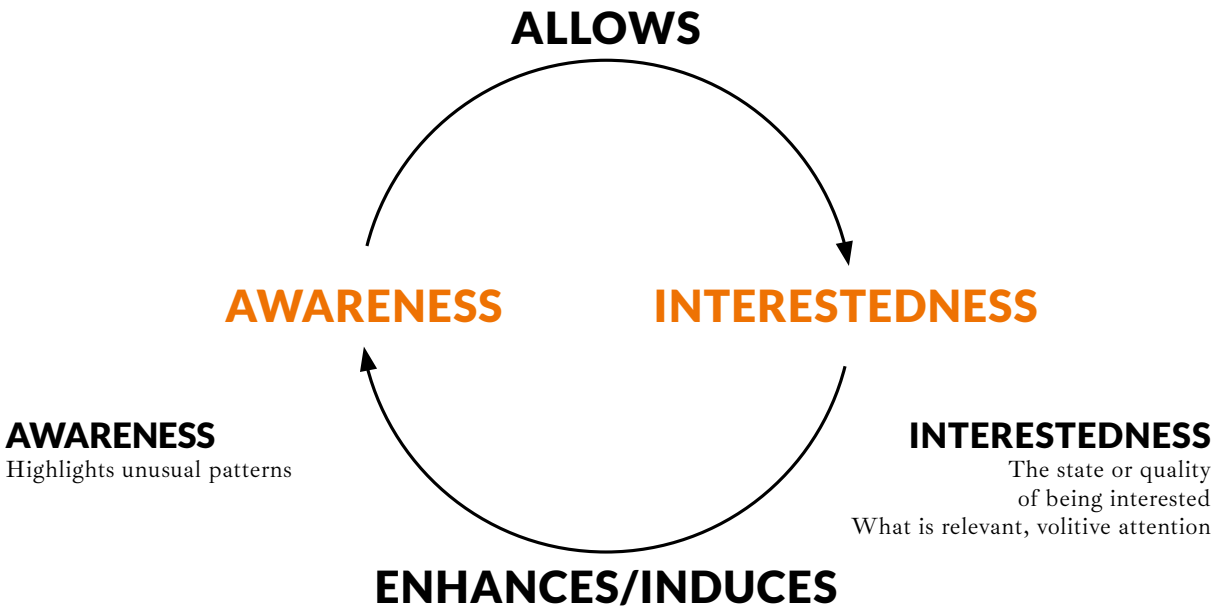

Figure 2: The awareness-interestedness cycle. To be interested in something implies being aware of something. Being interested in something enhances the ability to highlight what we are interested in already.

Interestedness is the state or quality of being interested. When we are interested in something we define what is more relevant and this changes our awareness and our susceptibility to the environment surrounding us. In other words, we cannot be interested in the item A if we do not possess information about A. At the same time, once we are interested in A, we automatically start following A selecting (being aware of) more information about A. The awareness-interestedness cycle is a feedback-loop cycle in which the output is caused by the selective nature of attention (Fig. 3).

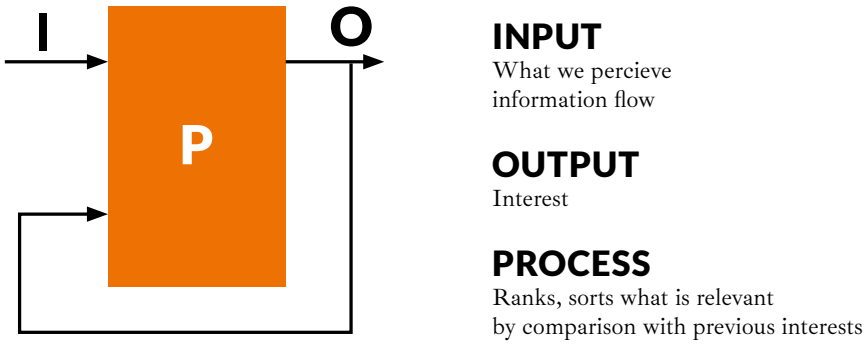

Figure 3: The Attention Feedback-loop.

The Inputs are what we perceive, the incoming information flow. The Outputs are our preferences, what we are interested in, and what we consider relevant. The Attention-process ranks and selects what is relevant by comparing new stimuli with those judged interesting previously.

The Process ranks inputs (or information) by comparison with what has been relevant in the past, allowing the feedback-loop necessary for the cybernetic being predicted by Norbert Wiener in 1950. In his own words: "(...) since perception was, in cybernetic terms, simply a condition of active feedback and feedback was what allowed cybernetics as a discipline to survive in the world of ideas" (Wiener, 1988, pp. 24–25). The biological attention-process is not immune to bias: for example, confirmation bias, attention bias and familiarity heuristic. Meanwhile, the artificial process of selection is purely statistical and past-driven, it is likely to cut novelties off.

Freedom and Emergent Properties

Enhancing humanity means stretching the human limits. We have physical and cognitive limitations. The Ancient Greeks recognized well what those limitations were and narrated the hybris: the ruin of the boldest through the tragedy. We are not limited only in a biological sense: we have technological constraints, too, as well we confine ourselves to legal, economic, social, and moral boundaries. We could say that: "Man was born free, and everywhere he is in chains" (Rousseau, 2007, p. 28). And freedom and autonomy are, indeed, the main arguments of this work. Freedom is deeply connected with volitional attention and consciousness.

- Being aware of what is happening around us and inside us is crucial for our autonomy.
- Focusing for a long time in the pursuit of mastering some domain through practice involves cultivating more profound freedom.
- Paying attention to someone proves our interest, respect, affection, commitment.
- The way we play with attention stimulates our memory and defines our personality, therefore our identity.

Enabling humanity, on the other hand, implies some degrees of uncertainty. Some new properties might emerge, they might be desirable. If we aim to enable humanity to something we cannot achieve or even conceive today, we might be forced to do something differently. Heidegger used the German word *Steuerung* referring to the Kubernetes, the word from which cybernetics is derived. The ability to steer or control something is constrained by feedback-loops, this means that within uncertainty you cannot know the consequences of your actions, but it is still possible to induce new information from errors. The romance and tragedy of the new human condition then lies, as always, in its self-contradicting nature in which hope is nourished by variance: a sort of Faustian relentlessness which makes the inconceivable a categorical imperative.

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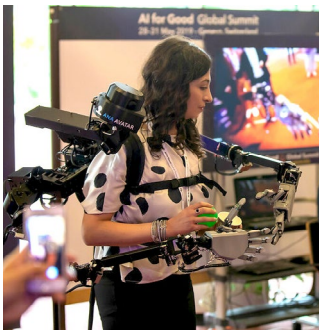

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