Cogito, ergo sum homo – crossing the thresholds between human beings, cyborgs and artificial intelligence

Roman Kolodii[1]

Sommario: 1. Introduction; 2. The Concept of Threshold: to Overcome Means to Transform; 3. Ontological, Epistemological and Dialectical Thresholds Affected by Cyber 4. Ontological Limitations to Cyber Technologies: A Case Study of Cyborg; 5. Epistemological Limitations to Cyber Technologies: A Case Study of Big Data; 6. Dialectical Limitations to Cyber Technologies: A Case Study of Cyberwarfare; 7. Conclusion: What Can We Learn From Philosophical Challenges to Cyber Transformations of Humans?

Abstract: Cyber technologies are believed to have reconfigured the way humans interpret themselves, as they changed routines, habits and mindsets that make up our lives. These tendencies lead to a growing conviction that humans can fulfil Nietzschean ideal and become overmen if they unfold the whole transformative potential of cyber technologies. This essay is a response to such claims. It addresses a growing assertion that cyber technologies necessitate philosophical re-interpretation of what humans are and what they ought to become. First, the study examines the capacity of cyber technologies to transform philosophical boundaries between well-established and separable categories like mind and matter, quantity and quality, and war and peace. To this end, case studies of brain-computer interfaces, big data and cyberwarfare were taken to practically test the assumption about philosophical limitations to cyber technologies. Then, the study relates these finding to the ideas behind transhumanism and examines whether cyber technologies can facilitate human transcendence into post-human entities boasting AI-enhanced intelligence and abilities. Finally, the essay concludes that there are substantial ontological, epistemological and dialectical obstacles to the transcendence of humans into technology, which is why philosophical interpretation of a human being should still be built on conventional, rather than cyber-related, premises.

Keywords: *Cyber Technologies, Artificial Intelligence, Big Data, Transcendence, Cyborg, Cyberwarfare.*

Man is something that shall be overcome. Man is a rope, tied between beast and overman — a rope over an abyss.
What is great in man is that he is a bridge and not an end.
Friedrich Wilhelm Nietzsche, Thus Spoke Zarathustra

We simply cannot transcend our human perspective, however much some may aspire to a God's eye view of the universe.
Ronald Giere, Scientific Perspectivism

Man lives always on the verge, always on the borderland of a something more.
Philip Wheelwright, Philosophy of the Threshold

1 A Masters student at the University of Glasgow, UK.

1. Introduction

The whole story of human genesis is a story of transformation, not the one of a finite predisposition or doom, and in that sense birth, life and death are all transitive junctures towards the unknown that wonders and troubles human mind. To penetrate the unchartered territories of experience, humans always transition from one state to another, encountering thresholds that separate the known from the unknown, as well as mark boundaries between one known and another known. These borderlines are essential for us to make up a picture of the world and better position ourselves, or take root, within it. In this light, the idea that humans can overcome all thresholds and reach a new stage of development as sentient species has become talk of the town in an increasingly digitized modernity. As we are more and more immersed inside cyberspace, a looming prospect of transhumanism has stormed in various media, technology and science discourses. Over the years, transhumanism has become a complex ideology whose exponents draw on philosophical, technical and cultural sources to prove that humankind needs to use technologies to substantially enhance its potential. Ultimately, according to transhumanists, human beings will integrate with technologies and transcend the natural evolution, gradually transforming into super-intelligent, powerful entities endowed with telekinetic, telepathic, extrasensory and other abilities. These ideas lead to a growing conviction that humans can fulfil Nietzschean ideal and become overmen if they unfold the whole transformative potential of cyber technologies. In this regard, the essay addresses an assertion that the growing potential of cyber technologies necessitates philosophical re-interpretation of what humans are and what they ought to become. First, the study examines the capacity of cyber technologies to transform philosophical boundaries between well-established and separable categories like mind and matter, quantity and quality, and war and peace. To do so, the author takes the respective case studies of brain-computer interfaces, big data and cyberwarfare to practically test the assumption about philosophical limitations to cyber technologies. Then, the study relates these finding to the ideas behind transhumanism and examines whether cyber technologies can facilitate human transcendence into post-human entities boasting AI-enhanced intelligence and abilities.

While aiming to cover this yet under-discussed and understudied aspect of 'cyber philosophy', this research builds on the ideas coming from ancient times up until the present day. There is a considerable corpus of literature exploring thresholds as transitive spaces [Wheelwright (1953), Gennep (1960), Genette (1997), Mukherji (2011)], or sites of difference (Deleuze (1994), DeLanda (2005), Bryant (2008), Weinbaum (2015)] that conceal new potentialities and opportunities for existential discoveries. The concept of threshold overall has been closely related to the philosophy of becoming [Whitehead (1960), Irwin (2005), Rose (2006)] that contrasts a constant change with idleness and stagnation of being. Due to Hegel (1929), Kant (1934), and Nietzsche (2006), the idea of transformation or transcendence has entered the philosophical thought and encouraged to ponder how humans could access the beyond-knowledge withheld from them by their biology. The early attempt to investigate how technology could help individuals achieve transcendence came with works of Ferre (1988), Meijers (2009) and possibly the first one of its kind – Heidegger (1977) who looked at technology as a means to dominate the nature and achieve unconcealment of the truth hidden within it.

However, it was only due to the recent revolutionary development in the field of ICTs and cyberspace in general that cyber technology has firmly implanted itself within a larger philosophical perspective on human transcendence. The studies devoted to biotechnology and brain-computer

interfaces [Tan and Nijholt (2010), van Erp et al (2012), Wolpaw and Wolpaw (2012), Olaronke et al (2018), Friendrich et al (2018)] have furthered the thinking on merging humans and technology and thus upgrading the human species to biomechatronic creatures with technology-enhanced organic parts – cyborgs. These studies contributed to an unraveling cyborg activism and the philosophy of transhumanism that advocates for physical integration of humans and machines [Fukuyama (2004), More and Vita-More (2013), Huxley (2015)]. The proponents of critical data studies and theories of cyber, including general cyberspace theory, have noted the impact of cyber on how humans conceptualize differences in quality and quantity when struggling to produce truth out of the collected data [Cukier and Mayer-Schoenberger (2013), Fricke (2015), Symons and Alvarado (2016), Ning et al (2017), Bencivenga (2017), Ning et al (2018), Gezgin (2018)], or between war and peace when cyberspace is still not regulated uniformly and suffers from malign activities such as cybercrime, cyberterrorism and data theft [Pili (unpublished), Berson and Denning (2011), Harrison Dinniss (2012), Reveron (2012), Gartzke (2013), Nye (2016), Ramirez and Garcia-Segura, (2017)].

