Myriam Diocaretz

The Human (,) the Digital: Being in the 21st Century

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Inaugural address by Myriam Diocaretz

Tilburg University

Understanding Society

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Inaugural address
Delivered during the public acceptance of the appointment of
Extraordinary Professor, Socrates Chair in "Humanism and the Digital Society",
at the Tilburg center for Cognition and Communication (TiCC)
of the Faculty of Humanities at Tilburg University, on Friday 18 June 2010

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I

The Socrates Chair

Mr. Rector Magnificus,
Executive Board of Tilburg University,
Committee of Deans,
Dean of the Faculty of the Humanities,
Ladies and gentlemen:

I stand here before you today to officially accept the appointment as Socrates Professor for the Chair in "Humanism and the Digital Society" at the Tilburg center for Cognition and Communication at Tilburg University.

For an understanding of the digital society, I would like to begin with some reflections on a Humanism set in the 21st century, from the perspective of Humanistics (*QANU 2009*). By using the terms "Humanistics" and Humanism, I subscribe generally to the mission to establish an academic multi-disciplinary field with the primary aim of developing visions towards the quality in one's meaningful existence, and a contribution to humane societal reasoning. One of the foundations of this new form of Humanism consists of the affirmation of human experience, with guiding principles and values to understand the worlds in which we exist, and to make them better without utopic thinking, from the notion that the world, as it is, is far from perfect, and that it can therefore be improved for the benefit of humanity.

It is the spirit of Humanistics to support scientific and technical knowledge and its applications aimed at humane objectives. The intersections between Humanism, science and technology are complex, and not new. From a philosophical perspective Western tradition has been dealing with it since the notions of *technē*, and *logos* were introduced by Aristotle, to name just two of the key founding concepts. Within the humanistic vision of the Socrates Foundation, I believe that in our times it is essential to identify the imminent societal challenges and to investigate the role played by technologies in connection with the cultural, ethical, legal, cognitive, economic, and philosophical aspects. Equally important is the need to focus on the human being rather than on the simplified facet of "end-user" or "consumer" of technology in a globalising world where industry and economics tend to predominate. Our increasing reliance on computers and ICT networks in everyday life makes the "human" dimension also indispensable for technical and engineering initiatives. I will illustrate some of

these layers in relation to being human in the digital universe and in the networked world, as well as in an area of future and emerging technologies. I intend to contribute towards a cross-disciplinary mutual nourishment between Humanistics and technology. To this end, I consider it a priority to present a perspective on the *societal applications*. The challenges are many. Nowadays the relationship between Humanism and technology is more problematic because technology is being hailed in the name of innovation, and develops faster than the thoughts about it, as an *a-posteriori*. There is a need to remedy these imbalances. This is where I situate the thematic priorities for the Socrates Chair 'Humanistische Visies op de Electronische Samenleving' — "Humanism in the Digital Society", or in the E-Society.

II

Selected Societal Questions on Scientific Research, Technology and Innovation

Scientific knowledge has evolved much faster than a decade ago, partly driven by the World Wide Web, the Internet and Information and Communication Technologies (ICT). New scientific knowledge and technology go hand in hand nowadays, and this has given rise to "techno-science". With the help of digital technologies, scientists have also unleashed new spaces for research in areas of "uncontrolled scientific progress," as UNESCO (1997; 2003) first declared, an idea that many scientists later adopted, stating, for instance: "The current revolution in science and technology has led to the concern that unbridled scientific progress is not always ethically acceptable." (ten Have 2006: 6). Ethics and the social are being reclaimed, as in this case, to address the present paradigm change. The complexity of these questions can be understood through three examples. The first one is the result of the simultaneous manipulation of flora and fauna. The second one is the first living cell made from synthetic DNA. The third one is the human genome. Furthermore, an outlook on humans in the near future will be exemplified through three developments with great potential to continue further, namely, the mapping of the brain and the search for consciousness, together with micro-chip implants and other prospective beneficial technologies, and Transhumanism.

A Case of Simultaneous Manipulation of Flora and Fauna

The evolving life sciences and techno-sciences have created unprecedented dilemmas in the positive results of experiments dealing with the manipulation of what is "natural" in the physical worlds through genetic engineering.

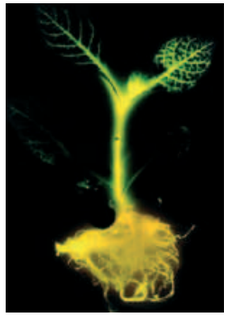

Figure 1. Photo by Keith Wood and M. DeLuca. From David W. Ow, Jeffrey R. de Wet, Donald R. Helinski, Stephen H. Howell, Keith V. Wood, Marlene DeLuca. Transient and Stable Expression of the Firefly Luciferase Gene in Plant Cells and Transgenic Plants, Science, Nov 1, Volume 234, 1986: 858. Reprinted with permission from The American Association for the Advancement of Science-AAAS.

The luminescent tobacco plant shown in Figure 1 above is a good example. It is the result of the "cloned luciferase gene" (Kenefick, 2004). The digital image shows a hybrid living organism that is neither just a plant nor just a firefly, but is both, as a "transgenic multi-cellular organism" (Ow, et al. 1986; Kenefick 2004). Over the years, the manipulation of artificial bio-luminescence from the firefly's glow has made luminescent technologies possible for life science researchers, "with broad applicability to both biochemical and cellular analyses" (Kenefick 2004).

