TECHNOLOGIES OF THE SELF:

HOW ARE DIGITAL TOOLS AFFECTING HUMAN ONTOLOGIES?

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Abstract

In a 1988 essay, Michel Foucault offered a historical overview of various "operations" used since classical antiquity and through Christendom by individuals hoping to transform their bodies and minds to enhance their existence. He dubbed these practices "technologies of the self". Three decades later, as Information and Communication Technologies (ICTs) have grown in complexity and power, and our relations with them become more intimate, it is inevitable to ask whether and how they are affecting human self-understanding. This paper compares two approaches that address the former question by re-interpreting and expanding Foucault's concept; one is framed by postphenomenology and media theory, the other stems from an informational (constructionist) view. The two interpretations have points in common, but their analyses arrive at fundamentally distinct conclusions. While the former argues digital simulations are merely expanding and fragmenting but not radically altering human ontologies, the latter shows ICTs are deeply transforming how humans present themselves to themselves.

Keywords
AI
ICTs
Ontology
Philosophy of Information
Postphenomenology
Virtual worlds

1. INTRODUCTION

Over the last decades, our relationship with Information and Communication Technologies[1] (henceforth ICTs) has becomeanothing short of intimate. Smartphones — our inseparable companions — along with a swelling list of apps, wearables, and "smart" appliances, enable the generation, collection, storage, and sharing of unprecedented volumes of data about every aspect of our daily lives. Kilometres run, steps taken, frequency and intensity of workouts, heart rate, hours of sleep, calories consumed, time meditating, mood variations, water intake, tasks done, places visited, and people befriended are but some of the things that can be tracked. Whether for social, economic, or health-related reasons — or for sheer curiosity and personal enjoyment, a growing number of people are now employing gadgets, productivity methods, and "lifehacks" to track their activities — the Quantified Self movement being the quintessential manifestation of such cultural trend.[2] While using dedicated mechanisms to intentionally track one's own activities and thus acquire detailed *information* about oneself might seem a (controversial) contemporary fad, the fact is people have been doing it for millennia. The specific reasons are too varied to be accounted for, but they generally imply a desire to enhance one's existence. The problem, however, is that contemporary self-modification is not only being carried out intentionally by people wielding tracking devices; but that it is also inadvertently occurring through our daily interaction with systems that are not generally conceived as technologies of self-transformation.

In an essay published four years after his death, Michel Foucault (1988) detailed the origins and purpose of certain methods employed since classical antiquity and through Christendom by individuals actively seeking to transform (and enhance) their conduct, bodies, and minds. These "technologies of the self", as he called them, were not technological systems in the contemporary (everyday) sense — i.e., electronic digital instruments — but rather practices or "existential tools" (Verbeek 2011). While it is perhaps not one of the most well-known items in the foucauldian toolkit, over the last years the concept has re-emerged in current analyses of ICTs. Two insightful applications of which are provided by contemporary philosophy of technology, and by the philosophy of information. Despite the methodological differences between these two philosophical strains (the former being largely postphenomenological,[3] and the latter, constructionist)[4] their reinterpretations of what we may now call "technologies of the self" are fairly compatible. Nonetheless, there are important differences between the two postures; namely, the extent to which the (growing) cultural influence of ICTs is affecting human self-understanding. Specifically, whether ICTs are radically transforming human ontologies[5] or merely extending and refashioning them.

This paper does not aim to provide a thorough account of foucaldian theory, nor to critically examine ICTs and their cultural impact in light of Foucault's genealogical method. Rather, by discussing two approaches that expand and repurpose the notion of "technologies of the self", this paper shows how ICTs have opened new dimensions for humans to transform their bodies, minds, and self-conception. It argues that while "traditional" self-modification is being revolutionised and popularised by ICTs, these systems are also exposing us to potent, and unintentional forms of ontological *tinkering*.[6] The paper begins with a short description and contextualisation of Foucault's original idea. The following section discusses Stefano Gualeni's postphenomenological reinterpretation,

1 The term includes any technology used to handle information in one or more phases of its life cycle (Floridi 2009, 228), but in this context it mostly refers to computational (digital) information technologies.

2 For a thorough overview of this movement and the polarising debate surrounding it see Tamar Sharon's (2016) "Self-Tracking for Health and the Quantified Self".