Nonetheless, looking at the literature, what still needs more attention from a scholarly community is the question of whether cyber really blends everything which comprises our image of the world and opens up the doors to super-humanity. This essay seeks to nurture philosophical discussion of this question by defining and exploring ontological, epistemological and dialectical challenges to claims that cyber removes distinctions and borders and can reshape the fundamentals of human existence. These challenges stem from the internal paradoxes that characterize the influence of cyber technologies on humans, which are captured and closely scrutinized in this research. Overall, the analysis provided in this study enlarges the landscape of discussion on cyber technologies and their impact on philosophical idea of transcendence, and also offers a rather novel framework to analyze current developments in a technological world.

The structure of the essay grounds the conclusions. In the first paragraph we will introduce the concepts of threshold, becoming and transformation, and provide an intellectual framework for the subsequent analysis. This framework asks to look at becoming as a process of overcoming thresholds which signify potentialities of transformation and allow us to locate our existential purpose through teleology. In the second paragraph, we will apply this framework to the study of cyberspace and posit three questions that challenge the idea that the development of cyber can enable transcendence of humans into post-human entities from philosophical, rather than technical, point of view. In the subsequent three paragraphs we will try to tackle these questions by analyzing three case studies that demonstrate the philosophical implications of cyberspace – biotechnological breeding of cyborgs different from humans, the growing role of big data in the production of truth and cyberwarfare that takes place within a relatively peaceful international political landscape. Finally, the essay ends with a suggestion to revise excessive optimism about cyber technologies, as while blurring philosophical thresholds and boundaries, they still preserve or, at best, simply reshuffle them, which means that human transcendence into post-human technology-powered entities from a philosophical perspective is much more problematic than it seems from a technical perspective.

2. The Concept of Threshold: to Overcome Means to Transform

The first question that we need to answer is why we should speculate about thresholds in the very

first place, and why those are deemed important for the discussion of cyber. In examining cyber and thresholds, by the former we imply a complex of technical capabilities, devices, connections, and overall infrastructure that sustain cyberspace; thresholds here stand for epistemological boundaries that separate abstract and concrete categories and thus partition reality represented by these categories into more understandable and workable notions. My hypothesis here is that thresholds entail meaning and thus facilitate the fulfilment of existential potential of individuals. If it is true, the corollary would be that the presence of a threshold that separates two categories allows for possibilities of change and transformation of the phenomena that are essentially reflections of these categories in the real world. On the other hand, if thresholds are being erased, old trajectories of development should be abandoned and new ones introduced. To validate or reject this hypothesis, we first need to engage with two fundamental categories behind the idea of change as such – being and becoming.

What is the source of discussion on being and becoming? The question whether everything in nature and beyond remains static (as being) or dynamic (as becoming) has always wondered the human mind. In their pursuit for truth, purpose and meaning, humans have looked for the solidity of existential foundations to which they related their experiential exposures to material and spiritual dimensions of being. One of the first to champion the supremacy of the concept of being – Parmenides – in this regard believed that being is exactly 'a quest toward the truth' (Natanasabapathy and Maathuis-Smith, 2019, p.371). Contrary to his ideas, Heraclitus maintained that 'change is inevitable and that all matter undergoes change constantly' (Natanasabapathy and Maathuis-Smith, 2019, p.371), thus contrasting being with becoming seen as a fundamental state behind existence. The ontological anxiety ensuing from uncertainty about the foundational state of human existence risked bereaving humans of purpose, meaning, and wonder behind their effort of living. The way to soothe this anxiety has been to validate the phenomenon of our existence without reliance on purely biological premises, or, in other words, to intervene in the realm of mind and ask how it can exist and reflect on its existence at the same time. To reach this level of abstraction, which can be accomplished by stepping aside from one's mindfulness, an individual must unravel the essence of her being. If being essentially is omnipresent, self-sustainable and self-sufficient, it would mean that it is static and already depleted from within, and thus deprived of purpose. The absence of teleology behind being equals the absence of purpose in reflecting upon possibility of reflection undertaken by mind. Since this kind of reflection is exactly what can help us establish that we do exist, the omnipresence of being which results in the absence of change and hence the lack of purpose would mean that we should not have even been able to postulate any sort of purpose in our lives, above all the purpose to intend to validate existence, as intent itself is a derivative of a sense of purpose. Since we have an innate predisposition to set objectives, this clearly shows that being itself presupposes a purpose and therefore is dynamic and not stagnant.

This situation is possible because we derive purpose from change that we undergo or witness as onlookers in the outer world, enjoying in this case a status of 'the observer outside existence' (Weinbaum, 2015, p.285). Although not constant by its nature, change is a constant itself. It is reflected in human life immediately, as man is ever in the process of 'emerging out of one situation and into another' (Wheelwright, 1953, p.58). Purpose, in this context, is a possibility of change, and is inextricably linked to the process of becoming. My approach to being versus becoming is based on the idea that inevitably both are mutually complementary and do not reject the conception of one another. This is because the emergence of being could not be possible without

becoming, while the perpetuation of becoming could not be possible without being. Therefore, being is necessarily attached to becoming. If being was emergence that simultaneously would turn into perpetuation, would time take place within these moments? If not, how could being last and therefore exist? To validate existence, from this perspective, is to accept that 'the real is a continuous process of being born out of difference, i.e. becoming' (Weinbaum, 2015, p.289).

