Cyborgs in an Augmented World

Towards the Deconstruction of Dualistic Thinking in the 21st Century

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Abstract

The increasing ubiquity of computer technology and the advent of social networking websites have created a new fusion of the physical and the digital world. This technological shift has given rise to a discussion in new media research, calling for the necessity of a new framework in the study of the human-technology relationship. This framework should reject the preservation of the dualistic thinking which has dominated our understanding of this relationship, since the first traces of the involvement of machines into our lives. This thesis seeks to contribute to this discussion by showing that a new perception towards technology is already apparent in recent science fiction texts on the merging of human and digital technology. Indicative narratives from novels and films of the late 20th century are compared with corresponding texts produced since the beginning of the present decade, in order to show this shift which has taken place in our technological imaginary. The findings from this comparative analysis are then related to the earlier theories of posthumanist criticism of the 1990s, which had called for the construction of a new figuration of the posthuman, which recognises our cyborg nature as hybrids of human and machine.

It is argued that this figuration is appearing today in contemporary popular culture and this intensifies the necessity for the construction of a new framework which uses as a starting point the acknowledgement that we are already cyborgs in a world which combines the offline and the online, the digital and the physical: an augmented world.

Keywords

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1. Introduction

1.1. The technological world in the 21ˢᵗ century

The acquisition of superhuman powers, the discovery of a digital "promised land", the achievement of immortality: in the late 20ᵗʰ century, the great changes which were brought about in society by the computer revolution triggered the popular imagination. The rapid technological advancements of the 1980s and 1990s created hopes and fears about a future where the human species would be replaced by superior human-machine entities, who would be able to cross the borders between the virtual realm and the real world. This idea was depicted in popular culture, most significantly in the genre of science fiction, with the image of the cyborg, a hybrid of organism and machine.

During the last decade, the world has witnessed a new shift in the involvement of computers in our lives. Information technology is becoming increasingly ubiquitous, transcending the desktop and entering our bodies and our surrounding environment. Tiny sensors are embedded in everyday objects, placed on our skin through wearable devices or even implanted beneath it, connecting our bodies to external digital devices. At the same time, the way we use the web has changed due to the social media revolution. As it is further explained in the following chapter, our online activity increasingly reflects our physical world interactions and, simultaneously, our offline social activities are influenced by our online behaviour. These advancements seem to be bringing us closer to the fulfilment of the fantasies of the late 20ᵗʰ century, when computer technology was envisioned as something which would abolish the restrictions of nature by connecting us to a virtual world where everything is possible. However, there seems to be an unforeseen shift in the way the merging of human and technology is depicted in contemporary popular imagination. A shift which is of great importance, not only for the way we envision technology, but also for the way we perceive the human self and the world around us.

Science fiction narratives signifying a new era for the human species are based on a binary understanding of the world that has dominated traditional Western thought. In regard to social reality, this is formed through a set of binary oppositions, such as male/female, human/nonhuman, in which, according to philosopher Jacques Derrida, one category is usually favoured against the other, creating hierarchical power structures (Derrida, 1981: 41). Such binaries, as it is more explicitly analysed later on, are apparent in popular culture

narratives about technology, produced in the 1980s and 1990s. They reveal the persistence of a dualistic thinking in our perception of the relationship between human and technology: the human is perceived in opposition to the nonhuman, the natural in opposition to the artificial etc. In "A Cyborg Manifesto", written in 1991, sociologist Donna Haraway envisioned technology as an opportunity for liberation from the hierarchy of traditional humanist binaries, which have important social consequences, resulting in divisions and inequality (Haraway, 1991). Following Haraway, posthumanist criticism in the late 20th century called for a deconstruction of dualistic thinking in narratives depicting our relationship with technology. In *How We Became Posthuman,* literary critic Katherine Hayles emphasized on the necessity of forming a new posthumanist point of view. "Although some current versions of the posthuman point toward the antihuman and the apocalyptic, we can craft others that will be conducive to the long-range survival of humans and of the other life-forms, biological and artificial, with whom we share the planet and ourselves" (Hayles, 1999: 291).

In this thesis, I argue that these new "versions of the posthuman" seem to appear today in contemporary popular culture, reflecting the ontological shift that posthumanist critics predicted in the 1990s. The recent advancements in digital technology have blurred the boundaries between the natural and the digital, between the online and the offline. My hypothesis is that this change is portrayed in contemporary science fiction, where a new verbal and visual vocabulary is being used to depict the blending of human and technology. Science fiction authors seem to envision digital technology as an integral part of real world activities and social life, as opposed to the idea of technology as something foreign and separated from the real world in narratives of the previous century. I aim to trace this shift in indicative popular culture narratives and analyse them in relation to the earlier theories about the deconstruction of dichotomies which dominated Western philosophy. Therefore, the question that I will attempt to answer with this thesis is two-fold: how is the merging of human and technology envisioned in contemporary science fiction, in contrast to how is was envisioned in the early years of computer technology? And, is this shift on the level of cultural production, indicative of a larger ontological shift in the way we perceive the human in a technological world today?

1.2. Methodology/ Outline

In order to answer these questions, I approach my research as follows: first, I recount how, in the 21st century, computer technology has gradually migrated from the desktop into

the human body and its surrounding environment, keeping us connected to a digital network anywhere, at any time. This technological shift has recently triggered a new discussion in the field of new media studies, which calls for the construction of a theoretical framework that acknowledges the increasingly blurring boundaries between the digital and the physical, between the online and the offline. I then relate this newly introduced discussion to an older debate which appeared in cultural studies almost two decades ago. In order to do so, I conduct a literature review of relevant posthumanist criticism, focusing on the work of Katherine Hayles. Posthumanist criticism was grounded on Donna Haraway's "Cyborg Manifesto" and called for the deconstruction of traditional dichotomies which have dominated the Western understanding of the world.

In the next chapter, I attempt to locate traces of the aforementioned deconstruction in popular culture. I, therefore, conduct a critical discourse analysis on the posthuman figuration in Western science fiction narratives, looking at how this figuration is constructed in texts produced in the late 20th century and how this construction has changed in contemporary sources. My intention is to show that in the former depictions of the posthuman, one can discern certain power relations which reveal the dualistic thinking of Western philosophy: technology is presented as something separated from the fictional "real world". In contrast, binary oppositions in the presentation of the human-technology relationship are gradually vanishing in contemporary science fiction texts, which present the world as an "enmeshed" entity of nature and technology. In order to make these power relations visible, my discourse analysis is developed in the way that it was introduced by Michel Foucault, as one of the most significant philosophers to show the role of discourse in the construction of reality. In *Discipline and Punish*, Foucault shows the two-fold relationship between power relations and knowledge:

"We should admit rather that power produces knowledge (and not simply by encouraging it because it serves power or by applying it because it is useful); that power and knowledge directly imply one another; that there is no power relation without the correlative constitution of a field of knowledge, nor any knowledge that does not presuppose and constitute at the same time power relations" (Foucault, 1995: 27).

In critical discourse analysis, power relations are being examined through language: "language indexes and expresses power, and is involved where there is contention over and a challenge to power. (…) language can be used to challenge power, to subvert it, to alter

distributions of power in the short and the long term" (Wodak, 2009: 10). Language can be detected in written, spoken, visual and other modes of communication which constitute discourse. The source material of my textual analysis consists of science fiction novels and films from two different chronological periods: the first consists of sources derived from the 1980s and 1990s and the second consists of corresponding texts produced in the last decade. According to journalism professor Bonnie Brennen, "[r]ather than only judging the strengths, weaknesses, accuracy or inaccuracy of texts, qualitative researchers look at the social practices, representations , assumptions and stories about our lives that are revealed in texts" (Brennen, 2013: 193-194). Based on this procedure, I look for continuities and raptures between narratives of the aforementioned periods, concerning the way they depict the future relationship of the human body to the virtual space, as well as the emotions which are implied to accompany the characters' navigation in and out of the digital domain.