3 Postphenomenology is a "hybrid", pragmatic phenomenology; a "style" of philosophical analysis that focuses on human–technology relations (Ihde 2009).

4 Constructionism here refers to a pragmatist informational epistemology that regards knowledge as something that is actively "engineered" rather than passively acquired (Floridi 2011c).

5 An ontology is here understood as a method for rationally understanding (Poli 2010), describing, defining, categorising, and making sense of entities (and their relationships) within a particular knowledge system (Smith 2004).

6 Tinkering is used here not in the (negative) sense of "meddling", but rather in the sense of "adjust[ing], or work[ing] with something in an unskilled or experimental manner" (Merriam-Webster.com 2017).

and summarises his analysis of the impact of virtual worlds on human ontologies. Next comes an overview of Luciano Floridi's informational account and the reasons why he contends ICTs are changing the fundamental nature of reality. The discussion that follows focuses on establishing whether ICTs are effecting a radical change in human self-understanding, or merely a deepening and fragmenting of our already complex experience of the world. The matters exposed in this paper are hardly going to be solved within the scope of this short account. Ultimately this paper shows how — thanks to current technological developments — Foucault's concept has acquired both renewed interest and a new meaning.

2. SELF-TRANSFORMATION AND TECHNOLOGY IN FOUCAULT

The origins of Foucault's concept of "technologies of the self" are to be found in a seminar he presided at the University of Vermont in 1982; the results of which were published under the same title a few years after his death. At the time, Foucault was embarking on a new line of enquiry that focused on the processes whereby humans "constitute themselves as subjects" (Foucault 1988). He was interested in analysing how individuals consciously seek to gain knowledge of themselves through specific epistemological systems and practices, and then use the resulting insights to modify their behaviour and (ultimately) their sense of self. This project thus represented the "logical conclusion" (Martin, Gutman, and Hutton 1988) of Foucault's previous research on the nature of power and its dynamics in sexuality, mental health, and penology.

In his essay, Foucault identified four "major types" of "'technologies'" (1988, 18), but he conceded that neither of them can actually be found working in isolation. These were (a) technologies of production, (b) technologies of sign systems, (c) technologies of power, and (d) technologies of the self. The latter of which:

> [P]ermit individuals to effect by their own means or with the help of others a certain number of operations on their own bodies and souls, thoughts, conduct, and way of being, so as to transform themselves in order to attain a certain state of happiness, purity, wisdom, perfection, or immortality. (Foucault 1988, 18)

Depending on the historical setting, these practices involved (but were not limited to) sexual explorations or abstinence, fasting, and other dietary restrictions, exercises, praying and meditation, journaling, reading, and epistolary exchanges. Seeing Foucault's definition, "reading moral tales would be as good a match as body piercing or tattooing" (Bakardjieva and Gaden 2011, 401). Foucault characterised these techniques and their objectives as forms of "individual domination" (1988, 19), as means through which people essentially acted upon and controlled themselves. Foucault notes these techniques were originally used by Greek and Roman individuals who saw the "caring of themselves" or the act of "occupying themselves with themselves" as a hermeneutical enterprise with profound ethical and social reach. To them, "taking care" of oneself ultimately implied taking care of the city to which one belonged. With the rise of christianity, the original ethical root of self-actualisation became obscured. The principle of "taking care of oneself" came to be interpreted as a form of selfish immorality and was thus replaced

by the more pious principle of "*knowing* oneself" (1988, 19–20); which in turn became the "prerequisite for self-denunciation" (Bakardjieva and Gaden 2011, 402). Self-actualisation paradoxically morphed into self-renunciation (Foucault 1988, 22), and its driving force was no longer ethical but religious: to align one's soul to the principles of divine will.

