

We Are Super-Humans: Towards a Democratisation of the Socio-Ethical Debate on Augmented Humanity

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ABSTRACT

Research in human enhancement technologies (e.g., nanotechnology, genetic engineering, robotics et cetera) is exploding bringing unforeseen solutions that will expand human capabilities further. Therefore, new socio-ethical issues need to be continuously addressed. In this scenario, we argue that a revolution in addressing these issues is needed and that we should enable a democratic process to cause broader reflections on the future augmented humanity. We will present the SuperHumans.ch project as an example of educational and collaborative thinking on the future of human enhancement.

CCS Concepts

• Social and professional topics~Codes of ethics

Keywords

Human enhancement technologies; Ethics; Democracy; Education

1. INTRODUCTION

The technological evolution thoroughly modified the development of human society and influenced its evolution [4]. The history of technology is as ancient as humankind; Basalla defined it as the history of artefacts. In this vision, the technology is the summation of previously invented ideas, the combining of available knowledge and existing cultural elements in order to form new elements [4]. This leads to a vision of technological evolution as a successive line depending on previous inventions, which is also accelerating because the amount of previous material is growing exponentially. This incessant evolution led to the invention of the computer, which caused a profound revolution in human society. The history of computing machinery is quite recent, indeed the first accredited working programmable, fully automatic digital computer was the Z3 invented by Konrad Zuse in 1941 [27]. Albeit computers are young, their evolutionary speed is so fast that Moore modelled it with an exponential curve [17]. Indeed, Moore's law modelled the speed of the hardware miniaturisation finding a relation between the number of transistors in integrated circuits and time. This law is based on the observation that the number of transistors on integrated circuits doubles approximately every two years. The hardware miniaturisation was the main factor that allowed a shift from the

mainframe machines to the personal computer, to the smartphones. Moore's law is still respected and this led to the birth of many different form factors for the PCs but it was not the only parameter that determined the contemporary technological revolution. Waldner analysed this evolution and represented how other factors (i.e., evolution of power supply and communication means) played a crucial role in the process of circuit miniaturisation that led to the current ubiquity of computers [24].

Back in the late 1940s, the innovative developments in science induced Wiener to predict the dawn of what he defined as the "automatic age": a sort of "second industrial revolution" where electronic computers and other new and powerful information technologies would profoundly modify human society bringing an enormous potential for good and for evil that would generate a staggering number of new ethical challenges and opportunities [25]. Wiener founded his new branch of applied science and identified some social and ethical implications of electronic computers; he was the first to explore the possible effects of information technology upon key human values like life, health, happiness, abilities, knowledge, freedom, security, and opportunities [26]. Although Wiener paved the way for the creation of a new branch of ethics concerning the effects of computers and information technology in human society, it is not before than the late 1970s that Maner officially founded the new field of what he called "computer ethics" [14]. Since then, the debate on the socio-ethical implications of information technologies continued and, at the same time, the evolution of computers kept accelerating. Nowadays, computers are pervasive and the connection to the Internet is almost ubiquitous. Technology permeated the human society and profoundly changed humans' behaviours and their values, exactly as predicted by Wiener. However, at this point in history, we are facing a new shift in the evolution of technology and its effects on humankind. Indeed, computation technology changed how people behave, think, communicate and act but this happened always in the limit of natural human capabilities. The recent scientific discoveries and inventions showed that technology is starting to modify also human capabilities, pushing them farther than their natural limits.

In the next section, we show some examples of the progress of human enhancement (HE) technologies and the predicted evolution of the augmented humanity. In Section 3, we will introduce and describe the current status of the ethical debate on the effects of HE technologies. In the following Section, we will propose a democratic process for a broader debate showing the example of the SuperHumans.ch project. The last Section will be dedicated to the conclusion and the final remarks.