The Creation of the First Living Cell of Artificial Life

In the Artificial Life approach, from von Neumann's self-replicating cells theory in the 1940s, and Turing's organic forms for computational modelling, scientists have established categories within the thinking/non-thinking duality, distinguishing among others, living entities from machines, which, in turn, led to distinctions between things organic and things technological, often translated into the dualism of nature and technology, or the biological and the technological. The recent creation of the first living cell of Artificial Life recently explained as "the synthesis, assembly, cloning, and successful transplantation of the 1.08-Mbp M. mycoides JCVI-syn1.0 genome, to create a new cell controlled by [the] synthetic genome" (Gibson et al. 2010; AAAS 2010), a bacterium's "genetic software" made from synthetic DNA blurs these boundaries (Gill 2010), raising immediate questions, words of caution, and some dismay about the potential consequences.

The new Artificial Life cell is an entity of 'living technology', and as such, a landmark of the scientist as agency of a genesis of life in the lab. For the non-scientist outsider, the current questions go beyond the prospective commercial benefits, since the potential threats of misuses by creating artificial living bacteria and releasing them into the world may be larger than the achievement. Similarly, a different question can be asked: What will the next phase in this line of scientific exploration be now that Artificial Life is scientifically possible? What happens if Artificial Intelligence is induced into the Artificial Life cells?

The Human Genome

The differences between technological and biological entities link genetics with the construction of humanity through the Human Genome Project. Biology and embryogenesis have reached a climax with DNA research and genomics. In terms of its scientific applications, for instance, the potential to correct the family's original biology by designing the genomic coding of a future baby is hopeful for parents who want to eliminate or prevent genetic illnesses, but the social consequences of open choices for any other reasons should not be underestimated (UNESCO 1997; 2003). Parallel to this, one lesson learned from the Human Genome breakthrough is that some of the new challenges to address include finding the ways in which genomics scientific knowledge can be put to the service of humanity, as a unique world public good rather than as codified, patented, and fragmentary knowledge.

The Mapping of the Brain and the Search for Consciousness

After the mapping of the human genome, the new leap forward will be the mapping of the human brain, which is expected to bring a better understanding of cognitive functions and of the cognitive networked systems linked with thinking processes, sensations, and new insights into the existence of consciousness.

The brain-mind-consciousness-body correlation is a rich and yet open field. The old question of the dualism known as the mind-body problem has now evolved to fascinating deliberations in the field of brain-mind-consciousness relations. These connections are indispensable for computer science: What is a machine? Julien de La Mettrie (1748) wrote, against the Cartesian duality, that "man" is a machine, an assumption which was the basis of recurrent viewpoints to the present times. Another frequent question is: can machines have a mind? Next to this a more contemporary inquiry: if a robot can replicate a human, can a

humanoid robot have a consciousness? (Diocaretz & van den Herik 2009). The answer depends on how mind and consciousness are defined. If the answer is yes, it is possible for a humanoid robot to have a consciousness, we need to ask what consciousness is and how can it be built and programmed so that it works, and, especially, to what aims? Another line of questioning can begin with a physicalist or empirical approach that considers the brain as a biological, therefore purely physical organ.

But the question of consciousness continues to intrigue and nourish scientific inquiry, because many approaches, definitions, and answers exist from different disciplines, including the cognitive sciences, philosophy of mind, philosophy of consciousness, and also from the field of Artificial Intelligence (AI). For Strong AI, minds are computer programs built-in to brains and computers, consciousness is a process, and if it is caused by neural processes in the brain, then the puzzle seems to be solved. Likewise, for other scholars "mind" is a biological phenomenon (Searle 1998: 41-43) and thus if consciousness cannot be located anywhere in the body, it probably does not exist (Dennet 1991; cf. Chalmers 1996: 24-25).

A current scientific contest involves the search for consciousness from two distinct lines in inquiry: whether it is a phenomenon or an entity, and whether one can observe it. An experiment conducted by MIT researchers and other academic institutions is directed towards mapping the connectomes of the brain, first of animals, and probably later of humans (Trafton 2010). Another recent research experiment revealed that a patient who was in a vegetative state managed to communicate through brain imaging (Monti et al. 2010; Singer 2010). Linking neural activity with different states of consciousness or mental states and other correlations are a dominant research trend in neurophysiology, amongst other fields, yet investigations of this sort would answer the question of consciousness as a "first-person ontology" (Searle 1998:43) only partially. Human consciousness is, even today, still considered as the unknown, a mystery (Searle 1997) to be unraveled. If, as a mystery or the unknown, it belongs somewhere in the non-physical substance of the human body (Cunningham 2000), then other questions surface by implication, including a metaphysical one, as it links the meaning of consciousness with the notion of "soul" and its immortal nature, and further, with the existence of God.

Micro-chip Implants and Beneficial Technologies

In the wider public sphere, we are entering the age of silicon chip-based sensors implanted in the body or sensor networks in the surrounding physical spaces. Micro-chip implants are being developed for different purposes: tracking, surveillance, e-health, leisure and entertainment, and augmentation.

Many of these offer significant advantages: the neurology brain-chips connecting electromagnetic fields sent to an interface represent a noteworthy advantage for paralysed persons with prosthetic body parts. It allows them to move and function through augmented mobility even if limited. Other experiments with artificial brain prostheses may lead to helping to treat a patient's memory disorders. Other projects seek to enhance the capacity of the normal human brain in order to store memories beyond its known capacity.

In 2002, the Jacobs family from Florida volunteered to test the VeriChip microchips implants and became the first family in the world to live with microchips containing their personal health records. Their motivation was a young member of the family who is disabled. It was a voluntary act and it represents the best of humane technology. A similar injectable microchip implant was designed by the same company as a VIP ID for night club customers to pay for their drinks. It was tested at the Baja Beach Club in Barcelona, and in Rotterdam in 2004, and was reported to have been a success (Applied Digital Solutions 2002).