The question of existence, and hence of purpose and meaning, is thus linked to becoming that is reflected in time and space more than to being. And here is where thresholds come to the fore. Becoming presumes process, and hence lasting from point 1 to point 1+*n*. The distance between these points, however densely they might be placed from one another, is what we refer to as change. Then, as we have introduced what the change is, we can frame the core notion of threshold. The thresholds are the points where change may happen and thus they can mark transformation from one modus into another. They are manifold in the process of becoming, as they exhibit the capacity 'as a space and a starting idea to beget yet more crossing points, to proliferate into thresholds of other kinds – cognitive, representational and even critical' (Mukherji, 2011, p.18). 'The threshold poises at a moment of bubbling Brownian movement that at some unknown moment will transform from its overheated state and seize upon a point of difference, erupting into a new paradigm' (Irwin, 2005, p.1), or what we can call a new teleology. When it comes to becoming, teleology is revealed in the fact that 'the process of becoming involves elements of striving and effort (either cognitively or physically) to achieve a particular goal' (Natanasabapathy and Maathuis-Smith, 2019, p.371). Hence by understanding thresholds we can anticipate, or induce, transformation, and thus establish a particular teleology behind the process of becoming, or, in other words, to discover meaning through purpose.

Sometimes thresholds are clearly recognizable, like those between mind and matter, sometimes they are to be unfolded, like those between virtual and actual realities. Grasping them is essential to validate existence and postulate teleology behind being, as they can prove that becoming takes place, therefore meaning, represented in various opportunities of purpose, is possible. Both in natural and social life, if we detect the presence of a threshold it means that something exists and presents an opportunity by changing into something else. But if we see that a threshold disappears, it would mean that teleology behind particular process that preceded the overcoming of the threshold has to be revisited or even rejected. The dissolution of a threshold can be viewed in Deleuzian sense as the cancellation of difference that produces 'phenomenal change' (Weinbaum, 2015, p.307), which we will further explore in the case of a merger of mind and technology. These teleologies can be multiple since becoming itself presents 'a progressive determination' (Weinbaum, 2015, p.307) of 'subsequent paths and events' (Weinbaum, 2015, p.309) that form a trajectory of development after the threshold event occurred. (Weinbaum, 2015) Which one of these would be chosen depends upon the character of the change happening due to the displacement of thresholds that conserved a previous status quo. Therefore, we have validated the hypothesis presented in the beginning that thresholds, which are boundaries between philosophical categories and their representative real-world phenomena, exist in their own right and prove for us that we also exist accordingly, as we constantly *become*, rather than entrench ourselves in unchangeable *being*. Moreover, the nature of thresholds is that they allow for transformation, and therefore, with thresholds under our feet, we can look and aim beyond and convert our sensation of change into sensation of purpose and meaning.

In summary, this paragraph has introduced core notions and intellectual frames on which we will further rely in the study of cyber impacts on philosophical thresholds. The next paragraphs

will show whether cyber technologies dissolve thresholds and thus pretend to revisit our existential purposes and meanings that have supported so far our understanding of who we are and where we go existentially. From a technical perspective, the nature of cyber makes it a transitive domain in its own right, as digital infrastructure functions and expands through myriads of communicative and information channels that form a web of interconnectivity. In this regard, the idea of the threshold elaborated in this paragraph is a proper tool to help us examine whether interconnections on a technical level can lead to convergences on the level of philosophical categories. In the next part, we would look at cyber through the prism of thresholds to isolate the challenges and discrepancies that characterize its influence on philosophically discernable phenomena around (and within) us.

3. Ontological, Epistemological and Dialectical Thresholds Affected by Cyber

The second crucial question is why the idea of thresholds is vital for the understanding of cyber technology and its relation to humans. The arrival of cyber has apparently changed the world as we knew it. We have gradually entered what Floridi (2015) calls hyperhistory characterized by an incredible degree of interconnectedness. These developments also prove that cyber technologies have instantiated the process of becoming, as they have produced a previously unseen, profound change across various facets of human and social life. From this perspective, the understanding of cyber inevitably entails incorporation of the notion of threshold within any cognitive attempt to decipher what cyber is at the moment and how it can evolve in the future.

Cyber is in itself a transitive space which makes it close to threshold as such, as technology immanently is 'a transformative medium for society' (Boos, 2017, p.14). It allows for transmission of enormous amounts of information across continents, domains, time zones and entities. The main features of cyber that make the scale of its impact so monumental include ex-territoriality (cyber is detached from physical space whilst still operating inside material carriers), pervasiveness (its infrastructure covers extensive areas of human habitat), sophisticated technicality (it is reliant on massive machinery such as computational facilities, fiber optic cables, storage servers etc.), inclusiveness (it offers a relatively easy entry for individual and collective actors like companies, hackers, ordinary users etc.), multidimensionality (it is nurtured by different realms, including information technologies, power grid networks, market economy etc.), representativeness (cyber has developed numerous representations, in particular Internet).

All of these have allowed cyber to become a reality and a domain that builds upon conventional dimensions of existence of individuals and societies. Cyber has connected physical objects, radio frequencies and minds and thus has exerted an unprecedented influence on human conscience in its broader sense – now natural objects, technical facilities, information flows and endless amounts of institutions and other structures, like economies of services and products, have become integrated inside human self-perception and hence their ontological self-awareness. Now persons do not end where their body ends, but extend farther beyond into the depth of cyber reality that surpasses human life and physicality at large. As it was pointed out in one insightful study, 'cyberspace is no longer confined to merely digital world but extends beyond it to involve various aspects of physical, social, and even thinking space' where 'reflection, imaging, dreaming, creating, etc.' take place (Ning et al, 2018, p.1843). Humans no longer are only humans, they carry along a heavy cyber infrastructure implanted within them.