Several scholars have noted the significance of the language of science fiction texts in the examination of the discourses surrounding technological advancements. For example, film and media studies professor, Scott Bukatman, has argued that science fiction not only represents the way we perceive those advancements, but it has also given rise to a new subjectivity created inside the pages of this genre. He calls this subjectivity "terminal identity" and he defines it as "a form of speech, as an essential cyborg formation, and a potentially subversive reconception of the subject that situates the human and the technological as coextensive, codependent, and mutually defining" (Bukatman, 1993: 22). The particular works, produced in the 1980s and 1990s, which will be examined are considered indicative because of the effect they have exercised on technocultural discussions. William Gibson's *Neuromancer* introduced the concept of the "cyberspace" (Gibson, 1984) and Vernor Vinge's *Marooned in Realtime* (Vinge, 1986) introduced the concept of the "singularity", which both, as it is explained, extracted science fiction and permeated technological discourse. Attention will also be given to several popular science books written by futurists such as Ray Kurzweil and Hans Moravec, on the grounds that they played a significant role in the configuration of the popular imaginary. Posthuman narratives from these texts will be examined in comparison to corresponding concepts from contemporary sources. Although they are fairly recent to have influenced technocultural discussions, these texts have still been chosen for this research because they are indicative of this new figuration of the posthuman which I argue is being formed today. The main works which will be analysed are *The Rapture of the Nerds*, an apocalyptic science fiction novel by Cory Doctorow and Charles Stross (Doctorow, 2012), and *Black Mirror,* a British television series broadcast by Channel 4 (*Black Mirror,* 2011).

The findings from the aforementioned textual analysis are discussed in the final chapter. First, I embed the dominant themes of the depiction of the posthuman, discerned in the narratives derived from the former period under investigation, into a comparative analysis with corresponding themes from science fiction stories produced in the last decade. I do so in order to show the change which I argue has taken place in the imaginary of the human-technology relation in science fiction. I intend to show that in our technological imaginary today, the cause of anxiety or of utopian expectations is not technology itself, but rather the ways we choose to exploit its possibilities. Finally, I elaborate on how these findings can be interpreted as contributing to a larger ontological shift. I argue that the new perception of the human-technology relationship which is appearing in science fiction can be indicative of the formation of a new understanding of the human self and the technological world around it, which seems to surpass dualistic thinking.

2. The blended boundaries between technology and the human

More than twenty years ago, Mark Weiser, the chief technology officer at Xerox's Palo Alto Research Center, was arguing that, in order for computer technology to achieve its full potential, it would have to "disappear" in the background of our everyday life. In his famous article "The Computer for the 21st Century", he predicted that human-computer interaction (HCI) would soon go beyond the personal computer era, where each person can access digital life through one single screen on a desktop. Instead, Weiser stated that we would soon have "hundreds of computers in a room", integrated into the world around us in such a way that we would not notice their presence, but rather "use them unconsciously to accomplish everyday tasks" (Weiser, 2002: 21). Those computers would be "interconnected in a ubiquitous network" (Ibid.: 20), not in the sense of a network of devices which could be carried everywhere, but in the sense of computer technology embedded in any object and easily used from any place.

Weiser ends his article with an imaginary scenario set in a futuristic world, following a usual day in the life of Sal, where intelligent technology is embedded in her environment in order to make her personal and professional life more efficient (Ibid.: 24-25). Although this scenario still seems today like something torn out of the pages of science fiction, it is without a doubt that the current technological developments suggest a new, significant step in HCI. Our physical environment is being increasingly filled with sensor-based devices, making it possible for people to move away from the desktop. Computer technology is gradually entering any place people can think of. What Mark Weiser was envisioning more than two decades ago is becoming a reality: computers are becoming smaller and smaller, almost "disappearing" in the background of our life, suggesting a new paradigm which Adam Greenfield, founder of urban systems design practice Urbanscale, has described as "everyware" (Greenfield, 2006: 17).

The expansion of digital technology beyond the desktop seems to be fulfilling age-old fantasies for the overcoming of the limitation of human communication, of our restricted access to information and our natural senses. The computer revolution in the 1980s and the popularization of the internet in the 1990s, as it is shown later on, had sparked a wave of enthusiasm about the creation of a virtual space inside which we would acquire superhuman capacities. The practice of attributing utopian expectations to new technologies is as old as the history of human. According to media scholar Imar de Vries, "[i]t is what the new does: it perpetually gives our technological imaginary, our yearning for wholeness and completeness

that is projected upon technology, fresh impulses by portraying existing technologies as inadequate, and, in the same way, by introducing us to the next big thing as a solution" (De Vries, 2012: 165-166). At this point, I have to clarify what is meant by the concept of the "imaginary". In the way that it is being used in this thesis, the term stems from the psychoanalytical theory of Jacques Lacan. The French psychoanalyst defined the "imaginary", along with the "real" and the "symbolic", as the triptych of the orders of experience (Lister et al., 2009: 67). When used in new media studies, the technological imaginary signifies "the way that (frequently gendered) dissatisfactions with social reality and desires for a better society are projected onto technologies as capable of delivering a potential realm of completeness" (Ibid.).

Based on this definition, one can easily explain the excessive expectations that the increasing pervasiveness of information technology has brought along. For example, "having a wireless communication device like a mobile telephone at one's disposal implies having access to ever-present, real-time communication channels, and thus to the means to engage in dialogue or to disseminate information whenever and wherever one wants", notes de Vries (De Vries, 2009: 83). At the same time, contemporary technological advancements seem to be offering us superhuman capacities by literally connecting our bodies to an external digital network, through microchips embedded in wearable devices or even implanted inside our skin. Greenfield refers to the human body as the most fascinating frontier opening up for integration with computer technology: "as both a rich source of information in itself and the vehicle by which we experience the world, it was probably inevitable that sooner or later somebody would think to reconsider it as just another kind of networked resource" (Greenfield, 2006: 48). Today, information technology can be immediately applied to the human body through mobile communication devices, wearables, microchip implants and various other channels. The unconscious use of invisible computers that Weiser was describing has been rendered possible by the tiny sensors which are inserted in smartwatches, wristbands and eyeglasses, placed on the skin or beneath it. The constant connection of our bodies to a digital network has lead to a fusion of the online and offline, calling for a new perspective in the examination of digital culture in academic discussions.

2.1. The new fusion of atoms and bits

In the 21st century, mobile technology and the revolution of social networking websites have created a new merging of the physical and the digital world. This condition has lately

drawn attention in new media studies; significant work in this direction has been conducted by Marianne van den Boomen et al. in *Digital Material*, where the authors argue that new technologies should be examined from a "digital-materialist" perspective (Van den Boomen et al., 2009: 8), in contrast to the more deterministic approach of the past, which perceives the online realm as something separate from real world social activity. Social media theorist Nathan Jurgenson proposes the examination of new technologies through the lens of an "augmented reality", which acknowledges the increasingly blurring boundaries between the physical and the digital (Jurgenson, 2012).

However, the aforementioned scholars note that a dualistic perspective is still apparent in the discourse on new technologies. Van den Boomen et al. show that academic discussions still depict the effects of new media as a shift "from the material to the immaterial", without recognizing digital technology as something which cannot exist separately from the physical world which surrounds it (Van den Boomen et al., 2009: 8-9). Jurgenson criticizes the trend to view the online and the offline as separate spheres, a trend which he calls "digital dualism" (Jurgenson, 2012: 88). He stresses that examples of dystopian and utopian depictions of new media are still strong not only in academia but in popular culture as well. My aim, however, is to show that this dualistic thinking is gradually decreasing in popular imagination, by comparing early depictions of the fusion of human and technology in science fiction to the way they are presented in the 21st century. But first I wish to elaborate more on this new blending of atoms and bits which is suggested by recent technological advancements. I want to focus on a particular field which has just started to gain academic interest: the effects of technologies which are immediately connected to the body, such as wearable devices or radio-frequency identification (RFID) implants. I am specifically interested in these advancements, because I am curious to see how they can be connected to the imaginary of the cyborg, which dominated popular culture in the late 20th century.

