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Do Cyborgs Dream of Sheep

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Abstract

The idea of Cybernetic Organisms as a part of our everyday lives seems like something straight out of science fiction, but with the rapid development of technology, it provides a glimpse at what may be our future reality. With this, certain issues will arise. Can we still claim to be human when our reliance on these cybernetic implants increases? How will we handle the implications of a split population: those who have been augmented, and those who have not? This paper will cover the many ethical issues relating to Cybernetic Organisms.

1 Introduction

The number of people with access to technology is increasing. Companies such as Xiaomi and Google have encouraged the expansion of technology worldwide through ventures such as more affordable and easily accessible cell phones, or Google's Project Loon designed to give more people Internet access. If this trend of technological advancement continues then the possibility of Cybernetic Organisms (Cyborgs) will become an even more viable possibility. While Cybernetic enhancements could potentially be extremely beneficial to everyone involved, allowing for increased physical

and mental capabilities. However, there are a multitude of issues that ensue if Cybernetics become common as cellphones or the Internet.

The first topic explored will be on the reliability of Cybernetics. As discussed in class technology cannot be one hundred percent reliable, and are at times much worse than that. For example, consider the case of Therac-25 where more than six patients were exposed to massive overdoses of radiation. Given the current dangers of poorly created software and hardware, when these risks involve physical alterations of our bodies, these risks are severely amplified. While cybernetics may be advantageous in some ways, such as the technology to return sight for those who have lost it, problems become apparent when people engage in potentially dangerous activities relying on the technology. If their implant malfunctions or presents them with false information, then lives will be lost.

Security brings up another issue with that of security. With the convenience of memory implants storing details such as our banking information would be increasingly easier. However, this also increases the likelihood of someone like a cracker accessing this information. At the same time artificial limbs may provide increased strength, but if someone gained control over them, then we would be at risk of becoming puppets.

The next topic will be on the implications on having two types of people; those augmented and those who are not. In a world where people enhance themselves, improving things such as memory or response times, then those who cannot afford or do not want these enhancements will be left behind. For example when an employer has the

choice between someone who will remember more and think faster because of cybernetic implants versus someone who cannot it is very clear which is more likely to be hired. This then raises the issue of whether there should be regulations on cybernetic implants, and whether the government should restrict the enhancements that people can have.

Another issue is on the humanity of cybernetic organisms, more specifically when one has changed so much of themselves can they still be called human. This concept can be compared to the Theseus paradox. Starting with a ship, (or a person in this case) if you replaced each plank piece by piece such that the resulting ship no longer contains any of the original wood, would it still be considered the same ship? If it is no longer the same ship at which point does it cease to be the same ship? If we used humans as the subject, when you replace every organic part of them with a cybernetic implant would it be correct to still label them as 'human'?

All in all, Cybernetics come with a world of benefits. Space travel would be easier if we needed less oxygen. We would be much more productive if we had an encyclopedia of information in our minds, rather than at our fingertips. But with these benefits come complications, and how we as a species handle these difficulties will influence how we shape our next technological revolution.

2 Safety

The safety of humans and animals that might interact with cybernetics is an extremely important concern. We know from our own history that new technologies can be hazardous when not dealt with properly. As shown in the MIM-104 Patriot missiles incident. After suffering a massive failure in the system to locate and intercept incoming missiles due to a drift in its system clock caused by a software bug. This incident resulted in the death of 28 soldiers. From our experiences, we know that there is no way for technology to be completely bug free. When dealing with technology that will be so intimately attached to our bodies, it brings up the question of whether such technologies should be developed in the first place.

The benefits of becoming Cybernetic Organisms are still being explored. The field of Transhumanism[8], although relatively new, explores the concept of Cybernetic Organisms replacing humans quite in detail. Transhumanism is a movement motivated to transform humanity by making technologies that improve human intelligence, as well as their physical and psychological capacities. We're steadily approaching something close to what Transhumanists are dreaming of. If one was to look at the state of current technology, and what we have achieved this isn't too far off. Our cellphones started as devices with the pure function of long-distance communications. But we have since then extended far past that capability. Nowadays we carry devices with us that are constantly connected to the Internet, a vast encyclopedia of information, easily accessible to everyone. This has been further expanded with the rise of wearable technologies. Like smart watches, optical head-mounted displays and wearable computers. These technologies are making humans all the more connected with computers

and because of that we're becoming ever dependent on them.

Already with current technologies we're seeing how problematic it is if they're not built properly. There have been multiple cases over the past few years of cellphones exploding in people's pockets and causing injury [7], due to the fact that the phones were cheap replicas of more expensive phones. This could be easily applicable to cybernetic implants. We know from experience that not everyone can afford the newest and most up to date technologies. Thus, many may go out and buy cheaper versions without the safety checks and quality assurances of their more expensive counterparts. When we relate this to components that people will integrate with their bodies the dangers are even higher. For example, in the near future a new cybernetic arm is released that allows workers to lift extremely heavy weights with ease. But a bug was introduced that causes it to move around chaotically. Potentially this could put many workers in danger. Such a bug is not that uncommon, as can be seen through an interview in Le magazine de la santé where a man's arm did exactly that.

There are many risks that come with humanity allowing itself to become cybernetic organisms, and whether these risks are worth it will be up for us to decide. It's very likely that we will need to have a new level of quality assurance for these devices. If they're not properly maintained and checked after then they are an even bigger risk than the technology we currently have.