Foucault is not usually regarded as a philosopher of technology, yet many of the points he makes in "Technologies of the Self" overlap with both classical and contemporary views from this field (Verbeek 2011; Dorrestijn 2012). "Classical" philosophers of technology such as Ernst Kaap, Martin Heidegger and José Ortega y Gasset (see Mitcham 1994) were among the first to recognise that—to paraphrase Nietzsche—"our tools also affect our thoughts" (cited by Kittler 1999), and hence our understanding of the world. But apart for Kapp—who did not endorse a dialectical opposition between the natural and the artificial worlds (Gualeni 2015) and saw technologies primarily as extensions of human capacities—most of these thinkers portrayed technology in abstract, monolithic, and pessimistic manners. Heidegger (1977), the most influential of them all, famously portrayed technology (and "Western metaphysics") as a limiting, utilitarian force that prevented humans from regarding the world in alternative (e.g., Pre-Socratic) manners. However, in the last decades of the twentieth century philosophy of technology began to experience an "empirical turn" (Achterhuis 2001; Ihde 2009) that identifies "technical mediation" (Selinger 2014; Dorrestijn 2012) as a key and therefore inescapable factor in the construction of human ontologies. Contemporary philosophers of technology hence conceive technology not as an abstract, limiting, and monolithic phenomenon (as their predecessors did), but rather as a modular network of systems which can only be analysed and understood by observing their role within specific human practices. [7]

Philosopher Peter-Paul Verbeek suggests that in Foucault's analyses power plays a comparable (albeit different) role than the one technology played in Heidegger's work: being that which ultimately structures society and culture (2011, 68). Heidegger and other early philosophers of technology contended that the essence of technology had less to do with tools, instruments, and machinery than with a particular (utilitarian) mindset or "attitude" that pervaded every aspect of human life (Mitcham 1994). When talking about technology, Foucault too was not referring to physical instruments; this is evident in the following clarification:

> [W]hat interests me more is to focus on what the Greeks called the technê, that is to say, a practical rationality governed by a conscious goal…. The disadvantage of this word technê, I realize, is the relation to the word "technology,"…. A very narrow meaning is given to "technology": one thinks of hard technology, the technology of wood, of fire, of electricity. Whereas government is also a function of technology: the government of individuals, the government of souls, the government of the self by the self, the government of families, the government of children, and so on.
> (Foucault [1982] 2001, 364)

Foucault does not seem to endorse a fundamental distinction between human and technical dimensions. Technological influence does not necessarily imply a *de facto* negation of human agency and freedom (see Dorrestijn 2012). Like power dynamics, our engagements with technology do not happen in a vacuum, but against a messy and shifting backdrop of objects, institutions, and human

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According to this view, there is not a "technology", but multiple *technologies*. Which means technologies are not intrinsically antithetical to the human spirit —as certain strains of critical theory sometimes imply, nor neutral, but necessarily defined by the circumstances and agents that use them. As Don Ihde puts it, "when divorced from human praxis" instruments are but "junk lying about" (cited in Verbeek 2005, 117).

relations. That is precisely why Verbeek (2011, 67–68) contends that Foucault's stance is also compatible with contemporary philosophy of technology.

During Foucault's lifetime—and apart from the emergence of recording and communication systems such as photography, video, and audio—the available "technologies of the self" continued to be roughly what they had been for millennia: procedures and behaviours; methods that required little or no help from technological instruments. But three decades after Foucault's essay was published the circumstances have changed. As most regions of the world have fully embraced the so-called information society, instruments that enable, accelerate, and deepen self-modification are becoming widely available. Unlike the procedures Foucault described, these are technological systems in the "hard" sense, and with the capacity to influence self-transformation either by design or as a side effect. The following section discusses two interpretations of this shift and its implications.

3. POSTPHENOMENOLOGY: SELF-REFASHIONING AS A CREATIVE ENTERPRISE

In a recently published book, philosopher and video game designer Stefano Gualeni (2015) discusses how, by allowing us to access and to interact with virtual worlds, ICTs can disclose "new human kinds of ontologies."[8] Gualeni's analysis is framed by postphenomenology and media theory; he endorses the notion that humans are "artificial by nature", and regards technologies as a powerful factor in cultural change due to their "inherent" capacity to extend our perceptual, intellectual, and operational abilities (2015, 73). Gualeni suggests that technological development can function as a vehicle for collective and individual self-expression; as a medium for humans to objectify their "worldviews, needs, and aspirations". Therefore, technologies have the potential to disclose "specific forms of self-reflection and self-discovery" (2015, 73). In short, like most philosophers following a postphenomenological approach, Gualeni regards technological instruments primarily as mediators; as systems that shape the ways we make sense of the world and hence, of our own selves.[9]

Gualeni reframes Foucault's notion of "technologies of the self" in terms of *transformative practices* specifically conceived to elicit some type of long-term (and long-lasting) *transformative experience*.[10] Gualeni also reminds us that the ethical principle which—according to Foucault himself—motivated self-improvement practices in ancient Greece was more "projectual" than normative. As Gualeni notes, the guiding question for the Greek citizen was not "'How should I act to be a moral subject' but rather 'What kind of subject do I want to be'" (2015, 74). In other words, people engaged in self-transformation were not merely following an ethical dictum, but engaging in a *poietic* enterprise of "self-design". It is precisely this creative aspect that Gualeni finds most appealing.