Considering a growing power of cyber technologies and dwarfing prospects of their receding

into a controllable pace of development, cyber has presented the mankind with urgent ontological (who are humans now and what are they to become?), epistemological (how do we define quality of knowledge and thus establish the truth?) and dialectical (how do opposites interact with each other and propel existential dynamics?) questions. These are important philosophical challenges that cyber has posed to human intellect. In fact, not only has it blurred the thresholds between various previously autonomous areas of being, but it also, based on the pattern described in the paragraph above, by dissolving these thresholds has generated a vocal demand for rejecting previous teleologies. To illustrate, cyber is arguably capable of merging mind and matter, namely human mind and technologies, which is why humans no longer should rely on natural evolution to become more intelligent but should replace this trajectory with a purpose of becoming cyborgs, or in other words – super-humans. This poses an ontological challenge – what then will humans be? Another example is the fact that cyber, in particular through big data and machine learning, erases the threshold between quantity and quality, as more and more data arguably help us *better* understand the qualitative characteristics of social phenomena and processes. Therefore, separate qualitative evaluation should be substituted with another purpose – creating artificial intelligence that would automatically convert data into knowledge or quantity into quality without the reliance on human intervention. This is an epistemological challenge. Finally, the dialectic idea that processes are driven by dynamics of unity and conflict of opposites has also been affected by cyber. Cyberwarfare, for instance, blurred the line between war and peace, as conflicts now tend to erupt inside and despite a relatively peaceful international situation. Consequently, the teleology that should now be postulated is not to view cyber as a peaceful setting, but rather as a battlefield where countries should fight to assert their preferred rules of the game (Pili, unpublished). This is a dialectical challenge posed by cyber.

Although these instances of the impact cyber exerts on the mankind largely fit the pattern outlined in the previous paragraph, we would argue that it has not dissolved thresholds between biology and technology, quantity and quality, and war and peace. It did blur the distinction between all of these, but paradoxically has not undermined fundamental differences between philosophical categories and their real-world representation. This makes calls for rejecting current teleologies from transhumanists or tech-optimists much more problematic than it might have seemed.

To sum up, the key features of cyber domain that empower it across various avenues of human endeavor are possible due to the most fundamental mechanism behind cyber technology at large – interconnectivity. Cyber has been born through the connection of radio frequencies, computational devices and physical infrastructure, and thus it is in itself a transitive, borderline space. The fact that humankind connects to cyberspace should, therefore, be regarded as philosophical continuation of an innate process of connectivization of cyber, and hence it must be studied through the means of philosophical analysis. This essay, therefore, seeks to answer ontological, epistemological and dialectical questions about cyber technologies and contributes with the analysis of internal paradoxes that attend further integration of cyber into our mind and muscle. In the next three paragraphs we will explore three case studies of the impact cyber might inflict on the philosophical foundations of existence and carefully elucidate why it will still be significantly limited.

4. Ontological Limitations to Cyber Technologies: A Case Study of Cyborg

The proven immense potential of cyber technologies that has stunned and mesmerized humans led them to realize the immanent weakness and limitation of their innate, biologically determined capabilities. What used to seem a horizon that we were constantly approaching but never coming close enough has now turned out to be a threshold that we stepped upon firmly. Behind us is an unyielding confidence in our intellect reflected in a perseverant cognitive endeavor, before us has reigned in the uncertainty fueled by fears about a much faster growth of technologies. This has eventually raised a question of how the inherent incapacity of humans can be surmounted to accomplish further missions of our existence. One of the solutions to this problem – merging humans and technology – has gradually dominated the technology discourse in recent years, but its philosophical implications are opaque and should still be fully unfolded.

First of all, let us look at the reasons why it became customary to think that cyber can remove boundaries between humans and technology. For a long time, transhumanism advocated for combining humans with technology to wrest biological destiny of humans from 'evolution's blind process of random variation and adaptation and move to the next stage as a species' (Fukuyama, 2004, p.42). But the tremendous advancements in cyber technologies have generated a persistent uneasiness about the possibility that a leading driving force behind technological development - artificial intelligence – will outperform and surpass humans, which modified slightly the inspiration behind transhumanism. Against this backdrop, many organizations operating in cyberspace have joined efforts to use cyber to integrate humans and technology with a clear-cut purpose – upgrade humans to more intelligent and more capable cyborgs and thus retain human primacy over AI. Therefore, the embedding of technologies inside human body is believed to increase the sense of control over technology. The possibility of technology to surpass humans in virtually every area of endeavor generates fear that it might claim political supremacy over individuals (Raulerson, 2014). In this case, the algorithmically-produced conclusion that humans are inferior in their intellectual capacities to artificial intelligence might lead to its sovereign decision to annihilate less productive societies. Merging technology with humans, in this regard, can help attach the pace of technological development to the one of human natural evolution and keep it checked and balanced. In this scenario, technological development becomes a set of technical responses to human requests and demands, so the path of technological advancement is controlled and determined, and brindled by syntax and structure of cognitive quests undertaken by humans. Also, having technology within human body may arguably help overcome a sense of alienation or otherness of technology and thus mitigate psychological predisposition to treat it as a source of potential hazard, which slows down the process of harnessing technology.

Inspired by these aims, an impressive number of studies, research initiatives and companies have mushroomed and received massive investments to undertake first attempts to bring mind and matter together in an immediate, physical way. A recent presentation of the company Neuralink on advances in developing brain threads, coupled with earlier successful attempts of integrating machines and human such as cases of Matt Nagle or Neil Harbisson all credibly show that physical merger of humans and cyber is looming larger on a horizon. Nagle who had a brain-computer interface implanted in his skull to help him defeat paralysis could control a cursor on the computer screen with his thought, while Harbisson has an implant that allows him to convert colors to audible vibrations and thus recognize them despite inborn color blindness. Both men have been

called first cyborgs, to a varied degree of exaltation. But even if a complete symbiosis of body and device is feasible and close to implementation, will it mean that humans will transcend their bodies and transform into a brand new entity due to cyber?