In the 2010s, the invasion of computer technology to the human body has been a prevalent topic in popular technology and academic discussions. The concept is not something new; experiments in wearable computing and chip implantation begun in the early years of information technology. One of the pioneers in wearable technology is computer engineering professor Steve Mann, who begun augmenting his body with electronic devices from his teenage years (Mann, 2001: 12). His aim, as he explains in *Cyborg: digital destiny and human possibility in the age of the wearable computer*, has been to investigate how we can critically use the rapidly evolving technologies while being aware of the effect that our actions will have on ourselves and the world around us:

"By exploring what it means to be a human being permanently connected to a computer, I have made a choice as to which road I would like to walk. As someone who refuses to deny the attraction, the strange beauty, of expanded human potential through wearable computer prostheses, I am seeking to demonstrate that the individual can have a role in shaping the coming cyborg society" (Mann, 2001: 3-4).

One of the projects which the inventor is mostly acclaimed for is the development of the EyeTap digital eye glass system, a device which is worn in front of the eye and acts "both as a camera and a display with text and graphic capabilities" (Mann, 2001: 9). Mann himself has been wearing a digital eye glass device permanently embedded on his skull for more than a decade[1]. The device allows the user's eye to function "as if it were both a camera and display, by mapping an effective camera and display inside the eye" (Mann, 2004: 1). In this sense, the EyeTap system makes it possible for the user to continuously capture what their eyes see and share them with an audience from a first person perspective. This possibility led Steve Mann to invent the practice of "cyborglogging" (or "glogging"): "the (usually continous) recording of an activity by a participant in the activity, which often results in the serendipitous capture of precious moments, such as the birth of a newborn baby" (Ibid.: 5).

Another pioneer in cyborg technologies has been Kevin Warwick, particularly renowned for his Project Cyborg experiment, which he extensively describes in his book *I, Cyborg* (Warwick, 2004). In 1998, he had a RFID transmitter implanted in his arm, which allowed him to control computer-connected devices, such as lights and doors (Warwick, 2004: 73-89). Four years later, he extended his experiment with a second phase, during which he managed to control a robot arm by sending signals from his own nervous system through a computer (Ibid.: 232-236). While the success of his experiment could result in notable advancements in robotic prosthesis for people who have lost a body part, Warwick was mostly interested in enhancing the limited senses that humans are granted by nature: "a cyborg", he writes, "can (…) sense the world anywhere the internet can take them" (Ibid.: 264). In a subsequent extension of this experiment, together with his wife, they became the first couple to acquire nervous system to nervous system communication (Ibid.: 282).

However, "real-life cyborgs" are not limited to computer engineering professionals. On the other side of the spectrum, there is a growing underground community of do-it-yourself amateur experimenters, popularly known as biohackers (Popper, 2012). One representative

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1   For further information, see Steve Mann's blog post on 17 July 2013, where he introduces his work before describing the physical assault he was subjected to for wearing the digital eye glass system in a McDonald's restaurant (http://eyetap.blogspot.nl/2012/07/physical-assault-by-mcdonalds-for.html)

example of this community, who has received attention from popular media, is Lepht Anonym, a British biohacker based in Berlin. Lepht has been experimenting with the enhancement of her senses by performing self-surgeries in order to insert various sensors under her skin. One of her first achievements was implanting RFID implants which allowed her to unlock personal computers (Borland, 2010).

While such examples of extreme body modification through technology might still be in an experimental stage and far from becoming a mainstream practice, today wearable computing is being commercialized by some of the biggest technology corporations. The Google Glass[2], an augmented eyewear device which allows users to take pictures and record videos without using their hands, to surf the internet and access their online accounts by voice commands, send and receive messages, among other activities, has dominated popular technology media long before the announcement of its release date. Similar speculations have accompanied the Apple iWatch, a wristwatch device which will be able to undertake the functions of a smartphone (Burrows, 2013). These are only two significant examples from a variety of devices which have come to signify the widespread adoption of wearable technologies in everyday life. As Greenfield had predicted, we are already heading into "a world in which the body has been decisively reimagined as a site of networked computation" (Greenfield, 2006: 53).

Such devices give us the ability to monitor ourselves and transmit our personal data, thus connecting our body to a network of external digital technologies (Swan, 2012: 218). Wearable cameras allows us to record what we see and share it online in real-time; multi-sensor wristbands, such as the Nike+ Fuelband[3], allow us to track our physical activity and upload our data on online platforms. Such features have lead to the development of the practices of self-tracking and life-logging. According to sociology professor, Deborah Lupton, wearable digital devices such as the Nike+Fuelband can be used for the collection of personal data about the user's bodily functions and activity, in the context of self-improvement (Lupton, 2013: 2). This data can be e-mailed or uploaded to the user's social media profiles, in order to be shared with their contacts (Ibid.). Regarding life-logging, it is the automatic capture of our everyday activities through digital devices, which allow us to store the recorded content as well as its featured details (Sellen, 2010: 72). For example, the Memoto[4] wearable camera automatically takes pictures every 30 seconds, processes them online and then uploads

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2   More information on Google's promotional site for the Googl Glass (http://www.google.com/glass/start/what-it-does/)
3   Nike's promotional site for the Nike+ Fuelband: http://www.nike.com/cdp/fuelband/us/en_us/
4   For more information about the Memoto wearable camera: http://www.slashgear.com/memoto-hands-on-life-logging-with-kickstarters-wearable-camera-05285100/

them into "Moments", a mobile application, where the user can view them and share them in social media.

It becomes apparent that such practices contribute to the tremendous increase of data about ourselves which are available online. This fact is particularly significant for the examination of the new fusion of human and technology in the 21st century. The shift that has taken place in the way we use computer technology today is not limited to mobile applications, wireless connected devices and RFID implants. During the last decade, there has been a significant change in the way we use the web, mainly due to the revolution of social networking sites (SNS). According to a Pew Research Center report which was published in 2011, examining the impact of the widespread use of SNS, there is a two-fold relationship between our social media activity and our activity on the offline world. Our SNS profiles are mainly based on our physical world social networks and, at the same time, our offline world interactions are increasingly influenced by our behaviour on SNS (Hampton et al., 2011). Adding to this the large amount of data which we upload to these websites from our everyday activities, our memories and bodily functions, it could be stated that computer devices which connect our bodies to the internet intensify the fusion of atoms and bits on a second level, blurring the boundaries between the online and the offline world.

As I have mentioned above, I am particularly interested in looking at how this fusion of human and digital technology is affecting the technological imaginary today. I consider this an important research topic, as it can reveal interesting insights about how our understanding of the human self in a technological world is being shaped by the advancements of technology in the 21st century. But first, I need to place my research inside the frames of an age-old discussion about the human-machine relationship. More specifically, I will now introduce the posthumanist criticism of the 1990s, which saw computer technology as an opportunity for the deconstruction of the dualistic thinking which is cause for social oppression in the Western world.

2.2. The cyborg in cultural criticism

The Industrial Revolution of the late 18th- early 19th century caused a great change to the Western society. For the first time in history, people were being replaced by machines in factories, which could automatically do their work for them. Large numbers of workers lost their jobs and, as a result, the rapid technological evolution started to be envisioned as a menace. The fears that this change brought about were depicted in the cultural production of that time. In 1818, Mary Shelley wrote *Frankenstein,* which is considered by many critics to

be the first science fiction novel (Freedman, 2000: 4). The protagonist, scientist Victor Frankenstein, impelled by his desire to discover the secret of life, conducts a secret experiment, trying to create a human being by connecting inanimate body parts and bringing them to life (Shelley, 1996). His experiment soon gets out of control, when the creature commits a series of murders. The novel is still examined today in digital culture studies, as a significant example which depicts the first traces of the idea of a human-machine entity, brought to life by science and technology. This concept was soon explored by film. In 1926, Fritz Lang's *Metropolis,* also considered a pioneering science fiction film, the eccentric inventor Rotwang creates a humanoid robot in order to resurrect the love of his life (*Metropolis,* 1926). The robot is then used to spread chaos in the city of Metropolis, encouraging the workers to "kill" the machines that uphold it.