Gualeni likens the process of "self-refashioning"—which Foucault characterised as a form of self-imposed power—to the way artists exercise power over their materials to produce an artwork (2015, 75). He suggests that creative projects (e.g., writing philosophical treatises or literary pieces, or designing virtual worlds) can also lead to highly transformative aesthetic *and* existential experiences, not only for the audience but for their creators too. And while video game design is already widely recognised as an activity driven by a "creative urge", Gualeni

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By "ontology", Gualeni means "a rationalisation of a particular worldview, a certain relationship established by a being with reality" (2015, 141).

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It thus stands to reason that from a phenomenological standpoint' *all t*echnologies can—to a greater or lesser degree—be regarded as "technologies of the self".

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Gualeni points out that transformative experiences can also emerge accidentally from circumstances that were not deliberately intended to elicit them.

contends the *poietic* nature of this practice can be exploited for epistemic purposes. He thus notes that virtual world development may be regarded as a self-gnostic *method* through which designers can "realize their own beliefs and conduct, and hence perform ethical and aesthetic self-fashioning" (2015, 76). In summary, Gualeni contends that virtual worlds — and specifically, videogames — are promising tools for *doing* philosophical exploration and reflection. And since digital simulations do not rely solely on passive assimilation and individual imagination, but instead can "objectify" different possible worlds,[11] in certain cases they constitute a more effective medium for critical reflection than traditional media (e.g., writing).[12]

As for the wider cultural impact of current technological developments, Gualeni acknowledges the ubiquity of ICTs — and hence, of virtual worlds — is pushing our ontological frameworks into an increasingly "technically-mediated" context. This shift — Gualeni argues — has important consequences for the way humans understand and categorise their relationships with the world and with themselves. People are now able to "design their lives" not only in the "existential" sense (that Foucault described) but, increasingly, in "biological" (i.e., anatomical, genetic, physiological) and experiential terms (2015, 72). As a result, ICTs "allow human beings to objectify and overcome some of the phenomenological, operational, and ontological boundaries that characterize pre-digital thinking" (2015, 71). Through our daily interaction with these technologies, our traditional (modern) ontologies establish "a reciprocally influential relationship" with digital simulations and hence fragment and extend into formerly inaccessible worlds (2015, 72).

But irrespectively of how profound these shifts might seem, Gualeni contends they are far from being *truly* revolutionary, for they do not necessarily imply a radical break with pre-digital human kinds of ontologies. Gualeni's main point is that virtual worlds are but *idealisations* of existing (actual or imaginary) interpretations of reality, and thus can only offer *alternative* ways of understanding time, space, physical properties and causality. It follows that however otherworldly a given digital simulation might appear, at the most basic level it is only a reformulation, a simple alteration, a reversal, or a recombination of an existing ontology. Secondly, Gualeni notes that human conception of the world is unavoidably constrained by our biology. This implies that every one of our constructs, whether imaginary or concrete, is ultimately a product of one or more human subjectivities. Finally, Gualeni argues digital simulations are necessarily filtered by the ontological architecture of computational technology, which itself is but a manifestation of a particular human form of rationality. In summary, Gualeni claims that while ICTs can expand and reshuffle our conception of reality and of what it means to be human, it is unlikely they could ever allow us completely transcend our human condition.

4. PHILOSOPHY OF INFORMATION: ENVELOPMENT AND THE INFOSPHERE

Philosopher Luciano Floridi, one of the founders and leading proponents of (a constructionist) philosophy of information[13] warns that expecting questions to be solved by a "single, correct, absolute answer, independently of context, purpose, and perspective" (2014, 67) is illusory. Problems are *always* addressed from a given perspective or "interface"; this implies making certain assumptions,

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Meaning, experiences that are intelligible, perceptually stable, self-changing, and interactive.

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Gualeni is careful to note that he is not arguing that writing can be entirely substituted by digital simulations.