In addition to micro-chips, other beneficial technologies are being developed and tested, such as the following:

- Virtual humans, virtual audiences, and avatars for the treatment of social phobias
- Humanoid social robots for psychology support
- Brain-machine interfaces for patients to control computers with their thoughts
- Body prosthetics
- Technologies for sensory experience, stimuli, taste, sound and memory, as an enhancement of the body.

Transhumanism

The technologies for body enhancement need to be seen in the light of 21st century scientific developments, including but not limited to advanced robotics,

Artificial Intelligence, virtual realities, the Human Genome, and nanotechnology. The question of enhancement and augmentation of the human body has been widely conceptualised and taken further by a few social movements, among which I select three which stand out: "The Singularity," "transhumanism", and the Human Enhancement Project.

The desire for transcendence dates back many centuries and finds its high points in Western thought, for instance, in the 19th century, including the Anglo-American Transcendentalists. In the 21st century different trends originate, *inter alia*, in a futuristic context, such as the notion of "the Singularity" introduced in 1958, which has grown to a new philosophy, especially through author, entrepreneur, and scientist Raymond Kurzweil's futuristic vision (2005). Kurzweil believes –and many with him– in the enhancement of the body and the mind with technology as a breakthrough in the near future. His idea of the singularity follows the contemporary paradigm of converging technologies, to which I refer in the last section of my lecture, in which he considers four key enablers: genetics, nanotechnology, robotics and Artificial Intelligence.

The second example combines human enhancement through technology with "second-order cybernetics", put forward by the Human Enhancement Project. Natasha Vita-More (2010) provided a succinct summary of this vision for the Humanity Plus conference at Harvard in 2010, which I paraphrase: The idea for the project originates in the 1950-1970s scientific studies inspired by the need for humans to know more about our human ecologies, and about our physiological system considered to be interrelated and part of the "unified whole system" of the universe, including the thinking mechanisms. According to this movement, and to Vita-More, in such interconnectedness, knowing the ways in which humans formulate knowledge, how human behaviour works or functions, and how humans communicate with others, is essential to sustain and protect humans' well-being. Central to these pursuits is the conviction that it is not humans but technology that will facilitate the extension of human life.

The third example I have selected comes out of the belief in surpassing human evolution in order to overcome the biological limits of humanity, developed, for example in the Matrix film trilogy (Diocaretz & Herbrechter 2006b). Such is the movement of computer assisted humans called "transhumanism". It is constituted by "transhumans," defined as "people who have hybridized themselves with computational technology as part of humanity's effort to control its evolutionary destiny." (Terasem Movement 2010). Another description states that "transhumans are persons (entities with human legal rights) who are "*receptive to transcending* biological limitations," [italics mine] (Terasem Movement 2010) who are or want to be partly "noetically synthetic" by making use of intrinsic electronics, such as neural implants for thinking. As in similar perspectives the very definition and understanding of what constitutes a "person" are beginning to be questioned with attempts to claim a "new Law of Transhuman Persons" from the legal, ethical, social and philosophical points of view. Transhuman citizenship does not exist yet, and whether it should be introduced is an open question. The three distinct convictions around transhumanism which I have briefly presented on transforming and augmenting humanity's evolution by means of technology stir up the traditional certainty of what is considered to be human; equally important, they bring to light the potential for ground-breaking principles in our understanding of humanity, and they awaken previously unforeseeable yet imaginable prospects for humankind.

III

The Human (,) the Digital

Being in the 21st Century

Now I shall briefly explain the title of my lecture: *The Human (,) the Digital* are two conceptually different areas. The implied expected conjunction to link them —"and"— is purposely omitted in order to call attention to their non-restricted separation and their difference, set off by the comma between parentheses. Additionally, The Human (,) Digital frame allows me to distance myself from the notions of the *Human Digital* and *the Digital Human* (cf. Negroponte 1995), which correspond to different subjects. In my proposed view to understand the human dimension as a phenomenon of being in the 21st century, my aim is twofold: Firstly, I want to reconfigure the human at a time when humanism has been declared to have come to a closure, and when, as a consequence, we have apparently entered the age of posthumanism and of the posthuman. Secondly, I want to illuminate and complement the views presented by my colleagues Professor Jaap van den Herik and Professor Eric Postma, on their faith in computers, with my faith in the human (van den Herik & Postma 2009).

Restructuring the human into the digital, and assimilating the digital into the human as an interchange of one into the other, is a complex process. It is necessary to recast both notions into the human-digital relation, with care not to stumble into conceptual dualisms (Searle 1998; Vicari 2008). My underlying thesis is that we are *still* human in the digital age, and that there needs to be a roadmap of **responsibility** towards the human subject as current, emerging and future technologies are planned, funded, designed, developed, deployed, marketed, and adopted.

This focus on human-digital relations is not a proposal for a "digital ontology" in which the ultimate nature of reality is digital and the universe is a computational system equivalent to a Turing Machine (Floridi 2009), or for a hypothesis that humans are and have always been machines. Nor is it a return to Haraway's original Cyborg metaphor (Haraway 1985; 1996) or an attempt to transpose the human into the post-human (Hayes 1999), although these two ground-breaking concepts are a juncture from which contemporary leading arguments start out. I wish to point my reflections not towards theory but to the actual digital practices, to the science and technology policy agendas, and to the construction of an area of European citizens' lives in connection with technology.

The World Wide Web and the Internet have facilitated interaction amongst

people, especially through Information and Communication Technologies (ICT). As ICT become more easily available and widely adopted, being in the world attains an added attribute in the ways in which humans live in co-existence with technology, and in co-existence with the mediating processes.