Several decades later, the computer revolution signified a new era in the involvement of machines into our lives. The technological advancements triggered discussions about the increasing merging of human and machine. This unprecedented shift in society triggered the development of the image of the cyborg in science fiction, in order to signal that "there is no longer a 'partnership' between machine and organism; rather there is a symbiosis and it is managed by cybernetics, the language common to the organic and the mechanical" (Gray, 1995: 4). The term, which stands for "cybernetic organism", had already been coined in 1960, when Manfred Clynes and Nathan S. Kline used it in their famous article "Cyborgs and Space". The two scientists attempted to provide a solution to the question of how man could survive in space. Instead of creating an environment which would provide humans with the necessary conditions, Clynes and Kline suggested the making of "self-regulating man-machine systems" which would have technologically enhanced abilities, so that they could control their bodily functions and adopt to the new environment themselves (Clynes, 1960: 27). As the two authors explained, "[t]he purpose of the Cyborg, as well as his own homeostatic systems, is to provide an organizational system in which such robot-like problems are taken care of automatically and unconsciously, leaving man free to explore, to create, to think, and to feel" (Ibid.).

In the late 20th century, this idea entered science fiction, where the cyborg was depicted as a half-man/half-machine entity, with robotic or bionic parts and abilities which exceed the natural human capacities. Sociologist Donna Haraway was the one to extend the concept of the cyborg beyond the science fiction genre and place it inside the context of social theory. In her famous essay "A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century", Haraway used the cyborg figuration as a metaphor for the analysis of postmodern human identity. The author attempted to transcend the binary oppositions

which dominate Western thought, in an era where "traditional boundaries are leaking" (Wardrip- Fruin, 2003: 515). Haraway argued that technology can improve the human condition by making us reconsider such categories as human/animal, nature/technology, organism/machine, woman/man: social constructs which have perpetuated Western hierarchies. In the late twentieth century, she writes, "we are all chimeras, theorized and fabricated hybrids of machine and organism; in short, we are cyborgs" (Haraway, 1991: 150). By thinking of ourselves as cyborgs, we can liberate ourselves from a way of understanding the world which has been the cause of social oppression.

The "Cyborg Manifesto" became a landmark in academic debates about the relationship between human and technology, while the concept of a half-man/half-machine entity remained prominent in science fiction. A dominant theme was the prediction of the coming of a posthuman future. In *How we became posthuman*, literature professor Katherine Hayles examined a number of postmodern literary texts in order to detect similarities and discontinuities between the "natural" self and the posthuman (Hayles, 1999). She detected certain recurring ideas: first of all, posthumanism indicates a separation of information and materiality and considers that the embodiment of information is not exclusive to the human (Hayles, 1999: 2). An example is the description of the body as "data made flesh" in *Neuromancer* (Gibson, 1984: n.p.) or the idea of the human consciousness extracted from the body in *Mind Children* (Moravec, 1988), which is analysed in the next chapter. Posthumanism privileges consciousness over materiality and not consider the coexistence of both as indispensable for the survival of the whole. The human body is only the "original prosthesis we all learn to manipulate" and therefore any modification is considered as an extension of this process. Finally, in posthumanist thinking, there is no absolute distinction between the human and the intelligent machine (Hayles, 1999: 2-3).

In other words, the science fiction posthumanism is a new perspective which suggests that the homo sapiens is still in an evolutionary process and that its union with intelligent technology is leading the way for its development into a superior species. However, apart from the utopian/dystopian narratives which accompanied this idea in popular culture, the metaphor of the posthuman is of great importance for the examination of our changing perception on what it means to be human in a technological world. The cyborg is the embodiment of a fear that the human is heading towards the end of its sovereignty. "The redefinition of the subject under the conditions of electronic culture is a response to the fear that the human has become obsolete, last year's model", Scott Bukatman explains (Bukatman, 1993: 208). Therefore, the posthuman figuration does not refer to a mere technological shift, but most importantly suggests an ontological shift in postmodern society. In other words, the

posthumanist thinking is not to be solely examined as a prediction for the future of humanity, but most significantly as a new perception of the human self:

> "[w]hether or not interventions have been made on the body, new models of subjectivity emerging from such fields as cognitive science and artificial life imply that even a biologically unaltered Homo sapiens counts as posthuman. The defining characteristics involve the construction of subjectivity, not the presence of nonbiological components" (Hayles, 1999: 4).

In this sense, the figuration of the cyborg is not only a symbol of technological progress, but also a discursive formation (Hayles, 1995: 322). It does not suggest that we are no longer human, but that the connotations surrounding what we define as human are no longer sufficient. By bringing together the natural and the technological, it calls for a re-evaluation of the traditional understanding of human (Ibid.). This perspective explains why Donna Haraway envisioned the cyborg as an opportunity for the deconstruction of traditional humanist dichotomies (Haraway, 1991). The "Cyborg Manifesto" triggered the development of posthumanist criticism in the 1990s, affecting the works of cultural theorists, such as Katherine Hayles and Scott Bukatman.

As I have said in the introduction, Katherine Hayles has called for the construction of new versions of the posthuman, which reveal the new ways in which subjectivity is being shaped in the postmodern society. It is my intention to show that such narratives have appeared in contemporary science fiction, suggesting that the human self and the world is depicted today in popular culture through the framework that posthumanist critics had suggested in the 1990s. Therefore, in the following chapter, I will compare dominant themes of the merging of human and digital technology in science fiction of the late 20th century to corresponding narratives of the last decade.

3. The posthuman in science fiction

As it was mentioned in the introduction, my research looks at how the relationship between the human body and the virtual space is depicted in science fiction novels and films, as well as the emotional reactions which appear to accompany the physical entrance of the characters into the digital realm. I do so by way of a textual analysis, proceeding in two steps: in the first part, I attempt to detect these themes in science fiction works of the late 20th century and in the second part I look at how corresponding themes are being depicted in science fiction texts produced since the beginning of the last decade. My aim is to reveal the dichotomies which dominated our perception of the human-technology relationship in earlier science fiction stories. These dichotomies seem to be gradually fading away in the more contemporary depictions of the posthuman. The findings of this analysis are further discussed in the next chapter.

3.1. Forecasting the end of human: the science fiction cyborg in the late 20th century

The 1980s and 1990s saw the explosive growth of digital technology, with the entrance of personal computers in the homes, the commercialization of the internet, as well as the progress of research in robotics and artificial intelligence. Those rapid changes sparked the technological imaginary, triggering predictions about the rise of a technological heaven inside a virtual world, which would substitute the real one, providing us with experiences that would not have been possible otherwise. At the same time, discussions about the future implications of computer technology featured feelings of techno-anxiety, revealing a concern that this new machine would inevitably make us lose our identity, our emotions, our very humanity.

The idea of an unknown realm that was going to substitute the world that we live in entered popular discourse and was reflected in science fiction novels and films. This realm was depicted as an abstract place inside a computer network and found a name in "cyberspace", a term whose popularization is attributed to William Gibson. In his 1984 novel *Neuromancer,* the science fiction writer described cyberspace as:

"[a] consensual hallucination experienced daily by billions of legitimate operators, in every nation, by children being taught mathematical concepts... A graphic

representation of data abstracted from the banks of every computer in the human system. Unthinkable complexity. Lines of light ranged in the nonspace of the mind, clusters and constellations of data. Like city lights, receding..." (Gibson, 1984: n.p.)