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As described by Floridi (2011a, 14), the philosophy of information studies the life cycle, dynamics, and utilisation of information; and elaborates and applies information-theoretic methodologies to philosophical problems.

and compromises about the problem, its components, and its potential solution. Thus, to ask how ICTs are affecting human self-understanding implies at the very least a specification of what "the self" represents and what ICTs are and how they operate. Since Floridi endorses "informational realism"; i.e., the belief that "as far as we can tell, the ultimate nature of reality is informational" (2011a, 361), he contends that "deep down" the nature of brains and bodies, and of minds and selves is *also* informational. That is to say, all of these things may be regarded as "different states of information, or different informational patterns" (2014, 71). Thus, Floridi characterises the self as a "complex informational system, made of consciousness, activities, memories, or narratives" (2014, 69).

Given the former criteria and that, by definition, ICTs are any technology capable of manipulating information, Floridi argues that ICTs "are the most powerful technologies to which selves have ever been exposed" (2011b, 561). In the philosophy of mind — Floridi notes — there is a well-established distinction between personal identities (who we are) and our self-conceptions (who we think we are). In healthy circumstances, both poles reinforce each other. However, our self-conception is significantly flexible and can be affected by both the feedback we receive from other people and by our own idealisations; this is the "social self" (2014, 60). Now, ICTs cannot only influence but also shape "who we are, who we think we are, who we might become, and who we think we might become" (2011b, 550), and they do so mainly by affecting our *social selves*.

In an age where a considerable portion of the World's population frequently uses online platforms to broadcast opinions, tastes, intimate details and experiences, social selves, and therefore personal identities become malleable to an unprecedented degree. If the social conditions of someone's life are changed, if her network of relations, the type — and the frequency — of information she is exposed to, the limits of what she can do and be are also changed, then the way she presents herself to the world is inevitably changed as well. This *projection* reflects back onto her social self, which once again modulates her self-conception and therefore her personal identity (Floridi 2014, 61).

But ICTs can also meddle with our memories; and memory, as Floridi notes, "plays a crucial role in the construction of personal identity" (2011b, 562). Along with communication, one of the core functions of IT — and arguably its original function — is the storage of information. Throughout much of human history, external memory was only available to the few with the ability to read and write. That changed first with global literacy and, later, with the emergence of analogue and electronic "media" (i.e., non-text based ICTs such as image and audio recording systems), and the internet. Through the various platforms and services that allow us to accumulate, upload and share an increasing flow of memories in all sorts of data formats, we are granting ICTs unprecedented power to influence us. As Floridi notes, until recently, the relation between ICTs and the construction of personal identities online had been regarded in rather optimistic terms; it was believed that these technologies would mostly empower individuals by granting them more freedom to choose who they wanted to be (2014, 72). This view has become more nuanced as it is now clear that "the more memories we accumulate and externalise, the more narrative constraints we provide for the construction and development of personal identities" (2011b, 562). In fact, by increasing, objectifying, publicising, and fixating our memories online we are constraining our ability to define (and redefine) ourselves; for the process of "forgetting is also a self-poietic art" (2011b, 262).

As described by Floridi Writing allowed humans to communicate diachronical-ly across time and space (somebody's thoughts could be read at a distance and through generations); electronic communication systems furthered the gap between presence and location by decoupling information from a phy-sical medium (emails arrive instantly).

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Systems that allow us to conceptualise, perceive and measure things that would otherwise remain hidden from the naked eye, including thermo-meters, microscopes, X-rays, fMRI, etc.

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This is an "environment constituted by all informa-tional entities (thus includ-ing informational agents as well), their properties, interactions, processes, and mutual relations" (Floridi 2012, 251). The "infosphere" is neither completely virtual, nor en-tirely physical; it harbours digital, as well as offline and analogue "spaces of information" (Floridi 2014, 59) and therefore it should not be confused with "cyberspace", since this domain is only one of its "subregions".

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As biological creatures, our capacity for adapting to changing environments is many orders of mag-nitude greater than that of (current) technological systems. For instance, re-gardless of how smart our most advanced machines might seem — e.g., neural networks, their ability to function remains over-whelmingly dependent on the contexts for which they were created.