Many people today, especially the digital natives, live with the Internet and mobile communication as if they were "natural", as if they have always been there; and indeed, ICT are as 'natural' to them, as the sun, the moon, and the cosmos are around us, yet with a difference: the technology is closer, and the subject's existence is bound by more specific principles of individuation. For this reason it is important to rethink the question of being, not in the Heideggerian way of the "totality of beings" (Heidegger 1927), but as the question of being human and of being (*still human*) digital in our contemporary world.

The core questions to consider include the ways in which the subject exists in society in relation to the digital; how the individual and the collective function in relation to digital environments; and what social questions emerge in the *technopoiesis* of daily life. To explore these questions we can consider the ontologies of being human in order to draw mappings of relations with the social through the human-digital interactions, as relational and systemic, and to trace the seeming boundaries. The questions can be raised in several ways, from which I select two correlations:

1. Being human in the digital universe
2. Being digital in the networked society.

Being Human in the Digital Universe

The paradigmatic model of "Being human in the digital universe" also invites us to reflect on the non-human factors, keeping in mind that the digital universe is human-made. At one level, the terms suggested by Bruno Latour's Actor-Network-Theory (ANT) are useful (Latour 2005). He showed the ambiguity of the word "social". In his critique of the sociologists who had overlooked the important domain of all that is non-human and quasi-human in their relations with the human, he showed the limits of the term "social" as applied in sociology and the social sciences; therefore, his theoretical model demonstrated why the "social" needed to be redefined. Borrowing from Latour's title *Reassembling the Social* (2005), I propose that we "reassemble" the human in order to prevent the humanity of the subject dissolving in the discourses and figurations of contemporary sociology, science and technology. I shall do this to focus on fundamental questions on society, to propose inclusion of a few important humanistic principles in the re-thinking of "the digital" and "the human". Latour's "sociology of associations" is relevant to show the interaction between the digital and the human practices.

One particular non-human entity is the "Digital Universe" which consists of all the digital information generated, distributed, multiplied, replicated, retrieved, and re-used in our planet. In this respect, there is a constant increase through the Internet as the main tool for the networked worlds. This new entity not only surrounds us metaphorically but is also materially embedded in the private, public, financial, educational, and daily life. Beyond data management facts, each practitioner of ICT contributes to its growth.

According a recent IDC report (Gantz & Reinsel 2010) the Digital Universe grew by 62% to nearly 800,000 petabytes last year. And this year it will grow to 1.2 zettabytes. By 2020, the size of the digital universe will be 44 times larger than in 2009. Here, I should underline the distinction between data, information and knowledge (EC HLEG 1997:15). The IDC report measured the data and information. Digital information is being generated in all kinds of formats, such as E-mails, photos, videos, video streams, images from surveillance cameras, through fixed and wireless devices, by the media, individuals, communities of practice, governments, institutions, and companies. Yet, part of the information flow also results in a growing entropy, the unknown factor which, like knowledge, is difficult to quantify.

In the networked world the human dimension interacts with numerous digital entities: knowledge management databases, search engines, interactive websites, interfaces of virtual agents and helpdesks, data management in business transactions, digital machines in the cities and in closed environments, and in Internet-based services. Therefore the interactions with other humans in society are mediated by devices, systems, and software programmes. The subject —as an individual in society— is increasingly replicated and distributed as data of different kinds circulating in the digital universe in a variety of forms, often unknowingly.

Being Digital in the Networked Society

The Information Society Technologies Advisory Group (ISTAG) announced in 2001: "The vision of Ambient Intelligence assumes a shift in computing from desktop computers to a multiplicity of computing devices in our everyday lives whereby computing moves to the background and intelligent, ambient interfaces to the foreground" (ISTAG 2001). As ambient technologies evolve, *the post-PC mode* of working with ICT takes shape (Diocaretz 2006). Increasingly people function through digital interactive and knowledge contexts, amongst devices and systems which they choose and which are chosen for them, with embedded features and applications designed to manage and assist their work and daily life.

From the 2001 Ambient Intelligence vision, definitions for the 'new' zones of interactions that begin in and with the actual body begin to flourish; such interactions, in my view, can be configured further by individual instantiations and social practices. In technical studies one zone is known as the "Body Area Network" (BAN) originally proposed to refer to interfaces management (Van Dam et al. 2001; Riva et al. 2003). The BAN involves the interaction of the human body with implants as well as gadgets close to the skin, such as the mobile phone, wearable technology (Ditlea 2000), artifacts in small spaces (i.e. the car) or a room with ambient-intelligent areas. In addition to the BAN, a related but different space is called the "Personal Area Networks" (PANs) (Van Dam et al. 2001; Riva et al. 2003). The PAN can work as a flexible concept to include tangible, intangible, human and non-human elements which I extend to the phenomenon of being in digital environments. The human dimension of the surrounding techno-based experience in the Personal Area Networks can be studied as both collective and individual.

The very notion of space, as abundant research shows, has become more intricate because of the seamless connectivity in nomadic computing through mobile networks; next to this physical connectivity is the subject's multiplicity of real and virtual dimensions. Therefore, in order to tackle space and time in human-digital relations, I have added a third level called "new Area Networks" (nAN) which unfolds both from the connections with technological artifacts, and in the subject's dialogic interaction in realities, quasi-realities, virtual realities and hyper-realities (Diocaretz 2006a). Moreover, beyond the physical, at the cognitive level, codes and passwords are required and must be remembered to access buildings, personal bank accounts, private email, and digital devices, to name just a few. Thus, for the connected persons, their modes of being in the daily digital world require multiple private and shared systems beyond the body area.