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2. HUMAN ENHANCEMENT TECHNOLOGIES

Humanity always tended to improve itself and with this purpose created new tools and developed new technologies. Bostrom and Savulescu state “all technology can be viewed as an enhancement of our native human capacities, enabling us to achieve certain effects that would otherwise require more effort or be altogether beyond our power” [6]. One could argue that using a phone agenda instead of memorising the numbers is a sort of human memory enhancement. Even mental algorithms to calculate basic mathematics could be considered a kind of enhancement of our mental capabilities. However, they argued that if the concept of HE is stretched to this extent, it is not possible to use this concept as a paradigm in the domain of ethics and it would make impossible to categorise technological inventions in a proper way to analyse the socio-ethical effects on human society. Therefore, we need to provide a definition of HE in order to understand which technologies can be classified as HE technologies. A generic definition of HE is “the improvement, amelioration or creation of human capabilities, before or after birth, through the use of various types of technologies linked to many fields of science” [16]. This definition comprises both “traditional” (or called also “natural”) and “modern” enhancements. The “natural” methods include all kinds of techniques that humans used during their evolution to boost their capabilities beyond the species-typical level or statistically-normal range of functioning for an individual [8]. These techniques include the capability to modify the surrounding environment, mental and physical training, the creation of tools, and the establishment of social structures. Nowadays, these techniques encompass the use of computers and information technologies. The recent progress of emerging and converging technologies, such as nanotechnology, biotechnology, information technology and cognitive science (NBICs), promises unforeseen significant changes to the individuals’ biologic and psychological characteristics that will profoundly modify the human society. The NBICs are evolving very rapidly, at an accelerating speed that is comparable to the exponential integration of transistors mentioned in the previous section. The Carlson Curve describes the biotechnological equivalent of Moore’s law and predicts the exponential growth in performance and the decreasing of costs of a variety of technologies, including DNA sequencing and synthesis [7]. The current main objectives of the NBICs consist in increasing human lifespan (aiming at immortality), improving mental skills, bringing more happiness, providing stronger bodies, increasing fertility, and choosing genetic characteristics of future offspring [16]. The aforementioned examples are addressed as “modern” enhancements and another characteristic that makes them different from the “traditional” ones resides in the progressive integration in the human body [13]. Lin and Allhof report an example to depict the difference between the concepts of “traditional” and “modern” enhancements: the use of portable devices that enable the access to the Internet are an example of “traditional” enhancement, while an hypothetical chip implanted in a human brain allowing to do the same thing is an example of “modern” enhancement [13]. In both cases, the rapid access to infinite knowledge (consisting of the gargantuan amount of information available in the global network) represents the enhancement of the human capability of storing information; however, integrating the device in the human body can bring an unprecedented advantage, which consists in the easier, immediate, and “always-on” access to the new capability as it were a natural part of the human being [13]. The integration of a technological

device in the human body allows the establishment of a more intimate relationship with it, which evolves beyond the simple concept of ownerships entering in the more intimate notion of personal identity. Moreover, it avoids problems linked to the physical availability of external tools (e.g., losing or forgetting a device) and resources (e.g., energy supply).

We already represent the first generation of humans who have almost ubiquitous access to the Internet through mobile and wearable devices; we can effortlessly access an infinite amount of information and instantly communicate with people thousands of kilometres away in ways that were unimaginable four decades ago. This has already changed society influencing how people communicate (e.g., social networks), act (e.g., GPS) and think (e.g., searching engines). Furthermore, this technology even if considered external can implement profound changes in human development. It has been observed as being able to modify the human brain functions in order to adapt our mental skills to the new capability. For instance, in the retrieval of information through a searching engine, scientists observed that expert users have different brain activation patterns from naïve users [23]. We can imagine that the future generations will have the capability of connecting to the Internet directly from the brain, which will further change the way we think, perceive education and conduct researches. It could be possible that we will be able to instantly select and directly process the information at every moment. We could develop a communication system that will enable us to communicate through thoughts with our relatives and friends, a technological form of communication very close to what we call telepathy. Obviously, these possible future “modern” enhancements will raise further questions about how it will change the society and about the impact that they will have on the life of individuals.