Floridi also contends that ICTs are not only modifying our mental self, but our relationship with our bodies too. Telepresence magnifies the distinction between presence and location that written language inaugurated. [14] Who we are increas-ingly means who we are *online*. Human relations can now happen exclusively through digital mediation. And because the internet does not forget, our virtual selves can become "chronologically disaligned", since digital avatars may outdate but they do not grow old. Furthermore, as ICTs couple with imaging and visual-isation systems, [15] we acquire the ability to "measure, model, simulate, monitor, and manage our bodies ever more deeply, accurately, and non invasively" (2014, 77). Our bodies — to use a programming metaphor — are rapidly becoming white, transparent, boxes.

While a significant portion of the changes brought by ICTs involves some form of virtual environments, our physical world is also being reshaped. Over the last half century, thanks to the growth and development of computational technology our informational environment or "*infosphere*" (Floridi 2010) has been expan-ding. [16] Meaning that not just communications and entertainment, but every aspect of human life — such as social interactions, businesses, education, transporta-tion, healthcare, governance, law enforcement, etc., is being integrated into our digital environment. The infosphere is rapidly becoming our default habitat — the world were we live in; hence, our conception of reality is becoming increas-ingly more dependent on informational frameworks and tools.

But instead of fitting our technologies to the pre-existing limits of our world, we are adapting both our environment *and* ourselves to our increasingly more complex ICTs. [17] Our technologies are *educating* us as users. This integration involves a greater "*envelopment*" [18] of our physical world (Floridi 2012). Envelopment, Floridi argues, "used to be either a stand-alone phenomenon" (e.g., a dishwasher, which is a machine built around an enveloped "micro-environment") or one cons-trained to a particular space (a car factory filled with hundreds of robots). How-ever, the ubiquity of cell sites (cell towers) and WiFi hotspots has enveloped and transformed our physical environment, making it a more technology-friendly place where our also ubiquitous smart devices can gather, transmit, and pro-cess vast amounts of data on a permanent basis (2012, 252). Thus, in the words of Floridi:

> Enveloping is a trend that is robust, cumulative, and progressively refining: everyday sees the availability of more tags, more humans online, more do-cuments, more statistical tools, more devices that communicate with each other, more sensors, more RFID tags, more satellites, more actuators, more data collected on all possible transitions of any system, in a word, more enveloping. (Floridi 2012, 252)

This is what has allowed an otherwise purely syntactical — and hence semantically incompetent — technology to become so powerful as to be considered "smart".

Enveloping is closely tied with another fundamental change triggered by IT, which Floridi calls "*re-ontologising*". He claims that by adapting ourselves to — and hence making sense of our world through information technology — we are implementing "a very radical form of re-engineering… that not only designs, cons-tructs or structures a system… but that fundamentally transforms its intrinsic nature" (2012, 251). According to him, ICTs allow us to access different possible worlds — e.g., cyberspace and digital simulations which, thanks to ongoing devel-

An "envelop" or "reach envelop" is a term borrowed from robotics, and it refers to "the three-dimensional space that defines the boundaries that the robot can reach" (Floridi 2012, 251).

opments in virtual reality systems, are becoming more sophisticated. This possibility implies a shift from a materialist (Newtonian) understanding of reality to an informational (digital) one. Hence, the precondition for existence is no longer immutability (as the Greeks believed) nor perception (as modern metaphysics contended), but *interaction*, regardless of tangibility (Floridi 2010). Secondly, envelopment is blurring the distinction between offline and online environments. Reality is being progressively enhanced as our physical habitat merges with the abstract world of cyberspace. Finally, ICTs allow us to interact not only with other human agents, but also with "a-live" (artificially alive) agents (Floridi 2010), from "bots" to a growing panoply of smart appliances.

5. DISCUSSION: CONTRASTING THE TWO APPROACHES

In Section 3 we saw Gualeni claims the "core" of ICTs' cultural impact is that they allow us to access different possible worlds, and that our exposure to digital simulations is fragmenting and expanding but not radically transforming our pre-existing ontological frameworks. The premise being that, despite their objectified and otherworldly nature, virtual worlds are *always* designed for and experienced by human wetware. Hence, the ontologies they disclose are not (cannot be) fundamentally different from those found in real life, only distorted versions of them.

Given the previous assumptions, it is fair to ask what would it take for an ontological change to be deemed *truly* radical? Gualeni does not offer detailed criteria but he does mention that transcending traditional ontologies implies a change that is "alien and incompatible" (2015, 164) with every possible way in which *humans* experience the world. In other words, a radical alternative ontology should be utterly inapprehensible for a human mind — i.e. it should be a rationalisation of a worldview accessible only to some type of "conscious exotica" (see Shanahan 2016).