Presence Studies and Being-in-the-digital-world

As the human subject reacts to intelligent and responsive technology, the mechanisms and systems may also intervene in the social construction of daily life. What are their boundaries and relations in a post-PC era? Can we trace them? If the answer is yes, can they be controlled, and by whom? I shall refer to two approaches to this question: If we take being as a dynamic process determined by living and experiencing the digital, one line of reflection is the notion of "presence", including the emotional experience (Huang & Alessi 1999); the other one is the shift into being data and information, and thus becoming vulnerable as a social being. Through *presence* and existence in the digital universe it is possible to explore the digital dimension of being. The notion of "Presence" has been developed from several technical areas and abundant literature exists (see, for example, PRESENCCIA 2006; 2007). It was originally developed from the idea of "tele-presence" and has been defined as "being there", and "the sense of being present in a particular environment" (Riva, et al., 2003); as the "subjective feeling of 'being there'" (Carassa et al. 2004), and as "Being-in-the-world" (Zahorik & Jenison 1998). It has played a role as a key concept for studies on "how to produce 'real'-feeling experiences and the impact of associated technologies on social dynamics" (PEACH 2009). Moreover, it has been found to be a useful research strand for design, evaluation, and the engineering of media technology. It needs to be mentioned that Heidegger's concepts have originally inspired Presence Studies (Sheridan, 1999).

In cognitive science "Presence" involves the embodied mind (Varela, et al. 1991) and in other fields it has been developed for communicative competence and for the architecture of the mind/brain (Tirassa 1999). In situated cognition (Clancey 1997), it refers to the perception of a physical environment which the subject can relate to and identify with. Presence is also a critical element for cyber-therapy and biotherapy uses in clinical psychology and neuroscience, where it appears frequently in relation to verbal interaction. It is also fundamental for the study of cognitive factors on how humans relate to reality and their environment (Huang & Alessi 1999), and how they are affected by their dependence on Virtual Humans, Virtual Reality, and robots. Several questions related to presence are relevant to the perception of physical experience, and cognitive performance.

A less explored area is the imaginary where presence can be fruitful, given that if the outer physical environment is not clearly distinguished from the person's own inner world, the cognitive processes may be much more complex. Ambient Intelligence will enhance those fuzzy environments so it will be a fertile area to explore presence in any of the previously mentioned perspectives.

From the Presence field I draw the notion of "being-in-the-digital world" (Ijsselsteijn & Riva 2003) to refer to one level of being data and information which is not directly perceived by the subject. It is outside the realm of the senses, yet part of being. This is because the subject may not be aware of the digital entities connected to being which circulate in the Web. Being data and information means that the digital is part of the subject, just as a book or text or image is part of its author.

In the digital society, people are increasingly also partly codes, binaries, and data, therefore partly constructed through and by "digital beings". A "digital being" (Eldred 2009: 43-53) consists of the "binary code" you are all familiar with, as an "ordered, finite sequence of binary numbers," read and understood by other digital entities created by the programmer, and functioning as subaltern of pre-programmed commands. But digital beings are also the manifestations of these codes, such as images, film, voice, text, emails, SMS, and virtual identities, which enter into an ontological relation with the human subject. In other words, if the digital information originates from you, or it is related to you, it is you, as the many ways in which self-representation and representation construct the networked digital subject.

Privacy and Being in the Web: The Social Networks

In the history of the Internet a social breakthrough happened when Tim Berners-Lee chose to create it as an open non proprietary technology. It is my profound belief that "the network society" (Castells 1997) would be different if the WWW and the Internet had been an invention restricted to a few institutions and corporate bodies. The Internet and the related ICT arise thus as tools for material semiotic processes for growing numbers of groups. Techno-scientific and cultural practices begin in this way to be closely intertwined in the realm of the social. In the context of the birth of a participatory web we can speak of a "revolution".

In the framework of human-to-human communication strategies, the social networks evolved in the Internet to satisfy the need for digital self-expression, self-assertion, self-determination and the desire to form individualised social communities. Here a distinction needs to be made between the social networks as community-building pathways, and the social network services and providers. The (social) network services are companies using and sharing individual private information with other businesses for commercial purposes. For the network members the aim of sharing private interests through audio-visual and text files with friends, family and acquaintances, and the social desire to form individualised communities, as well as to make personal achievements known, fulfill the need to communicate more openly, and collectively, and to exist and belong in the world. However, this social desire to be known and popular by numeric accumulation of contacts exposes the person to a weakened sphere of protection in the disclosure of sensitive personal information about oneself and others (Gaudin 2010).

The personal information and the member's profile become accessible and retrievable in different contexts, flowing independently from its creator, even after he or she has deleted it. The personal descriptions which later one wants to change or may regret having put online remain somewhere in the digital universe. This dimension of the digital in the subject shows a *social vulnerability*, caused, not by the technology itself, but on the one hand, by the lack of information and lack of awareness of what it means to inscribe one's digital being into the social network, and on the other hand, by the (social) networks providers' procedures and their services.

The case of Facebook is relevant. The disruption of this social network service, as recently reported, involves the privacy settings and confusing opt-out choices which leave the participant unable to control the levels of distribution and access. At first the information on Facebook was restricted by the user, and this was respected by the service provider. Now it is no longer under the control of the participant and Facebook's tendency is to enforce an increasing public sharing without the members' knowledge (Bankston & Opsahl 2010). Social network providers have policies, and include them as part of the signing-in process; however, as shown by Opsahl (2010), Facebook has changed these policies periodically in 2005, 2006, 2007, 2009 and 2010, without notice, with the consequences that the control over privacy settings and access to information

progressively diminishes.The case of Facebook's privacy settings and procedures imposed on its members is still unresolved, and reveals the strong need for network participants, including children and teenagers, to be educated on the indispensable need to be more in control of the protection of the subject's networked digital being.
Furthermore, in the light of emerging applications of geographical location for groups and individuals, the risk of involuntary disclosure of private location as a violation of the personal area networks requires new measures to protect the privacy of those members who do not wish to make public where they are at a given moment or which places they frequent.