Another important point in the categorisation of HE technologies consists in defining the distinction between therapeutic and proper enhancing applications. In the first case, NBICs are used as a treatment to heal or improving health conditions in order to restore normal functioning; in the second case, true HE comprehends the application of technologies that aim at improving abilities and characteristics beyond normal functioning. In this case, HE “is opposed to medical interventions that aim to treat a disease or alleviate its burdens” [16]. An example of technology that is currently used in both manners can be found in the current evolution of artificial limbs and exoskeletons. At the MIT, a robotic prosthesis has been developed in order to allow amputees to dance again after their accident [21]. At the same time, the Defense Advanced Research Projects Agency (DARPA) is developing prostheses and exoskeletons able to enhance the physical abilities of healthy soldiers in order to enable them to reach strength and speed beyond the human natural limits [18]. However, this distinction is not always so sharp and the case of the runner Oscar Pistorius is a perfect example. The South African sprinter had his legs amputated when he was an infant and now runs using artificial limbs at a professional level [9]; he was able to enter the 2012 Summer Olympics. Some argue that his prostheses provided him with an unfair advantage since these artificial limbs give considerable spring and do not need blood circulation [3]. Therefore, some considered that Pistorius’ prostheses gives him an enhancement that should not be allowed in races with normal runners. This means that even if Pistorius required these artificial legs in order to restore his normal locomotor function, these can also be considered as enhancement technology.

3. HUMAN ENHANCEMENT ETHICS

The previous section already highlighted one of the many issues present in the field of HE ethics, namely the contraposition between enhancement and therapy. Generally, “therapy aims to fix something that has gone wrong, by curing specific diseases or injuries, while enhancement interventions aim to improve the state of an organism beyond its normal healthy state” [5]. However, there are several issues related to the distinction between therapy and enhancement. The first issue resides in the definition of health and disease [16]. Moreover, the therapy-enhancement dichotomy seems to be a problem of the future since contemporary medicine already includes non-therapy practices, such as cosmetic surgery [5]. Another issue is related to defining the human standard limits since capacities vary continuously not only within a population but also within the lifespan of an individual [5]. The contraposition between therapy and enhancement makes difficult also the classification of technologies that aim at increasing the human lifespan [5]. In fact, it is unclear if interventions aiming at reducing the probability of disease and death can be compared to techniques able to slow the aging process. The lifespan extension brings the unprecedented prospect of the feasibility of becoming immortal, which of course involves sequential and simultaneous opportunities that generate a myriad of ethical consequences that HE experts are still examining [10].

The HE debate is developed on many different levels. Interventions can aim at enhancing different aspects of human beings. For instance, it is possible to improve physical abilities, as well as cognitive skills, or enhance mood and personality. Each type of intervention brings different ethical consequences. For example, in the case of physical enhancement it is an open question whether to allow the use of NBICs in professional sport and competitions (already doping is a hot topic). Similar concerns rise with reference to the case of cognitive enhancement, in particular, it is not clear whether using these technologies constitutes a form of cheating in specific contexts (e.g., exams). The improvement of mood and personality is even more difficult to be classified and, therefore, it is hard to decide what changes in a person’s mood count as improvements. All these enhancements raised questions about the authenticity of personal achievements. In fact, the possibility to effortlessly enhance selected capabilities can substitute the experience of authentic achievements, reached through hard work and training, with “hollow victories”. This effect could diminish the character of the users [22], and alienating them from themselves and those around them [2].

Another important topic in the HE ethics debate concerns the selection and improvement of abilities and characteristics of future offspring [1]. Advances in NBICs promise future interventions that will allow parents to genetically manipulate embryos in order to produce children with desirable qualities. The first issue related to this kind of enhancement is intrinsic in the moral status of the embryo, which is currently a hot topic in bioethics. Another eminent ethical concern regards human dignity and how the application of these technologies can undermine it. Two main issues were raised: the weakening of the rights of the unenhanced, and the dehumanisation of the enhanced [5]. The latter is part of a broader debate on the implications of new biomedical enhancement interventions for our common understanding of human nature and the future of our species. The human race could jeopardise its identity since enhancements could compromise the central normative features that characterise humanity [15]. At the same time, enhancement enthusiasts argue that this is the opportunity for humans to change humanity for the

better [11]. It is however unclear how to define what is meant by ‘better’. For some, something is considered an improvement in regards to a former state. For others, something is better only if it has improved towards a given goal or according to a certain ideal [19]. The former sense opens the possibility to have public discussions regarding where do we want HE to lead us as a species.