The term soon extracted science fiction and was adopted by academics and computer professionals, in order to describe the new phenomena which had arisen by the rapid developments in computer technology (Benedikt, 2000: 29-30). Although the wide use of the term was later criticised by Gibson himself as a "meaningless" buzzword[5], it nonetheless exercised a strong effect on technocultural discourse, to the point as to become almost synonym with the internet.

Apart from its contribution to the popularisation of "cyberspace", *Neuromancer* signalled the birth of the cyberpunk genre in postmodern science fiction. Usually set in dystopian futuristic landscapes, cyberpunk stories are dominated by themes such as "urbanism, the underworld and social marginality" (Bukatman, 1993: 141). The cyberspace is visualised as a mysterious, wired world, where people are being subjected to surveillance, mind control and manipulation by intelligent machines (Dinello, 2005:14). In *Neuromancer*, the story is set in a near future of "cyberspace cowboys", genetic "surgical boutiques" (Gibson, 1984: n.p.), body implanted weapons, technologically enhanced clothing and corrupt corporations. People can modify their bodies with implants which allow them to travel in and out of the cyberspace, providing them with a "techno-paradisiacal escape from the banality of everyday reality" (Dinello, 2005: 147). Case, the protagonist, is denied that privilege by having his nervous system damaged, when caught stealing. He then sinks into self-destruction, longing for the "bodiless exultation" that the cyberspace used to give him (Gibson, 1984: n.p.). He falls "into the prison of his own flesh" (Gibson, 1984: n.p.), suggesting an addiction to cyberspace, to an extend that he rejects his natural body (Dinello, 2005: 160).

This is a recurring theme in William Gibson's novels and in cyberpunk in general. As film studies professor Daniel Dinello writes: "[w]ith the body as the interface and the brain as a computer, the human becomes a machine trapped in an inescapable cage." (Dinello, 2005: 14). Addicted to the enhanced capacities, to the thrills and freedom that the connection to the cyberspace entails -"tears of release" are falling from Case's eyes when his nervous system is being repaired later on in the story-, the subject rejects the real world and despises the limited natural powers of the human body, which is ironically referred to as "meat" (Gibson, 1984: n.p.). As film and media studies scholar Scott Bukatman notes: "[t]he physical reality of the

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5 William Gibson characterized the term "cyberspace" as "evocative and meaningless" in the 2000 documentary *No Maps for these Territories* (See: http://www.wired.com/science/discoveries/news/2009/03/dayintech_0317)

body is no longer a requisite for the existence of the subject" (Bukatman, 1993: 253-254).

Another common theme in cyberpunk is the threat of intelligent machines which intend to conquer the world. Wintermute, an artificial intelligence in *Neuromancer*, gains absolute control over the novel's heroes and strives to evolve into an all-powerful entity and dominate humanity. This concept is stronger in *Terminator*, a science fiction film released on the same year that *Neuromancer* was published (*Terminator,* 1984). The story is set in a dystopian future, where Skynet, an artificial intelligence, attempts to destroy the human kind by creating killer anthropomorphic cyborgs. A group of human rebels are fighting against the machines in order to protect the future of humanity. In an attempt to ensure its catastrophic plan, Skynet sends the Terminator, a cyborg assassin, back in time, to kill the mother of the rebels' leader, so that his birth will be prevented. At the same time, the rebels send a fighter, Kyle Reese, into the past, in order to protect her.

Rich in such antitheses, such as Skynet versus human rebels and Terminator versus Kyle Reese, the film visualizes an antagonistic relationship between the human and the nonhuman (Pyle, 2000: 128). Here, the cyborg figuration embodies an anxiety about the loss of our humanity because of our increasing dependence on technology (Dinello, 2005: 129). The theme of a war between humans and cyborgs, common in cyberpunk science fiction[6], shows our fear about the possible effects of technology, a fear that future humans will no longer be what they are now. At the same time, it reveals a hidden fantasy to master the machine, a "collective desire to crush the technological other" (Pyle, 2000: 129).

As the advancements in information technology and genetic engineering progressed, a new wave of utopian predictions about the future of humanity appeared. The new possibilities which emerged encouraged the idea of an upcoming shift in the human condition and gave rise to the movement of transhumanism. The basic principle of this movement is that "by responsible use of science, technology, and other rational means we shall eventually manage to become posthuman, beings with vastly greater capacities than present human beings have" (Bostrom, 2005: 4). Technological developments created new opportunities for transcending the restrictions of nature; they intensified the expectations that we will soon have more control over our health, our mood, our memory, our lives in general. In other words, the advocates of transhumanism believe that the next step in human evolution is up to us: in order to improve human condition, we need to reconsider the human.

The idea that we are heading towards a new era for humanity was expressed in a variety of popular science books written by futurists such as Hans Moravec and Ray Kurzweil. These

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6 For example, see *RoboCop* by Paul Verhoeven (1987) and *The Matrix* by the Wachowski Brothers (1999).

texts contributed to the popular understanding of emerging technological fields, such as robotics and artificial intelligence, but they also provided a new stimulus for the technological imaginary. "Suddenly the interested reader could access 'non-fiction' books about 'real science', and no longer need submit to the fantastic imagination of science fiction", says religious studies professor Robert M. Geraci (Geraci, 2011: 151). Robotics scientist Hans Moravec has been one of the most significant influencers of transhumanism, advocating for the idea that it will soon be possible for machines to acquire human levels of intelligence. In *Mind Children: The Future of Robot and Human Intelligence,* written in 1988, he notes:

"We are very near to the time when virtually no essential human function, physical or mental, will lack an artificial counterpart. The embodiment of this convergence of cultural developments will be the intelligent robot, a machine that can think and act as a human, however inhuman it may be in physical or mental detail. Such machines could carry on our cultural evolution, including their own construction and increasingly rapid self-improvement, without us, and without the genes that built us. When that happens, our DNA will find itself out of a new job, having lost the evolutionary race to a new kind of competition" (Moravec, 1988: 2).

Emphasising that humans should have a proactive role on their own evolution, transhumanist thinkers supported that, when machine intelligence will surpass ours, this will mean the rise of a new era for humanity. This concept became known as the technological singularity and was supported by Hans Moravec and other influential futurists, such as Ray Kurzweil. In *The Age of Intelligent Machines,* the author claims that the changes that have taken place in the way the human brain operates since the beginning of humanity suggest that in the near future we might be able to create something more intelligent than humans (Kurzweil, 1990: 20-21). According to computer scientist Vernor Vinge, when we reach that point, technological progress will be accelerating with paces that we cannot even conceive, since it will be driven by greater-than-human-intelligent agents (Vinge, 1993, n.p.). This development will have a transforming impact on the human condition: "[w]e will be in the Post-Human era. And for all my rampant technological optimism, sometimes I think I'd be more comfortable if I were regarding these transcendental events from one thousand years remove ... instead of twenty" (Ibid.).

Another common belief in technocultural discourse back then was that, acquiring the capacity to simulate human intelligence and attribute it to a machine could help us better understand the human mind itself. For transhumanist thinkers, the technological singularity

also means that we will eventually be able to upload the human consciousness "into a suitably powerful computational substrate" (Kurzweil, 2005: 199). Therefore, one dominant idea of the transhumanist movement was the hypothetical technology of whole brain emulation, more commonly referred to as "mind uploading". According to Anders Sandberg and Nick Bostrom, whole brain emulation would be the process of scanning the structure of the brain in detail and constructing a software model of it "that is so faithful to the original that, when run on appropriate hardware, it will behave in essentially the same way as the original brain" (Sandberg, 2008: 7). If the information contained in the brain could be extracted from it and stored in digital form, it would not be subjected any more to the limitations of the human body. This idea encouraged predictions which went as far as to predict the achievement of digital immortality in a virtual world. Cybernetics professor Kevin Warwick advocated for a future where humans would be replaced by cyborgs, surpassing the restrictions of human understanding and communication by connecting their minds inside a "global computer network": "[t]hey can tap on it, call on its intellectual power, its memory, merely by thinking to it. In return, the global network calls on its cyborg nodes for information or to carry out a task" (Warwick, 2004: 298).