Cyber has indeed narrowed the space between a man and technology, but it failed to dismantle a fundamental difference between both. Technology has always been viewed as an extension of human potential, serving primarily as a tool to transform nature and augment comfort of living. As was stated by Ernst Kapp, technology, or Technik, was in certain way an '"organ projection," that is, an extension of the human body' (Mitcham and Schatzberg, 2009, p.39). Being both a fruit of human mind and a tool for implementing ideas into material, technology was indispensable in creation of culture and structures buttressing modern society. However, the fact that technologies were materialized in tools, vehicles or devices created an impression that they are an extension of human abilities beyond its biological boundaries. They existed outside humans and therefore the idea of extension beyond was crucial in forming a philosophical attitude towards technology as such. In Heidegger's philosophy technology, for instance, is instrumental in 'the transformation of nature itself' (Caputo, 2010, p.6), and discovery of environment (Caputo, 2010, p.18), which means that it is inherently pointed beyond or outside, as it is the nature 'toward which man's ordering behavior can be directed' (Caputo, 2010, p.7) through technology to harness its potential. In contrast, the arrival and expansion of cyber has challenged this seemingly well-established idea. Cyber-based technologies, like virtual reality or social networks, are now penetrating the mind of humans and shaping its perceptive and contemplative abilities. Unlike conventional technologies, cyber-based technologies become increasingly internalized, which means that technology is no longer an extension beyond but an extension within. From this perspective, it appears erroneous to treat it as a tool since it is becoming part of body and mind, and therefore of an entire being of an individual. Here it is essential to establish what we consider to be 'pure' human and 'pure' cyber in order to understand where the threshold that we deem affected is situated. In terms of mind-matter dichotomy that we rely on in this analysis, pure human would mean organic in matter aspect and thinking in mind aspect. Pure cyber, on the other hand, would be mechanical in terms of matter and intelligent in terms of mind (an independently thinking AI in the singularity discourse). Due to the sheer nature of pure phenomena, both pure human and pure cyber exist only as ideals rather than readily accessible objects. Humans have already integrated with some non-organic objects that do not belong to their flesh, like clothes, or glasses, or cell phones etc. Similarly, cyber cannot function without human operators and be purely, 'independently', mechanical. Therefore, in real life we deal with not entirely organic humans and not entirely mechanical cyber technologies. But if in terms of matter both human and cyber aspects are discernable, it is much harder to distinguish thinking humans and intelligent cyber in terms of mind. Even more so, what should be established is whether or not the integration of corporeal humans and technological objects in terms of matter could bestow human intellect on machines in terms of mind. Can there be such a spillover effect? I would argue that this is highly problematic from a philosophical standpoint, and what we might call an integrating effect produced by cyberspace does not amount to an extensive removal of threshold between technology and human beings, as we shall see below.

The first problem is a diminishing role of human component within a symbiotic co-habitat of flesh and metal. The optimal proportion of human versus technology within a corpus of a cyborg is not clear. For the time being, technologies are vastly stronger than humans physically but still lag behind in a number of cognitive performances. Nevertheless, the rise of computational

power coupled with more and more sophisticated machine learning techniques is narrowing the difference in cognitive abilities of humans and machines. This rivalry has important implications for human transformation into cyborgs, in that, if integrated, an increasingly stronger technological component might dwarf the human component within a cyborg. The idea that the implantation of technologies inside the brain or other parts of human body will make humans stronger is as wrong as it is true. It is true that technologies will enhance abilities of humans, but human component itself will remain still. Similarly to glasses that enhance vision but cause gradual deterioration of eye muscles due to their idleness, technologies inside our bodies might enhance our performance as cyborgs but lead to the stagnation of our human component inside the symbiotic organism. Technologies thus strengthen cyborg but weaken humans inside the cyborg, as they are a stronger component that multiplies our potential in manifold ways. For instance, cyber-powered brain-computer interfaces that arguably eliminate the threshold between mind and technology contain an intrinsic limitation, namely that in this case 'the signals received from the brain are prone to interference' (Olaronke, 2018, p.1), such as eavesdropping, data interception or theft, as well as disruptive cyberattacks. Furthermore, as recent studies show, they BCIs can curtail human autonomy during their interactions and negatively affect decision making. 'Based on previous information about the user, the machine could influence the development of the user's reasons by altering the user's options to act self-reliantly. An attenuation or absence of options to choose from - without the explicit endorsement of the user - has the potential to impact self-determination, since controlling influences are present' (Friedrich, 2018, p.11). Therefore, technological vulnerability to cyber intrusions and external influence, as well as the impact of cyber technologies embedded inside human brain on self-determination of individuals and therefore their free will questions the possibility of cyborgs to achieve transcendence as the liberation from human ills. In fact, from this point of view, transcendence of humans will be not their reinforcement but their diminishment, which slightly contradicts the pathos expressed by the proponents of transhumanism about a cyber-man conquering new heights of his existential potential.

But what if technologies and cyber drastically improve our critical and logical thinking? Will this lead to important philosophical discoveries of human race? Although it is highly disputed whether artificial implants would step up our capacity to work with abstract notions, we can at least suppose that preconditions for such a conclusion exist and it might be the case. And yet, the ability of humans as cyborg to decipher transcendental categories like God, divinity, eternity, good, evil etc. would be problematic. To decipher these notions means to unfold their genuine meaning as humans unfold a genuine meaning of the nature through physics, biology, chemistry etc. However, the idea of transcendental is closely bound to the idea of spirituality, as the border which separates the known from the unknown of the human being lies along the fault line between body and spirit, or matter and energy. By transforming themselves into cyborgs through physical integration with technologies, humans create new boundaries to their pursuit of transcendental. Tremendously magnified sense impressions of cyborgs enabled by the use of technology will equally magnify the experiences that stand on our way to discovering spirituality. The merger of cyber with humans thus leads to increased materialization, rather than spiritualization, of human mind, and this diminishes the prospects of transhumanism bringing new philosophical 'revelations' for human race. As Kant finely captured it, this is because transcendental categories that nurture our spirituality are given *a priori*, i.e. before any experience of ours. These categories cannot be comprehended empirically, which makes them immune to any intervention from cyber-enhanced

reasoning. In other words, cyber-powered cognitive and sensory abilities of cyborgs might surpass those of humans in their understanding of the empirical experiences, but could fail to help cyborgs achieve 'revelations' about non-, extra- or pre-empirical notions of divinity, beauty, immortality, soul and others that could otherwise revolutionize our understanding of what the spirit is and how we should strive for it. Therefore, cyborg will be equally unable to achieve transcendence to spiritual awakening as humans are now, and in this respect our progress towards this goal is still heavily restricted.