We can observe that the experts’ opinions in the domain of HE can be coarsely classified in two main movements: transhumanists and bioconservatives [12]. Transhumanists approve HE and seek “to liberate the human race from its biological constraints” [12]. Their opponents are the bioconservatives, who accept enhancements only for therapeutic purposes.

4. TOWARDS A DEMOCRATIC DEBATE

The previous section highlighted some ethical issues of HE. Currently, there is no consensus on how managing the ethical consequences of HE, but also on the definition of what HE is. To provide a definition of HE, we should first identify what health and disease are, and to determine the reference state that could be taken as reference point to assess any possible improvement. Hence, Menuz et al. proposed an approach that is based on a personal concept of enhancement [16]. This strategy acknowledges the difficulty of finding a consensus on a global definition and focuses on a reference state, called the “personal optimum state”, which varies from one individual to another. The “personal optimum state” is constituted by individual physical and psychological characteristics and influenced by six determining factors: political and social norms, rules and values, environmental factors, passive coercion, unconscious personal goals, statistically defined attributes, and personal considerations. Roudit et al. have taken a more holistic approach looking at humanity as a whole [20]. Humans share in common some central capabilities that are essential to live a good human life. Those capabilities, not fixed in time, can help guiding the use of HE: enhancements that diminish the capabilities should not be considered ethical, because dehumanising. Both of these approaches provide an important step for the debate on enhancement because it moves the discussion beyond the walls of academic institutes and transfers it to an individual level, involving the citizen to take part of the responsibility in choosing whether to enhance or not, and in choosing what capabilities should be considered essential to live a good human life.

We argue that the general population should be implicated in the debate on the socio-ethical consequences of HE. To achieve such engagement, it is important to provide the tools to analyse this debate. It is the scholars’ responsibility to raise awareness about the impact of the converging NBICs; moreover, since it has been predicted that we are at a turning point, where these considerations will profoundly influence politics, this is also important to help people find a personal orientation in tomorrow’s society [12]. We encourage experts to organise dissemination activities and public events in order to provide opportunities for education and reflection for citizens, in particular for the younger generations, who will be directly concerned by the decisions taken for the future regulations of the augmented humanity. Moreover, scholars should support collaborative thinking, since this could provide the chance to generate unprecedented thoughts and perspectives on the issues concerning HE and its impact on society.

SuperHumans.ch is a project that explores the opportunities of involving teenagers in an experiment of educational and

collaborative thinking on the future of HE. In the course of this project developed in Western Switzerland, the teenagers have been invited to a mini-academy of about two days, where they had the chance to learn about HE and its ethical consequences from some experts in the field. During the presentations, the teenagers had the opportunity to interact and ask questions to the experts about all the topics concerning HE. Then, they had the opportunity to discuss in groups about the ethical consequences of the adoption of technology. Teenagers are avid users of technology and this event provided them with the chance to reason about its consequences and the possible future development and its impact on society and individuals. During this mini-academy experience, the teenagers participated to two workshops: the first was dedicated to teach the students different artistic forms that they could use to express their vision about HE; the second one was an accelerated class for writing, in order to enable them to articulate complex problems such as the HE with reference to their values. The students that attended this mini-academy had the opportunity to produce artistic oeuvres to express their vision on HE that are currently published on-line and that will be shown in different exhibitions in Switzerland. Moreover, these young students are collaboratively writing a book on HE ethics from their perspective that will be published in 2016. This will be the first time that non-experts have the chance to express their opinions about this topic.

5. CONCLUSION

We have shown how the evolution of technology modelled human history and that we are now at a critical point where the emerging technologies promise to bring radical transformations of the human capabilities with unprecedented consequences for humankind. We suggest a democratic approach where scholars in HE are not the sole decision makers but where the involvement of all the population is encouraged in order to enlarge the debate. The scholars have the responsibility to educate and guide the non-experts and lead them towards an increased awareness that will enable collaborative thinking. As an example, we presented the SuperHumans.ch project, which represents a first attempt to involve teenagers in the debate on the HE ethics. It was intended as an experience where art, science and philosophy met and provided the students with the means to express their opinions, and where collaborative thinking could enable broader reflections on the future of the augmented humanity.

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