"Being-in-the-digital-world" means being trans-coded into information in the maze of heterogeneous data linked and hyperlinked, called the "linked data Web," (O'Hara & Shadbolt 2010: 39-41) contained, for instance, in databases, and websites. The threats to online privacy have many levels. A common online practice involves entering personal information, a simple act passively fulfilled, compelled by the promise of a service or use of an application, for which registration, and acceptance of the terms and conditions are required. Another instance is the query typed out of curiosity or necessity in search engines: these turn into the user-generated ontologies of the individual, which the search engines themselves collect, classify, and store as programmed, and which they subsequently use through distributed targeted advertising under the business model of personalised mass publicity.

Although one must recognise the advantages of the Data Web, "...threats to personal privacy will also increase as boundaries blur between personal information published intentionally, [...] published conditionally [...] and information over which the subject has no control" (O'Hara & Shadbolt 2010: 39). Along the same argument, it is crucial to ask not only whether anyone owns this data and information" (O'Hara & Shadbolt 2010: 39) but also who owns what is part of the subject's being-in-the-digital-world? It seems that the private individual who is contributing substantially to the Web ontologies does not own his/her own private data. Another question is whether proprietary models of online data and information ownership about individuals must be dealt with separately from the rights to privacy, since this principle does not exist and, to my knowledge, there is no policy on it. The same questions are relevant for the familiar cybercrimes of identity theft and fraud.

In conclusion to this section, I have applied the subject's social and privacy vulnerabilities to the notion of being human (,) digital which are dimensions of existing in the digital universe, and of being digital in the networked society.

IV

Humanistics and the Future and Emerging Technologies (FET) in ICT

Humanistics and the Future and Emerging Technologies (FET) in ICT

One area that interests me is the Future and Emerging Technologies (FET) strategy of the European Union ICT programme which has existed throughout the Sixth Framework Programme (2002-2006) and continues in the Seventh Framework Programme. Its aim is to define the priority research themes and technological development of the future in Europe towards the year 2020. It comprises a policy agenda as a European vision for a long-term strategy to promote and carry out investment in "higher risk research" in the field. FET includes applications, infrastructures, components and systems, and devices and services as solutions for people and 'cities', not only for ICT, but also for overall interactions to "facilitate daily life". Therefore, I believe that relevant societal questions need to be addressed especially because a key role has been assigned to ICT and technology as agency to transform society.

Launched in 2003 as a foresighting vision of research for the next decade it announced a "new technological revolution", based on the concept of the "Converging Technologies for the European Knowledge Society" (EC 2004). Its potential included the 'technology-enabling-sciences'. The notion of convergence had a focus on the close interrelations amongst Nano-, Bio-, Cogno-, Information technologies, and the social sciences. In 2009 FET evolved into a European vision of a long-term strategy to promote 'higher risk research" in ICT and FET. Several key policy documents have been published which show an incipient social-friendly approach: worth mentioning are the two European Commission Communications: "Moving the ICT Frontiers – a Strategy for Research on Future and Emerging Technologies in Europe" (EC COM 2009/184), and "A Strategy for ICT R&D and Innovation in Europe: Raising the Game" (EC COM 2009/116). Currently, FET for research is a "pathfinder" to identify and shape "radically new information technology" for "scientists and engineers venturing into uncharted areas beyond the frontiers of traditional ICT" (EC COM 2009/116: 3) including the new field of quantum information science. The FET type of research "produces new practices that change the way research is conducted" and explores new unconventional ideas and scientific paradigms that are "too-long term or risky for industrial research". Thus, the new focus is on a model of research that is "high-risk", "*foundational*", "*transformative*", which, significantly, should lead to "*science-based policy-making*" in all Member States. In 2010, *emerging societal challenges* play a larger role in the field of FET, specified as socio-economic issues aiming "to improve people's lives," and "to help them

live independently." Of special relevance are the projects which will address the demographic changes resulting in the ageing population, and which will help them "live independently". This direction has also been included as one of the seven priority objectives of the European Commission Communication on "A Digital Agenda for Europe" (EC COM 2010/245). Thus, e-care and e-health applications are central. From a general perspective, the advantages of e-surgery, tele-monitoring, tele-care, and tele-medicine are self-evident. Another area of innovation is ambient intelligent technology, which I will illustrate through the ambient assistive living technology policies.

Ambient Assisted Living (AAL)

As a way of implementing the appropriate policies, the *Ambient Assisted Living Roadmap* (AAL Roadmap 2010) has been prepared on the basis of three main social trends: demographic, economic, and technological (AALIANCE). This roadmap outlines a set of social and technical needs. The analysis the BAN, PAN, nAN, and on being in the digital world which I have previously outlined is fully relevant, since the concept of Ambient Assistive Living (AAL) is based on the recognition of the person's different environments and his/her mobility between the virtual and the physical spaces: the first is AAL@home, rather self-evident; AAL@mobile is for health, rehabilitation and care; AAL in the community is aimed at facilitating social inclusion; and AAL@work is for elder workers and requires attention to employer-elder worker relations. The enabling technologies —which at the moment exist in scattered ways in Europe, and most are yet to be invented— will have to be "embedded", "personalised", "adaptive", and "anticipatory". In short, funding in AAL will favour electronic environments as a combination of "ubiquitous computing and intelligent social user interface". The Roadmap is a programmatic document, therefore much needs to be developed, conceptually and strategically. One section includes bio-robotics for personal autonomy and for care, as well as cognitive and companion robots, a topic for which our research team at the Tilburg center for Cognition and Communication is known in the field of Human-Robot Personal Relationships (HRPR) through its two annual conferences (2008; 2009). I was honoured to be the Chair of the very First International Conference on Human-Robot Personal Relationships in 2008, and with Jaap van den Herik, to be the co-editor of the proceedings (Diocaretz & van den Herik 2009).