In summary, the merger of technology with human body and mind could reinforce some physical, sensory and cognitive *performances* of humans, but will weaken physical, sensory and cognitive *abilities* that are purely human and will overall characterize the human component of a cyborg in contrast to a more powerful cyber component thereof. Secondly, in terms of spiritual discoveries, cyborgs would still be unable to transcend the categories that exist irrespectively of experience and empirical facts, like divinity, beauty, immortality etc., as 'material' technologies cannot intrinsically access areas of spirit that precede the matter. In the next paragraph we will investigate how cyber domain shapes the way we produce knowledge based on quantitative and qualitative judgements. This would show whether or not cyber technologies have dismantled the threshold between quantity and quality – other two philosophical categories that have a direct bearing on the way we conceive of truth and, therefore, meaning. If the threshold still persists, as it was the case with mind and matter, it would mean that the ability of cyber domain to help humans transcend epistemological foundations of their existence are limited and cannot make out of humans completely new epistemological entities.

5. Epistemological Limitations to Cyber Technologies: A Case Study of Big Data

In this paragraph we will look into big data and machine learning technology as prominent drivers behind reconceptualization of quality from an independent measurement into a derivative of quantifiable data flows. If it holds true, then cyber has uninstalled a threshold between quantity and quality with the latter necessitating more enhanced computational and evaluative interventions enabled by artificial intelligence and diminishing the value of human interpretation of quality as such. What are the sources of our doubts that we ever conceive of quality correctly? A radical increase in computational capacity of various machines throughout last couple of decades has allowed humans to identify, collect and process enormous amounts of data about both natural and social phenomena. More importantly, most machines are designed to conduct quantification of objects of reality and measure them against various metrics to establish links and correlations. The incursion of computers into growing consumer markets and their convergence with daily lives of their users has reconfigured our understanding of quality into a belief that it has a data structure sustained by frequency of representation of particular qualitative patterns in a more and more solidified human-machine nexus.

By connecting humans to large processing facilities, cyber has allowed for an unprecedented access to individual and collective attributes such as habits, behaviors, ideas, mindset, temper, status, political, sexual or food preferences, but also fears, grievances, expectations and dreams. All of these attributes that reflected psychological activities of personalities became increasingly quantified in spite of their qualitative nature. This is because the ability to extract data from almost every online activity of individuals resulted in massive flows of information that are closely related

to each other as they have many intersections. By converting these data into numbers humans taught machines not only to process them but also to establish patterns and measure degree of some cognitive representations of individuals. Coupling one set of data with another allowed machines to detect correlations, dependencies and links between various terrains of human mind and body, or, in other words, to make a model of human soul and calculate probability of its moves with an increasingly high degree of precision. Philosophically speaking, cyber has indeed blurred the threshold between quantity and quality. Large amounts of data increase to an extent that allows them to cover more and more qualitative aspects of human being, and the volume of information collected so reaches a point when those torrents of digits and figures translate easily into an emerging biography of an individual due to the fact that they are so pervasive, ubiquitous and coming from every corner of human psyche and agency. It means that cyber instantiates the Hegelian dialectic observation of quantity's transition into quality, but also the opposite is equally valid – by converting qualities to measurable units known as big data cyber has achieved decomposition of quality into quantities. This situation lures us into thinking that 'we are now at a stage where quantity becomes quality, and the sheer amount of available data gives access to unvarnished truth' (Bencivenga, 2017, p.135).

But apart from the fact that larger amounts of data can give an idea about the quality of what this data makes up, a more relevant Hegelian demand would be to establish whether there is a *change* of quality if the quantity augments or diminishes (Hegel, 1929). The existence of change proves the existence of a threshold, and its occurrence confirms the transformation, or the overcoming of the threshold. In this regard, the increase in the scale of collected information arguably makes machines smarter, better and more powerful entities. But is it really so? First, we need to ask what the causal precedence is in this case: is it due to the fact that machines become more capable that they can gather larger volumes of data, or is it that exactly more data makes machine incrementally potent? Certainly, cyber has produced a double-edged effect when the increase in machine processing capabilities allowed for a larger exposure to various sources of data, and then data itself made machines able to deliver more comprehensive outcomes, as, based on algorithms that sort different data sets, they become able to identify, analyze and predict behaviors, although to a varied degree, of non-mechanical entities, namely humans. But we still tend to believe that the first pattern is valid predominantly. Technically speaking, first comes the capability, second comes the capacity. It was only due to a qualitative enhancement of computational equipment that more quantitative information ended up more readily accessible than ever before. It means that the change of quality propelled a change in quantity in the very first place. But does the opposite hold true, namely that quantitative changes may induce qualitative transformation? By quality transformation I mean the transformation of an entity into a different substance, like transformation of water into gas or ice (Carneiro, 2000, p.12926). In case of machines that are based on artificial intelligence the quality change would mean the 'naturalization' of their intelligence, approaching, if not reaching, the one of humans. When it comes down to cyber and machines, this seems to be not true. The fact that machines can detect more correlations between data sets and establish behavioral patterns of humans and anticipate their life choices hardly make them smarter in a quality sense. As it was well articulated in one of the studies, 'Big Data—insofar as they are data, or theoryless—will never provide knowledge, no matter how powerful our computers might be... A machine does not have a mind, so the whole range of mental life is denied to it. A human operator using a machine can (since she has a mind) guide the machine by her thinking, her speaking meaningfully, and her