At the same time, the science fiction genre was developing, conjuring up stories set in the post-singularity futures of intelligent robots and mind-uploading technologies that futurist scientists envisioned. "As transhumanist beliefs and practices become more explicit in science fiction, the public will rapidly become more familiar with them and perhaps even adopt transhumanist religiosity in their own lives", Geraci notes (Geraci, 2011: 156). Simultaneously, post-apocalyptic science fiction authors were scientifically trained and experienced inside the technology industry, in contrast, for example, to William Gibson, who did not have any computer education when he wrote *Neuromancer* (Raulerson, 2010: 17-18). Therefore, science fiction acquired a two-fold relationship with actual technological progress, using it as an inspiration for its futuristic stories on the one hand, but, on the other hand, affecting the technocultural discourse of that time.

As with the use of the term "cyberspace" in the cyberpunk genre, certain terms which were associated with the transhumanism movement also have their roots in science fiction. Vernor Vinge, who analysed the concept of the technological singularity in the aforementioned essay, had previously used the idea of a post-singularity future in his 1986 novel *Marooned in Realtime.* In the story, a device has been invented which allows people to travel to the future. The heroes are a group of people born in different times in history, who end up together in the 23rd century. They soon realise that the human civilization has disappeared from the Earth and they try to discover what has happened. Following a variety

of assumptions, including alien invasion and ecological disaster, it is revealed that the human race is not actually extinct, but it has possibly transcended to a different form of existence due to some super-human intelligent technology. The mystery is never solved completely, for the reason that it is impossible for the human mind to perceive whatever it is that has happened to humanity: "It was a Singularity, a place where extrapolation breaks down and new models must be applied. And those new models are beyond our intelligence" (Vinge, 1986: 110-111).

So far, I have focused my interest on science fiction narratives of the late 20th century. By looking at depictions on the merging of human body and virtual space, I have discerned two dominant themes in the works which have been analysed. The first one is the idea of the rise of a virtual heaven, were the limitations of the fictional "real world" are being abolished. This becomes apparent in the longing for the entrance to the "consensual hallucination" of the cyberspace in *Neuromancer,* as well as in transhumanist visions for the upgrade of the human species through the storage of consciousness inside a digital network. The second theme is the idea of the advent of a new era in the evolution of human through its union with artificial intelligence. This can be detected, for example, in the depiction of warrior cyborgs in *Terminator* or in the post-apocalyptic science fiction concept of the replacement of humans by something more powerful after the technological singularity. In both cases, the posthuman and the future world are imagined as something foreign to the human self and the world as we know it. It could be suggested that in the narratives examined above lurks the fear that, the more we find it difficult to think of the human without the machine, the more the body is threatened to become obsolete.

3.2. Integrating the digital into the offline world: narratives of the posthuman in the 2010s

In the previous chapter, I have explained how the technological advancements of the 21st century have formed a new fusion of atoms and bits. The increasing ubiquity of computer technology and the wide use of social networking websites have rendered the boundaries between the physical and the digital difficult to discern. I now attempt to show how this technological shift has influenced the imaginary of the fusion of human and digital technology in contemporary science fiction. It is without a doubt that the science fiction production of the 1980s and 1990s exercised a strong effect to the way that the genre has developed today. The authors of science fiction of this century grew up reading the cyberpunk and post-apocalyptic novels of William Gibson and Vernor Vinge. Simultaneously, they have the capacity to

experience what once was an imagined future: they live in an era where the internet is pervasive in almost every aspect of everyday life and, in this sense, they can approach the meaning of concepts such as the "cyberspace" and the "singularity" in a more critical way. As Lawrence Person, editor of science fiction magazine Nova Express, explains: "[t]he postcyberpunk viewpoint is not outside the fishbowl looking in, but inside the fishbowl looking around" (Person, 1998).

Cory Doctorow and Charles Stross are two significant representatives of this generation of authors. They have contributed to the science fiction production of the 21st century with works such as *Down and Out in the Magic Kingdom* (Doctorow, 2003) and *Accelerando* (Stross, 2006). Their experience inside the computer industry is indicative of the increasingly interrelated dynamics between actual technological progress and science fiction. Contemporary authors seem to be more affiliated with new media, whether from a professional or an academic background. Doctorow himself is an open source software activist and a first-generation technology blogger, while Stross is a former programmer with a degree in Computer Science. The *Rapture of the Nerds: A Tale of the Singularity, Posthumanity, and Awkward Social Situations*, written in 2012, is a collaboration between the two authors (Doctorow, 2012).

The story takes place in a near post-singularity future, in the end of the 21st century. The Earth's population is only one billion people, more precisely "hominids", as the authors call them, since most of them are genetically and technologically modified, so that they can alter their gender, appearance and identity at any time. The rest of the humanity chose to leave their physical bodies and ascend to the "Cloud", a fog consisting of uploaded human consciousnesses and computer fragments, which surrounds the Earth. Huw, the protagonist, is a resistor of high technology, even though his parents have ascended to the Cloud decades ago. He enthusiastically accepts an invitation to serve his jury duties as a member of a committee which determines the fate of technologies sent to the Earth by the Cloud. Nevertheless, he soon finds out that by accepting this invitation he becomes involved in a conspiracy, which is not fully revealed until the third and final part of the novel. After a series of adventures, Huw is finally forced to enter the Cloud, after having unexpectedly been rendered as a female. There, she is reunited with her parents and learns that the fate of the Earth is up to her. The galactic federation threatens to destroy the Earth because of her father, who succeeded in his attempt to sneak into another galaxy by transmitting "several billion copies of himself by phased array antennas" (Doctorow, 2012: n.p.). As a result, the galactic federation now considers the human species as a threat for the Universe and they will proceed to destroy the Earth, unless Huw agrees to collaborate with the Cloud in order to find a

solution.

At first glance, it seems as if the novel repeats the themes which dominated science fiction of the late 20th century. The reference to Huw's rejection of high technology, already in the first pages of the novel, can give the impression that what follows is another fearful depiction of the future implications of technology in our lives. However, the profuse sarcasm and the various popular science references employed by the authors- for example, Nikolai Federov[7], one of the precursors of transhumanism, is at one point referred to as the Prophet of resurrection in the "Christian States of America"-, suggest that their actual purpose is to criticise these older narratives on the future of humanity. The title itself is reference to the technological singularity, which has ironically been called "the rapture of the nerds" by its dissenters. I, therefore, argue that the novel can in fact be read as a commentary on the way we use technology today and that the Cloud can be considered as a metaphor for the tremendous amounts of online data which we upload online every day.

As it was shown above, in earlier science fiction texts the posthuman is described as a superior entity which surpasses the weakness of the human body through its union with digital technology. However, in *Rapture of the Nerds* those who have ascended to the Cloud retain the flaws of human nature. This can be seen, for example, in the feeling of nostalgia which causes them to constantly interfere with the earthly issues through "pranks, poison, or care packages" (Ibid.). The deviation from the traditional themes of science fiction becomes even more clear when female Huw finally enters the Cloud and is surprised to find its inhabitants dominated by the same conflicts which reign human nature in the real world: "the cloud consists of a myriad of shards separated by light-speed communication links, the homes of hordes of bickering beings who cling to their own individuality as tightly as any mud-grubbing neophobe" (Ibid.). I suggest that this description can be read as a commentary on our online behaviours: in the age of ubiquitous technology and social media we no longer access the internet as anonymous avatars. As it was mentioned above, our online activities are increasingly interconnected to our real world social interactions. In this sense, the fictional world of the Earth and the world of the Cloud in *Rapture of the Nerds* can correspondingly be seen as metaphors for the offline and the online world of the 21st century. The latter is not completely separated from the real world, but is rather a reflection of everything which constitutes it, including its human flaws.