Social Robotics and Humanistics

General Robotics has been used for decades in interplanetary or space exploration, and in military and industrial environments. Urban robots are starting to be developed for cities. In general, these have been robots designed as machines and as parts of machinery, used mainly as tools and devices to facilitate or execute very specific tasks. Recent projects in the same direction include prototypes of police robots, of rubbish gatherers such as DustCart (2010), and garbage trackers. Robotics is noteworthy in situations to rescue or detect survivors in disaster sites, as well as for bomb detection and retrieval. Other types of robots are widely used in medicine, which have proven to be very effective and accurate for surgery and other applications.

Quite a different field is humanoid robotics research. Humanoid robots exist but are still at an incomplete level of development and are not likely to reach mass production so soon. The leading and oldest humanoid robot is ASIMO, acronym for Advanced Step in Innovative Mobility (Honda 2010), my personal favourite. It has taken the Honda team of researchers more than two decades to develop it to its present form. ASIMO is the first walking humanoid robot and it was designed to help people. It has carried out a few extra-curricular activities, so to speak, to entertain, such as conducting the Detroit Symphony Orchestra as it performed ''The Impossible Dream,'' on May 13 2008, in a real-time sold-out concert. ASIMO is recognised as being the world's most advanced humanoid robot as its own official website states. Another achievement, not humanoid, is the AIBO pet companion developed by Sony, launched as early as 1993, owned by 100.000 people in 2002 (Pickrell 2006).

The most striking are the Japanese humanoid robots developed by Professor Hiroshi Ishiguro at Osaka University. His humanoid robots are exceptional for their human likeness. After Repliee Q1 (2010) which was a replica of his 4-year-old-daughter, he created Repliee Q2 based on the image of a female TV presenter, followed by an android as a copy of himself (Ishiguro 2010). His latest creation is Geminoid F, another adult female android. Prof. Ishiguro's objective is to know what is human, and to study people's behaviour when they interact with a humanoid robot. The development of humanoid robotics is, in my view, highly relevant to HRPR research in social robotics, especially if the aim is to develop robots as companions or assistants to humans.

Service Robotics

The "Beyond Robotics" initiative (2004-2008) of the FET programme was introduced to foster the development of cognitive robots whose "purpose in life" would be to serve humans as assistants or "companions". Part of this innovation is directed at the development of "Robotics and Embodied Systems" for the next 10 to 20 years. A January 2010 report (EC 2010) recognizes a number of technical and theoretical challenges (EC 2010: 7) encountered in the growing field of service robotics and human-robot interaction. In this context I shall add some challenges that are not included in the previously mentioned report.

For instance, we can imagine that if a person lives in a small apartment, or in a large house with stairs and many doors, the robots can be designed to perform a number of tasks according to the kind of dwelling. There is agreement that the services will have to be personalised to match individual needs. At an even earlier stage, however, a preliminary question needs to be investigated: whether robotic assistance and companionship is desirable and welcome by those for whom it is intended. Many other questions unfold. It is evident that human-robot interactions need a new focus on the human *personal* relationships. The doubt about the acceptance of the artifacts and systems can be clarified by actually delving into the preferences of specific groups and of individuals, through research from the social sciences and, especially, from the Humanistics perspectives. Moreover, there is still insufficient research on people's perceptions of robots, and about the types of relations humans can engage in with robots, to name just two fundamental humane research questions. From a multi-disciplinary perspective, there are various methods possible. For example, I concur with Antti Oulasvirta who has written about "Finding Meaningful Uses for Context-Aware Technologies" and human-computer interaction (HCI). He put forward a "Humanistic Research Strategy", as follows: "The prevailing strategy to find use potentials could be called *technology-driven*. In short, it takes technology as granted and attempts to find some minimum use case that justifies its existence. This can be contrasted by the humanistic strategy. Humanism believes in human rationality, creativity, and morality, and recognizes that human values have their source in experience and culture. [...] People acquire purpose in life through developing talents and using them for the service of humanity." (Oulasvirta 2004: 266).

Three Societal Challenges in AAL

I shall show the need for Humanistics approaches through three societal challenges. The new branch of robotics for home care services to improve people's lives for the "growing elderly population" is seen as the solution to help the ageing humans to "stay independent". The EC Communication on the Digital Agenda for Europe states that the AAL programme will allow "a more independent and dignified like for people who are frail or suffer from chronic conditions and for persons with disabilities" (EC COM 2010/245: 29). Without any doubt, the applications mentioned, fall prevention and help in cases of dementia, are two important targets to be implemented by 2015. This plan is crucial for patients, but additional applications need to be considered with caution, to prevent generic assumption leading to generic implementation, targeting the "elderly population" without any distinctions.