theorizing; but, whatever the outcome of that process is, the machine remains a brute, and a tool' (Bencivenga, 2017, p.140-141). It is the method and interpretation designed by humans that help derive any meaning or utility from big data, as 'massive amounts of raw data are meaningless unless a question is posed, an experiment standardized and a sample curated' (Symons and Alvarado, 2016, p.5), which necessitates human guidance rather than AI-driven autonomy. Therefore the precision, exactness, accuracy and fullness of data that computers collect do not make machines more precise, exact, or accurate, as these features of data are a matter of judgement of humans, therefore they acquire such quality in an extra-cyber, or beyond-cyber setting. Big data, therefore, 'without interpretation [...] has no intrinsic value. The same big data can be interpreted in various ways to come up with various theories and models, which means that big data cannot impose a particular truth; in other words, it cannot lead to miraculous discoveries, as it involves some degree of mental processing much like inventions' (Gezgin, 2018, p.7). In this regard, machines receive raw data and produce raw data with discursively inspired associations, without changing the quality of each data unit it generates as result of computational modeling and simulations. Hence cyber cannot conduce to the qualitative transformation based on the changes of quantity. As it was stated powerfully in a Chinese room argument, the way machines work with input data and produce output data has no bearing on how intelligent they are. Proposed by Searle (2009), Chinese room argument claims that if a non-Chinese speaker sits in a room and receives Chinese characters from one door and then, after manipulating them according to some program, hands them over through another door as meaningful sentences, this would reflect precisely the way machines work. In fact, they conduct operations with data in accordance with predefined rules, but do not understand what they do and thus do not think. Although there is a heated debate on Searle's argument, I would side with it, as it accurately demonstrates that overwhelming data flows do not automatically and autonomously produce qualitative change of cyber-based objects, as machines do not possess critical reasoning to deliver judgement on the quality of those datasets.

To sum up, the paragraph has shown that cyber domain blurs the boundary between quantity and quality, as data collected and disseminated by computers tend to cover an increasing number of non-numeric and non-quantifiable aspects of human beings, including their habits, mindsets, fears, dreams etc. However, the increase in data gathered by machines does not propel the change of quality of neither machines nor their output. This is primarily because machines cannot think and thus evaluate 'the quality of quantity' without reliance on human assessment. It means that the change of quality happens within the boundaries of human judgement, hence in a non-cyber area. Therefore, epistemologically, cyber technologies do not revolutionize the way we perceive truth, which in its own right results from the transition of quantitative changes into qualitative ones, but are heavily dependent on the intervention of human reasoning. In the following paragraph, I will continue to draw on Hegelian laws of dialectics to establish whether or not cyber domain shapes the unity and struggle of opposites that make any transformation in real world feasible, possible, and accomplished. For this purpose, I will investigate the impact of cyber on war and peace to corroborate or invalidate an assumption that it has erased the threshold between both and thus urges to alter our conventional conception of what is peace, and what is war.

6. Dialectical Limitations to Cyber Technologies: A Case Study of Cyberwarfare

The nature of cyber has indeed tangibly affected distinctions between war and peace as evidenced

by increasing instances of cyberwarfare within rather peaceful arrangements between states. More specifically, cyber-intelligence undertaken by both governments and individuals seem to combine elements of warfare and peacetime intelligence which calls to reconsider fault lines between war and peace in the modern world. Some organizations like NATO discern computer network exploitation, known more commonly as cyberespionage, from computer network attacks that cause tangible harm for the cyber networks of the affected entities (Sarbu, 2017, p.131). However, this distinction lags behind the impressive pace of malware improvement which camouflages the nature of an intrusion extremely effectively. This is also demonstrated by the fact that the activities aimed at collecting data quite often may result in a real damage or vulnerabilities of cyber facilities amounting to an instance of cyberattack and therefore – cyberwar as shown below.

Firstly, cyber activities seemingly limited to gathering data are executed in a way that follows the same pattern as cyberattacks designed to harm or suspend the work of communication networks, especially during the phase of malware deployment. To illustrate, the theft of industrial data of American company Telvent allowed perpetrators to access cyber structures of the company, which, if affected directly by a virus, could have been capable of halting the work of the energy system of the U.S. (Segal, 2013, p.42). Therefore, the identification of the nature of the intrusion and assessment of its proven or anticipated scope and effects has become so delicate and subtle that any cyber intrusion is presumed to be cyberattack in the very first place. The failure to do so could easily prove fatal for the security of the state if the intrusion is indeed a warfare effort, so the cost of misinterpretation in cyber thus grows enormous.

Secondly, spying malware often has dual-payload that allows it both to exfiltrate data and to disrupt the work of boot sequences of machines thus causing material damage. In other words, spying malware is always a double-edged sword that can be used to threaten as well as destruct. 'Whether the deployment of such a payload amounts to espionage or rises to the level of the threat or use of force is a difficult question to resolve' (Pelikan, 2012, p.366).

Thirdly, cyber intelligence has become an indispensable part of preparing battlefield for more severe cyber interventions. It can be used to test and probe communication networks to find loopholes and weaknesses that can be used for offensive cyberattacks designed to disrupt and destruct. For instances, quite often cyber-spying malware leaves behind 'software programs that could be used in the future to disrupt [...] critical infrastructure' (Hjortdal, 2011, p.6). Moreover, frequent cyber interventions for spying purposes simply weaken the security of internal cyber facilities and leave them bare in the face of potential disruptive attacks.

Finally, economic cyberespionage when hackers steal commercial data to help their countries gain competitive edge in economic development inflicts immediate visible damage that can monetarily be compared to expenditures on military operations. Since markets are dependent on trust, the adverse effects security breaches cause for customers' loyalty result in a deteriorated economic landscape in many countries. This fact undermines argument that cyberespionage does not amount to the use of force because 'there is no physical damage or loss of life' (Banks, 2017, p.523). In fact, the theft of trade secrets leads to frustrated financial situation on the market and enormous losses for companies and governments, recently calculated to reach the point of $300-600 billion annually (Banks, 2017, p.521).

As we can see, the nature of cyber, in particular its growing presence, borderless outreach and ex-territorial manifestation, has made the threshold that marks transition from peaceful actions to warfare less and less visible. By blurring the lines between peace and war, cyber has caused much

concern on the part of policymakers, as the way and mold in which governments should act or respond to others' actions is unclear, even puzzling. However, thinking that cyber space has erased boundaries between war and peace might be not enough to understand a true impact of cyber on this distinction. In order to capture the substance of what war and peace is within cyber, it would be warranted to first look back in history on the origins of war and peace. In fact, countries were involved in war activities from the onset of social evolution, but it was the arrival of international law that first defined what war was and what were the legitimate means and ways of warfare. Before overarching regulations governing law of war came into being, the war had been waged for the purpose of regulating post-war setting. In fact, wars have always been waged to reach peace, but on one's own terms (Junger, 2011). Establishing rules of the game, subsequent conventionalities of post-war arrangements was something military and political minds have been struggling to achieve from the very beginning. In this regard, war has always presented a deviation from rules of the game that preceded its eruption. Its departure point, in this respect, was a disadvantaging status quo and its destination – new rules that would assuage the ambitions of governments involved (Pili, unpublished). So even without an overarching regulation wars have appeared to be an act against cemented informal regulations governing inter-, or intra-state relations.