In the end, Huw realizes that "[h]er primary beef against the singularity has never been existential—it's aesthetic" (Ibid.). It is not humanity that is at stake. The actual target of the

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7 Stross has previously initiated a discussion on Nikolai Federov's concept of the "Rapture" in his personal blog: http://www.antipope.org/charlie/blog-static/2011/07/federovs-rapture.html

authors is the way we choose to exploit all the possibilities offered to us by technology:

> "The power to be a being of pure thought, the unlimited, unconstrained world of imagination, and we build a world of animated gifs, stupid sight gags, lame van-art avatars, brain-dead "playful" environments, and brain-dead flame wars augmented by animated emoticons that allowed participants to express their hackneyed ad hominems, concern-trollery, and Godwin's law violations through the media of cartoon animals and oversized animated genitals" (Ibid.).

In order to save humanity, Huw has to stop envisioning technology as a menace. She has to defend those who chose to stay on Earth and, in order to do so, she has to come up with a better argument than the idea that the entities who inhabit the Cloud are not "good enough simulations of the real things" or that anything which is "determined by some algorithm" is not real (Ibid.). Otherwise, by presenting them as two conflicting worlds, she also perpetuates the idea of the physical world as weak and the digital domain as an improved virtual version of it. She therefore has to realise that what belongs to the online world is not separated from the offline, but that they are both linked inside the frames of what constitutes reality. This idea is more clearly summarised in the words of Huw's father: "after all, the cloud is the apex expression of humanity's extended phenotype" (Ibid.).

The same critique on our behaviour towards technology today can be observed in *Black Mirror*, a british science fiction television series, written by Charlie Brooker (*Black Mirror*, 2011). The series consists of several unconnected episodes, each of them taking place in a different futuristic world, surrounded by a different technological background. In the third episode, titled *The Entire History of You,* the story is set in a future where the "grain", a chip which can be implanted inside the brain, has offered people the capacity to record everything they see or hear and replay scenes from their everyday life at any moment. This technology becomes the cause of conflict for Liam, the protagonist, when he suspects that his wife is cheating on him. In his quest for clues which will confirm his suspicion, he uses the gain to replay his recent memories, something which leads to obsession, to the point that he demands that his wife replays her memories with him present. Eventually, his personal life is being destroyed and, in a gesture of despair, Liam rips the implant out of his skin.

In contrast to earlier science fiction, where the insertion of digital technology into the body inspired fearful narratives about the end of humanity, here the centre of attention seems to be our very human nature, brought to the surface by the way we choose to use technology. More specifically, I argue that our interpretation of the story should not focus on the possible

perils of chip implantation, but on how the use that the protagonists make of it is affecting their lives. Although it plays a major role in the plot, it seems that the mere existence of the chip does not influence the direction in which the romantic drama is being unravelled. Both of the protagonists still envision the situation through their own subjective truth, even though the implant offers them access to the one and only truth of facts. They may be technologically enhanced, but they still act like flawed humans and not like powerful superhuman entities. I therefore suggest once again that, in a deeper level, the story can be seen as a commentary on the way we use digital technology today. We record our everyday life activities through wearable cameras and self-tracking applications and we share our personal data and memories in our social media accounts, leaving them out in the open for everyone to see.

This issue seems to also be at the centre of *Be Right Back,* the first episode of the second season of the series. In this story, a hypothetical online service promises to help people who have lost a loved one to cope with their grief by creating a virtual persona of the person who has passed away, based on their previous social media activity. The user can interact with this persona through e-mail, talk on the telephone and, eventually, create their artificial duplicate. In order to do so, they have to give permission to the service to access videos and pictures which the deceased had uploaded in their social media accounts, so that the voice and appearance of their virtual persona can become as realistically recreated as possible. Martha, the protagonist, has lost her boyfriend in a car accident and, unable to accept his loss, she decides to temporarily make use of this service. However, she soon loses control, starts questioning what is real and what is not and eventually becomes unable to give the service up. As far fetched as the thought of a future where we will be able to create an artificial human might seem, what is more thought provoking is the accuracy with which the service supposedly succeeds to "bring back the dead" based on data extracted from social media. In this sense, the story can also be perceived as a commentary on our online behaviour today. The amount of data that we constantly upload is so high that one could metaphorically "recreate" ourselves online.

Now that I have analysed my source material, I proceed to a more in-depth discussion of the findings of the above textual analysis. My aim is to detect discontinuities in narratives on the posthuman between the two chronological periods examined above, in order to find what is new in the way science fiction imagines the merging of human and technology today. Moreover, I attempt to connect the insights revealed by this comparison to the aforementioned theories of posthumanist criticism. I thus intend to show that the science fiction cyborg is not seen any more as a literal image of the future human. Instead, it is being increasingly recognised as a metaphor for the description of the new human identity which is being formed

in the age of computer technology. In this way, it can be seen as contributing to the formation of the new perspective that Donna Haraway and other cultural critics were calling for in the 1990s.

4. The new technological imaginary

So far, I have attempted to detect recurring themes in the depiction of the fictional crossing of the boundaries between the physical world and the digital domain, as well as the emotions which this encompasses: first, in science fiction novels and films of the late 20th century and, afterwards, in corresponding texts produced in the present decade. By comparatively analysing such themes between the two chronological periods, one can detect several discontinuities. For example, the feeling of threat against the cyberspace in *Neuromancer,* is attributed to the addiction it can cause due to the superhuman powers it promises to give, while in *Rapture of the Nerds,* the suspicion in which Huw regards the Cloud appears to have been caused by his repulsion towards the behaviours of those who comprise it. In a similar manner, the union of human and machine in *Terminator* is presented as the creation of a powerful entity which threatens to destroy and replace humanity, while in *The entire history of you,* the cyborg looks nothing like the genetically engineered being of earlier science fiction stories: although still merged with digital technology, the cause of perils in the protagonists' lives is not the chip implant itself, but rather the way they choose to exploit it.

Such discontinuities in the indicative texts which have been examined in the previous chapter, can suggest a larger shift in the imaginary of the relation of human and technology in science fiction. In the 1980s and 1990s, the entrance of the subject in a digital domain was imagined as an entrance to another world, which looks nothing like the one we inhabit. Today, the fictional future is pictured as more familiar to the real world of the 21st century. Even in the more far-fetched scenario of the ascendance of people to the Cloud in *Rapture of the Nerds,* the many parallelisms shown in its analysis suggest that the future world in which the story unravels can be read as a metaphor for our contemporary online habits. Moreover, in narratives of the earlier chronological period under examination, descriptions of the fictional future feature utopian or dystopian predictions about the transformation of humans and their world, through their union with technology. In contrast, in more contemporary science fiction stories, the digital world is enmeshed with the real one and, together, they coexist right in front of the protagonists, who unconsciously navigate between the two during their every day life activities. It is worth mentioning that cultural editor Adam Rothstein notices this unconscious use of digital technology in a meta-level in *Black Mirror*: It is apparent not only through the story plot, but also in the depiction of technologies which are probably already around the viewer at the exact moment that they watch the series. The technological

background which surrounds the stories is a reconstructed version of the actual background of the contemporary Western world in a way which reflects the anxieties we already have about the possible outcomes of our online behaviours. Therefore, there is also a second level through which technology is critically examined in the cultural-social context in which it is being used. It can be found in the "creation of a ludic, liminal space, in which our minds can play out its dreams while we simultaneously continue to thumb our touchscreens" (Rothstein, 2013).

Science fiction has always reflected our fears and expectations towards technology, our predictions about the future of humanity, our perceptions over what is possible and what is not. When embedding the science fiction narratives from the two aforementioned chronological periods in a comparative analysis, it becomes apparent that a significant change has taken place in our technological imaginary in the 21st century. The hopes and fears do not stem from the possibilities of the technology itself, but rather from the way we choose to exploit these possibilities. While in the cyberpunk and post-apocalyptic fiction of the 1980s and 1990s the expectations for improvement or the fear for dehumanization were attributed to the technology itself, more contemporary science fiction narratives imagine the future as an outcome of our own behaviours towards technology. In this sense, it seems that today popular imagination no longer approaches technology as something separated from human life, but instead as an integral part of it.