Let us consider two scenarios for ageing well with robots. Let us consider the first scenario: If we assume hypothetically that the Ambient Assisted Living and the robotics systems will work effectively, with their architecture, networks, actuators and sensors, and interoperability, etc. allowing people to *stay independent*, this may solve the problem both for care givers and for relatives who cannot visit the person often or at all, but who will depend significantly on the relevant technologies. The second scenario can be as follows: imagine yourself living with a robot assistant or companion —humanoid or not— and also living surrounded by Ambient Assisted Living. If somebody calls, you see her on the screen. You can call too. Your food and other daily needs are delivered to you. Everything works, nobody needs to come to see you. The technology is working. You are doing fine. Although it may be an attractive prospect for a technologically advanced society, the envisioned kind of beneficial independence may potentially also unleash a new kind of lonely world. Ageing well also involves social relationships, closeness to another human, sharing feelings, affection, even love... Daily life is already increasingly individualistic. In addition to this, many among the ageing humans of the present and the near future are very likely to belong to the 150 million Europeans who have never used the Internet and ICT (EC COM 2010/245; EC MEMO/10/190, 2010: 2). This large group of elderly citizens, 150 millions, constituting the still unrecognised "not-connected" in our societies, are not digital born, yet many amongst them will be expected to live and function in the *Otherness of a technological continuum*. Consequently, it is necessary to consider these three factors, in order to prevent the consequences:

The risk of not only feeling alone but of being lonely which already is a reality in some Member States among the elderly, and the risk of being and having to exist under the condition of loneliness. Next is the risk that the frequent or continuous experience of AAL may trigger a new kind of technology-based dependence both for the beneficiaries, their families, and for the professional care givers. Last but not least, the risk of imposing a technology on the technology innocent or inexperienced, or not-connected, needs to be prevented.

Before I conclude, I would like to return to a reference I made previously to the generic use of the target group of AAL. In the policy and research discourses of European FET and general technology which I have been analysing, the notions of "the elderly" and of "the ageing population" are used as generic terms, and tend to be applied in the same way, as a mirroring effect, in EU-funded projects and working papers. From social robotics research and the results of several experiments presented at the conferences on HRPR in 2008 at Maastricht University (Diocaretz & van den Herik 2009) and other conferences on the subject, there is evidence of the importance of personal preferences, of ethical and affective factors, of aesthetics and gender contexts from which individuals react to the look-and-feel of a robot or of a technological artifact. The same is valid for the more evident cultural and linguistic diversities in Europe, often a crossroads of variables; moreover, in the arts and rituals of giving and receiving, in expressing or containing feelings, in forms of enjoyment; all these factors and many more play a role in the same way that the different forms of living with technology are *neither a given nor universals*, but are *contextual, human-centred and individual*.

These aspects need to be incorporated into the long-term vision, and explored before the design of the technology is achieved. The LivingLab model of experimentation in real-life environments with specific groups as co-participants in the design process, which I have highlighted in previous research using Finland as best practice and a case-study (Ballon et al. 2005) continues to be the most appropriate and effective method for emerging technologies intended for human beneficiaries. In this context, Humanistics can certainly contribute significantly if integrated into truly multi-disciplinary techno-scientific transformative research and development.

Therefore, I propose a consideration of three questions in the context of research for prospective robotics and Ambient Assisted Living:

1- How is human loneliness as a new type of digital social exclusion prevented?
2- How is technology-dependence, not only for those who are expected to age well, but also for the carers and care organisations prevented?
3- How is imposing a technology on the digital innocents within elderly groups avoided?

A Recommendation

In addition to the generic use of "the elderly" explained above, the current social discourses of policy and decision-making refer to the beneficiary of AAL and ICT as a mere "consumer", "user", and most recently as "the new digital consumer". These terms tend to perpetuate an objectification and commodification of the persons for whom these technologies are intended. It is important to prevent the individual in the knowledge-based economy becoming objectified by the market, government, and policy, as these ontologies reveal. They also diminish the human dimension which can be collectively discarded or put in the background, causing socio-cultural and other specificities to become the invisible and supposed givens unaccounted for in the logic of economy, research, and innovation, for the sake of progress.

V

TICC - The Tilburg center for Cognition and Communication

I was privileged to hold the Socrates Chair at Maastricht University, where my cooperation with Jaap van den Herik and Eric Postma started. Subsequently, I was very pleased that the Tilburg University Authorities were willing to host the Chair. There is a very positive multi-disciplinary flow in the Humanities at Tilburg. TiCC started as the Tilburg center for Creative Computing in 2008. As of April 1, 2010 we have a new Center in which two research groups officially merged to form the Tilburg center for Cognition and Communication. I feel comfortable with the research intentions of the group and I wish to contribute with my work. The connection with my European policy work will be strengthened by your supportive actions which I have experienced in the last two years. All in all, I see a bright future for TiCC, and a relevant place for the subject of "Humanism in the Digital Society" of the Socrates Chair.

Conclusion

I have presented selected reflections on being digital in the 21st century, in order to delineate a blueprint of research and education for a new form of Humanism, as Humanistics, and to propose a focus on the prospective applications of technologies being developed as well as future ones. I have stressed the need to address societal challenges, as well as to bring the human dimensions to the foreground through a more participatory multi-disciplinary role of Humanistics so that the novel technologies materialise into truly beneficial applications for society. I have also underlined the links between Humanistics and future and emerging technologies (FET) in an interaction which can be a great advantage to foresight studies and to all other fields of research in the techno-sciences. Humanistics and humanism are enabling trans-disciplines for an understanding of the societal challenges that can be identified by looking critically and constructively into the interplay between technological and human transformations, before, during, and after the time when the technologies are developed and deployed.

I have expressed my vision in order to show that never before has there been a more urgent need to bring together humanistic principles and the techno-scientific innovation of the 21st century.

The future is human.

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