Cyber has changed this situation dramatically. There has arguably never been peace within cyber. From the very beginning it seemed to be, contrary to people's expectations, 'a law-immune area, open to unregulated, unrestricted hostile activities' (Ramirez and Garcia-Segura, 2017, p.244) which has been proved by a long list of cyberattacks taking place since the advent of the Internet (Berson and Denning, 2011). Its departure point was an absence of both formal and informal regulations, and its destination, as was convincingly proved by Pili, - the establishment of rules according to one's visions, strategic culture and values. Since there were no internationally agreed frameworks to standardize cyberwarfare and impose legal restrictions on its exercise, an increasing number of scholars tend to believe that existing frameworks, like international humanitarian law can be applicable to cyber operations. However, this application could have been possible if cyber operations were regarded within a context of armed conflict, which is so far a missing component, as countries are nominally in peace (Ramirez and Garcia-Segura, 2017, p.245).

Consequently, cyber has indeed blurred the boundary between war and peace, but it also, paradoxically, encircled itself with a boundary. This tangible fence around cyber separates it from other domains and defines it as inherently a war zone, due to the fact that cyber has never been peaceful and instead become increasingly identified as a battlefield rather than a marketplace where mutually beneficial exchange between states takes place. Of course, many peaceful exchanges are happening between nations inside the cyberspace. Modern communication technologies have allowed for an unprecedented level of connectedness between governments, companies and individuals. But equally during pre-Westphalian times when wars were pervasive and borders were fluid and changing constantly, people were still engaged in many sorts of commercial, cultural, and trade activities and interactions despite the ongoing hostilities. Cyber, therefore, is primarily a pre-Westphalian domain with 'limited barriers to entry in cyberwarfare' (Gartzke, 2013, p.45) which is why it is predominantly war-dominated while preserving spaces for peaceful exchanges. From this perspective, by obscuring the threshold between war and peace, cyber has defined itself as a war zone thus creating a boundary around itself and delineating its internal environment from other fields of human endeavor where war and peace are more easily identifiable. While there is uncertainty about what is war and peace within cyber space, there is certainty that cyberspace itself

is a war zone. This is a staggering paradox. The U.S. Defense Department's guidelines on treating cyberspace 'as an operational domain to organize, train and equip' (Reveron, 2012, p.4) to take the full advantage of cyberspace's potential for military purposes only proves the point that cyber is now increasingly viewed as a source of tension and threats to both states and societies, while the idea of cyber peace has yet to arrive.

In conclusion, while looking at the case study of cyberwarfare, we saw that cyber technologies have closed a gap between war and peace, making them dialectically 'the unity of opposites'. However, at the same time, they have redefined the entire cyberspace as a battlefield where cyberattacks and provocations are taking place constantly in contrast to other fields of human endeavor characterized by peace, thus instigating a continuous dialectical 'struggle of opposites' – a contention between war-ridden cyberspace and peace-driven non-cyber areas, like culture, economy, finance etc. Therefore, cyber domain has not changed this fundamental law of dialectics on which our existential perceptions and notions are firmly grounded.

7. Conclusion: What Can We Learn From Philosophical Challenges to Cyber Transformations of Humans?

Based on the analysis provided above, we can see that it is quite problematic to reject conventional teleologies behind various processes affected by cyber technologies. The application of the concept of threshold helped us clarify and isolate the most salient patterns of transformation that cutting-edge technologies have inspired and enabled in the pursuit of a fundamental overhaul of human and social philosophy behind meaning and truth. From this perspective, cyber has indeed narrowed a gap between mind and matter, quantity and quality as well as war and peace, but its internal structure contains limitations suggesting that it has not disrupted fundamental principles of transcendence and dialectics. The ongoing evolution of cyber technologies and its increasing implantation within our lives does not necessarily entail that cyber is a tool that can automatically propel humans to the stage of post-humans through transcendence or transform societies into superintelligence-driven communities.

The development of cyber does have philosophical implications, and its impact on human evolution is undoubtedly overwhelming. However, so far cyber technologies do not exhibit potential to help humans achieve a leap in their ontological self-perception. It is still humans who have to grapple with long-lasting doubts about the purpose and meaning in life and achieve enlightenment using their mind rather than technologically enhanced capabilities. Although cyber has blurred the lines between various areas of important individualistic and societal processes, it still solidifies some internal thresholds within them, like a threshold between biotechnological and spiritual in case of cyborgs, a difference between quantity and quality in case of machine learning-based big data, or a threshold between cyberwarfare and other predominantly peaceful domains of social endeavor. More specifically, by transforming themselves into cyborgs through physical integration with technologies, humans create new boundaries to their pursuit of transcendental, as they enhance physical experiences that do not have access to categories of spirit. As regards big data, its increase does not lead to a qualitative change of data or data-producing machines, as they still fail to exhibit thinking process analogous to the one of humans, whilst qualitative evaluation of incoming data is still conducted beyond cyberspace by human judgement. When it comes to cyberwarfare, its omnipresence has made the entire cyber domain a weaponized field and even a

battlefield, which stands in a staggering contrast to other realms of human engagements like culture, economy, science etc. thus creating a boundary, or a barbed wire, around cyberspace *in toto*.

Overall, these paradoxes might be mitigated in the future with new advancements of technology, but their presence within cyberspace suggests that a view of their impact on philosophical premises of human self-awareness should be built on pragmatic grounds, rather than replicate overtly optimistic scenarios of human liberation from the fetters of existential anxiety and confusion through the means of cyber-powered devices. There are no doors without thresholds, and there are no discoveries that are not hidden behind doors. If humans want to enter the unchartered areas of the unknown, they have to step over thresholds however blurred and unclear they might be. Only thus can they be sure that they are entering some brand new spaces and realms. Only thus can man overcome himself.