As it was shown in chapter 2, the technological advancements of the 21st century have caused a new fusion of atoms and bits. While technology is becoming increasingly pervasive and our online behaviour seems to be rendered as an extension of our real lives, the boundaries between the digital and the physical, between human and machine, become less distinct. Contemporary science fiction reflects this interplay between the two worlds, which looks nothing like the depiction of the cyberspace in *Neuromancer* (Gibson, 1984) or the process of mind uploading in the predictions of transhumanists in the 1990s. And by acknowledging the increasingly blurring boundaries between online and offline world, it seems to be making a commentary on how we coexist with technology today.

In this sense, it could be argued that the new narratives on the posthuman that Katherine Hayles called for in *How We Became Posthuman* (Hayles, 1999: 291) are already being formed. The science fiction of the 21st century does not envision the fictional cyborg as the next step in the evolution of the human species, but rather looks at the concept as an opportunity to critically approach the relationship between human and technology today. It proposes a new narrative model of the cyborg, one which no longer resembles the imagined human-machine entities of late 20th century science fiction. This new figuration seems to be

closer to the cyborg of Donna Haraway: it is a metaphor for the new way we perceive the human self and the technological world around it in the Western society of the 21st century. It suggests that we are already cyborgs, even when we do not technologically enhance our bodies with wireless devices and chip implants. We are already cyborgs in a world where the online and the offline, the digital and the physical coexist, in order to form a new, augmented reality.

In other words, the new visual and verbal vocabulary of science fiction seems today to be reflecting the ontological shift that posthumanist critics had predicted in the end of the previous century. It seems to lead the way for the deconstruction of the dualistic thinking which has accompanied the technological imaginary since the very first traces of human-machine relationship. This thinking was keeping us subjected to oppressive binaries, preventing us from embracing the liberating possibilities of technology. Traditional science fiction narratives predicted "a kind of technologically incubated mind-rot, leading to loss of identity, loss of control, overload, dependence, invasion of privacy, isolation, and the ultimate rejection of the body", writes professor of philosophy Andy Clark (Clark, 2004: 198). In contrast, today we seem to embrace our hybrid nature of "machine and organism" that Donna Haraway, Katherine Hayles and others had predicted. According to Clark, we are "natural-born cyborgs", because we have always used technology, we have adapted our lives in order to make use of it and our being and our thinking is inseparable from technology. Now that we seem to be heading towards the acknowledgement of this relationship, we can make the most out of the rapid technological evolution of our time. "By seeing ourselves as we truly are, we increase the chances that our future biotechnological unions will be good ones"(Ibid.).

The new vocabulary which is being established in science fiction of the 21st century is certainly not limited to the genre, but can also be detected in other fields of popular and technocultural discourse. The increasing use of the term "augmented reality" suggests an awareness of the symbiosis of real and artificial world, in contrast to the earlier use of "virtual reality", which implied the creation of an artificial world, rather than the enhancement of the existing one. The practise of self-tracking has introduced the movement of the "quantified self", a concept which reveals the translation of ourselves into data[8]. This new vocabulary suggests the formation of a new subjectivity: a new way to make sense of our human self, a new awareness of the world around us, which rejects the dichotomies which have dominated Western thought.

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8   The term is attributed to the editor of Wired magazine, Gary Wolf, who sums it up as "self knowledge through data": http://www.wired.com/medtech/health/magazine/17-07/lbnp_knowthyself

5. Conclusion

Beyond Dualistic Thinking

The increasing pervasiveness of computer technology has lead into a new involvement of machines into our everyday lives. Whether through its insertion into our bodies and our surrounding environment or through the unprecedented interplay that social media have formed between our online and offline interactions, digital technology in the 21st century has created a new fusion of atoms and bits. The boundaries between the digital and the physical, the online and the offline, are becoming less and less easy to discern. This technological shift has given rise to a significant debate in new media studies, with scholars emphasising on the necessity for the construction of a new framework in the study of the human-technology relationship. This framework should acknowledge the increasingly blurring boundaries between the online and the offline and should criticise their perception through a dualistic thinking which recognises them as two separate spheres.

This thesis has sought to contribute to this discussion by focusing on the way the fusion of the two worlds is depicted in cultural production, more precisely in science fiction narratives of the merging of human and technology. In order to look at how science fiction texts can provide insights about the new understanding of human-machine relation, I separated my research process into two steps, translated into two research questions: how is the merging of human and technology envisioned in contemporary science fiction, in contrast to the early years of computer technology, and, what can this shift in our technological imaginary indicate about the new way we perceive the human in a technological world?

I begun my investigation by placing the aforementioned debate inside the frames of an older discussion, which was founded in the 1990s based on the famous essay of Donna Haraway, "A Cyborg Manifesto". An analysis of posthumanist criticism of the late 20th century proved to be a useful starting point for the understanding of the dualistic thinking which dominates our thought, resulting in social oppression. According to Donna Haraway, Katherine Hayles and other cultural theorists, only by recognising our hybrid nature as cyborgs will we be able to stop envisioning technology as something foreign to our nature and to exploit the full liberating potential of technological progress.

In chapter 3, I have shifted my attention to popular culture and attempted to examine how the cyborg has been depicted in science fiction narratives about the merging of human with

digital technology. I have done so by conducting a critical discourse analysis on the posthuman figuration, first focusing on science fiction novels and films of the 1980s and 1990s and, then, on corresponding texts produced since the beginning of the present decade. I approached my source material by looking at the language used in the description of the entrance of human body to the digital space and the feelings this entrance features. I found that in the earlier texts, the virtual realm is presented as something separated from the real world and the characters approach it with a longing for the unlimited possibilities it encompasses or with fear for the loss of humanity it might lead to. In more recent texts, it appeared that the digital domain is already around the characters, enmeshed with reality and incorporated into their social activities.

These findings where embedded into a comparative analysis in the last chapter, in order to signify what is new in our technological imaginary today. This analysis provided an answer to my first research question: it was found that our expectations towards technology today are nolonger perceived through dystopian or utopian predictions about the rise of a new era for the human species, but rather acknowledge the importance of our own use towards it. It therefore seems that technology is increasingly perceived in science fiction through a more critical lens, embedded into the social and cultural context in which it is being employed. In this sense, the new narratives of the posthuman that posthumanist critics had predicted two decades ago are already being constructed. This realisation was further elaborated in order to provide an answer to the second research question: the science fiction imaginary of the 21st century suggests that we now recognise the blending of human and machine, of physical and digital. Therefore, this shift in popular culture suggests a larger ontological shift, since we are now aware of the hybrid nature of our human selves and of the world around us.

Based on the aforementioned findings, this thesis can add to the discussion calling for the necessity of a new framework in the critical examination of technology. Of a framework which begins with the awareness that we are already cyborgs in an augmented world and does not perceive digital technology as something separate from reality. None of this is to say, however, that such dichotomies are dangerous for the examination of the human-technology relationship. Dualisms have not vanished from our thinking and it is doubtful that they will ever be completely deconstructed. For example, in *Alone Together*, sociologist Sherry Turkle discusses how our online interactions constitute a threat for real social encounters (Turkle, 2012). The new ways in which we approach our relationship with technology today should not ignore the fact that the properties of the online and the offline are still different. The conceptualization of the digital or the physical alone continue to be useful when criticising technology. However, as I have attempted to show with my analysis, what seems to be new

now is the necessity of this criticism to start from the knowledge that these two spheres are parts of a whole. It is up to further academic research to examine whether this new approach in the relationship between human and machine can be envisioned as a step towards the deconstruction of the whole system of binary oppositions in other fields of the Western understanding of human and the world.

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