Clearly, Gualeni has set the bar high, but the fact that the very definition of "human" is (and presumably will continue to be) an open question does leave some room for ontological tinkering. ICTs will allow us to simulate and *experience* even the most bizarre alternative worlds we can imagine, and with growing levels of fidelity — more so now that new generations of VR technology are becoming available to more people. Furthermore, due to their informational nature, computational simulations are (at least theoretically) "permanently extendible" and "deeply remixable", which means virtual worlds cannot only be expanded, updated, and rewritten, but that they are also prone to "hybridisation" (see Manovich 2013).

The higher the number of available virtual worlds, the more we become prone to interact with them, and the larger the sources for imagining and constructing even stranger ontologies. Yet — granting the truth of Gualeni's arguments — even the most exotic ontology we could imagine would *still* be of human origin. It follows that while ICTs can indeed help us to experience, reimagine, and tinker with alternative ways to be a human subject — i.e., to function as "technologies of the self" — they cannot assist us in *transcending* our humanity.

However, does an ontological change need to be "alien and incompatible" with pre-existing human frameworks in order to be truly revolutionary? Sometimes, seemingly small shifts can lead to long-term, unpredictable, and radical changes, particularly when dealing with complex nonlinear systems.

Arguably, our worldviews are not the sole product of our minds, as embodied creatures, our *circumstances*—as Ortega y Gasset ([1914] 1966) argued—also play a crucial role in informing our experience. Extrinsic changes (in our environment) affect us intrinsically; they reflect back onto our self-understanding, and often in unpredictable ways. And ICTs, as Floridi showed, are doing precisely that: changing our environment in seemingly subtle and yet potentially radical ways.

The envelopment of our physical reality, along with the ubiquity of computational appliances is turning the distinction between "onlife" and our Newtonian reality anachronistic. Cyberspace is no longer just an alternate world which we enter and exit at will, but has gradually turned into a permanently available and (for some people) more socially active layer of our lives; an extension, of our existential reality. Whatever we do online can now directly influence our physical selves, and vice versa. What happens in virtual worlds does not stay in virtual worlds. By *re-ontologising* our environment, ICTs are indirectly shifting the "way we understand and rationally organise our experience of the world"; and in the process, they are also shaping our self-conception. And yet, while this process is not as spectacular as what certain dystopias—such as *Blade Runner, Neuromancer, or The Matrix*—have suggested, the ontological implications are in no way trivial.

ICTs are allowing us for the first time in history to develop and interact with non-biological "smart" appliances[19]—"intelligence" remains a strong word. But regardless of how unsophisticated these technologies might still be, their role in human affairs is growing exponentially. Recent developments in machine learning—and particularly in Artificial Neural Networks (ANN)—have made these systems better at guessing and influencing our wishes, recognising our faces, beating chess and Go grandmasters, buying and selling stocks, helping to make healthcare decisions, etc. And while computational technology is indeed (as Gualeni claims) the materialisation of a particular form of human rationality—i.e., logic and mathematics—and this would imply in principle that AI stands on the same ontological plane as human intelligence, the reality is more nuanced. Specifications do not necessarily entail implementation, particularly when dealing with complex systems with multiple interdependencies. Problems such as (the lack of) interpretability (see Bornstein 2016) of ANNs raise questions about the possibility of algorithmic thinking being similar, or even comparable to human thinking. The potential emergence of "strong" AI would arguably lead to a radical shift in the way humans think of themselves. As it would not only mean that we would stop being the only intelligent agents on the planet (at least by human standards), but that we might be dealing with potentially *exotic* intelligences.

Yet, any argument concerning (strong) AI and its impact on human affairs is, by definition, speculative. There is still an enormous gap between what we may call the "technoscientific reality" (or implementation) and philosophical propositions and critiques. The fact is, we do not know, nor can we predict how a given technology might affect (either positively or negatively) our existence both physically and ontologically. What we can do—as contemporary philosophers of technology and Foucault propose—is focus on how certain technologies incide over specific practices and human contexts.

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Surely humans have engaged in animism for thousands of years. But unless we believe in magic, it is difficult to concede that, for example, a (horseless) carriage might have transported its occupant for 32 Km to receive a bloodletting, or that a medieval scholar could put out a candle by simply uttering a voice command.

6. SOME IMPLICATIONS

Much of what we are or rather, of what our social selves are has been incorporated into what Floridi calls the "infosphere". This has happened out of our own volition but also without our knowledge or consent. We all have some form of data trace; either directly or indirectly linked to us. Having a birth certificate or some other form of registry in a government institution, having a bank account, using the internet, owing and using a mobile phone, and so on and so forth; all of these things are part of our informational selves. Our social self is now more available, more interpretable, and more editable than ever. The life-narratives of many people (whether accurate or not) stand one "googling" away.

Our social selves are therefore, potentially subject to change. And the truth is, we do not need hacking skills to accomplish it. We can edit, curate, and tinker with the information that is available about ourselves. Whenever we access social platforms and interact with other people, whenever we add content to our personal websites, whenever we use the internet we are constructing and modifying our social selves. Who we are is also who we are on Facebook, on Twitter, on Researchgate, on our Faculty's website, on our publication record. Tinkering is adjusting, changing, experimenting without doing so systematically. We tinker with our profiles, we choose and edit our selfies, we make opinions available. It is tinkering because the result is not always foreseeable, a bad joke taken out of context can have dramatic consequences for our professional life and our emotional health. This is what it means to say that our physical habitat is merging with the abstract world of cyberspace.

Although the techniques Foucault had described were employed by individuals living millennia ago, humans have never stopped seeking to enhance themselves. People today exercise power and control over themselves to develop more attractive bodies, to follow healthier lifestyles, to live ethically, to be more productive, or even to transcend the limits of their human condition. Dietary fads and movements (from "good food" and craft beer to veganism and juicing), exercise routines (from yoga to CrossFit), productivity methods (from time-boxing to standing desks), mindfulness and meditation; all fit within Foucault's original concept. We may even argue the current tendency of self-actualisation is returning to the classical principle of "taking care of one self". What has changed are the specific goals behind human desire for self-transformation, along with the availability and the complexity of the tools designed to achieve it. Foucault's concept is not only current, but can easily be employed to categorise the new generation of instruments and techniques of self-transformation and enhancement.

Yet, our current technologies of the self are not *only* those specifically designed for that purpose (i.e., wearables, tracking devices and services). As we saw in the previous discussion ICTs can have profound impact on the way humans present themselves to themselves. Physiologically speaking humans might have not changed that much over the last two thousand years, but from a socio-cultural and technological standpoint the changes have been dramatic, particularly those that occurred within the last fifty years. By allowing us to interact with virtual worlds, ICTs have opened a whole new dimension in which we may speak of self-actualisation, more so when the things that happen in those virtual worlds have direct consequences on physical reality. Self-enhancement is no longer carried out at physical or mental levels, but at informational levels too.

The two analyses discussed in sections three and four are not incompatible, but they do differ in some important aspects. Both provide insightful reformulations of Foucault's concept to address the cultural impact of ICTs. Some of the arguments underpinning Gualeni's cautious assessment of the ontological impact of ICTs are debatable—particularly the one concerning the human imprint of computational technology—but his reinterpretation of self-fashioning as a *poietic* process is rather insightful. Particularly for the analysis of contemporary aesthetic practices involving radical body design and posthuman performance. Whereas Floridi's framing of selfhood in terms of informational systems offers a non psychologistic explanation of how ICTs can meddle with our self-understanding. The notion that humans *are* their information (from their genetics all the way up to their mental states) is conceptually illuminating and methodologically valuable. In the end, it seems the tension between Floridi and Gualeni has more to do with the level of abstraction each of them is proceeding from.

7. CONCLUSIONS

Foucault's notion has acquired new meaning and relevance in the midst of the ongoing technological shifts. There are at least two senses in which we can speak of "technologies of the self": Foucault's original practice-oriented notion, and its contemporary materialisation. What in Foucault's time were deliberate operations, in our current context are also the unintended consequences of our daily interaction with technology. ICTs are re-ontologising our context and therefore profoundly altering how we conceive and shape our sense of self. The introduction of these systems is "disruptive" in positive and negative ways. ICTs can become potent agents of change within social and economic dynamics, but they can also bring problems we have not yet imagined. Whether ICTs are ultimately changing what it means to be human remains an open question but meanwhile they are allowing us to tinker with our identities in ways that are truly unprecedented.

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