3 Security

Every year, a copious amount of security flaws are discovered and raised. In this year alone, there was Heartbleed[10], a major bug in OpenSSL that affected millions of websites, which of course affected millions more users. There was also Shellshock[9], a major issue in bash that allowed attackers to execute any arbitrary command they wished on their targets. Issues like these will become even riskier when applied to cybernetic implants. For example one of the earliest technologies developed by researchers is known as Brain-Computer interfaces. Research on this technology began in 1970, but by 1990 prototypes were already implanted in humans. One of the things that these researchers were able to do with Brain-Computer interfaces was to restore vision to a man who had non-congenital blindness[4]. With a system where the user is so reliant on the technology, a security flaw would be significantly more dangerous. If a cracker decided to break into these systems they would be able to make these people see anything they like.

Another issue is with zero-day attacks. These attacks occur when a security vulnerability is discovered and the developers are not given sufficient time to work on them. For example stuxnet[11] was able to exploit four zero-day attacks to destroy approximately one-fifth of Iran's nuclear centrifuges. If Cybernetic Organisms become a norm in our society, they would be just as vulnerable to zero-day attacks as modern technology. All a cracker would need would be a single vulnerable system for them to exploit. If a terrorist needed somebody to help perform their terrorism then they would probably find it easier to crack into a vulnerable cybernetic body and use it as a puppet. Or a thief could hide their identity by using someone else to do their bidding, which would

be much more convenient to perform a robbery than doing it themselves.

With these technologies being so closely tied to our bodies and our minds it raises strong concerns for our technological securities. We should be wary of emerging technologies and the extent to which we let them connect with one another. While devices without a connection may still be vulnerable to an attack, we know from experience that connections increase the probability an attacker would be able to exploit this.

4 Class Conflict

One of the main critiques of Transhumanism is the inevitable Class divide that would be caused by the divisions in the rich and the poor. Bill McKibben an American environmentalist, argues that those with more funds would have an easier time getting technologies to enhance themselves. Because of this, the rift between the rich and the poor would continue to grow. The basis of the theory is that the initial cost of these enhancements be high, especially since they will be so difficult to manufacture in addition to being intensely invasive. This means that those without the financial stability to afford these enhancements would be left at a competitive disadvantage. Therefore, those who have these enhancements would find it very easy to continue staying ahead of those who do not have any of these enhancements.

In contrast, if there isn't the initial rift to fund further development of these technologies, there won't be a push to make it readily available for everyone. A great example of this would be the development of the electronic calculator. At its initial development, each calculator would cost about 500,000 yen (about $2500). This initial release was

only affordable for large companies, but was clearly not in the range for anybody else. However because of the initial sales of these calculators, the companies manufacturing them had the money and motivation to develop their calculators further. Soon enough, the prices, and the sizes of these calculators dropped substantially eventually reaching our current everyday calculators, cheap and affordable for even students. This same concept could apply to the concept of cybernetic organisms. They would start as expensive and bulky devices, available only to those with the privilege and money to afford them. But soon enough the prices will drop as well.

The class divide will start off as being extremely problematic. However with time and proper motivation, this divide can be overcome. This applies to all new and emerging technologies. They start expensive and unattainable but eventually find themselves being more affordable. Nonetheless this is very dependent on how motivated we are as a culture to bring these enhancements to everyone. Even today many people are still without computers and Internet access. According to the International Telecommunications Union(ITU) only about 40% of the global population have Internet access.[15]. Meanwhile in developed countries 77% of their population have access to the Internet. If this same scenario applies to cybernetic implants then it's very likely this would happen again. Developing countries having about half as much of a new technology even after 20 or so years compared to developed countries.

5 Human Paradox

As cybernetic organisms become a norm in our culture it's very plausible that we will replace more and more of our bodies with cybernetic implants. Even today there are already researchers working to place our consciousness inside of robots. When this happens, there will be the question of whether or not these people are still human beings. This is covered in depth in the ship of Theseus paradox[13]. The paradox goes as follows, starting with a brand new ship. As time passes parts of the ship are destroyed or they decay. So Theseus replaces these parts as time passes. The question is then posed, is the resulting ship still the same ship as the one they began with.

In the same train of thought, when we start with a human being, and slowly replace each part of them with a cybernetic component. At some point when there's nothing left of the original body, not even their brain are they still a human being? With a philosophical question like this the question would be better clarified to what identifies an entity as a human being. For example if the ability to act like a human was the only quantifier. Then any computer able to pass a Turing test would be called human. And according to many futurists this isn't too far off with people like and computer scientist Ray Kurzweil predicting that this will occur by 2029[14]

As well if the capability of uploading our consciousness becomes a reality then this raises a very curious situation. If this uploading process just copies our consciousness then the original would still exist. In which case it's possible that the new entity is merely a copy. This means that during this process the original body is discarded along with the person's actual consciousness. This means the goal of many futurists

who desire to have immortality through this process would really just be killing themselves. Even if this means that their consciousness would be kept alive in a Cybernetic Organism.

6 Conclusion

Cybernetic technologies is a promising new field. They're very likely to provide us with a whole new world of possibilities. Space travel would be significantly easier if say we didn't need as much oxygen as we did now. Police work would be easier if our officers were given enhanced speed and mental capabilities. These benefits will come at a cost though. They come with ethical and moral ramifications, and these issues should be examined closely before we decide to perform these enhancements on anyone. We know from our previous experiences with new world changing technologies that we can go wildly in either direction. We've seen ourselves do amazing things with technology, helping people who have done wonderful things with these technologies. But we've seen the opposite, people who take these new wonderful things and twist them for their own dark desires.

With these new technologies we should be cautious. For many the benefits of these technologies far outweigh their costs. We see this in our media with movies and television shows depicting how great the future can be. But at the same time we also have the opposite with media depicting the horrors of robots taking over the world. Cybernetics is an interesting field, and should definitely be researched and developed further. Hopefully the future will be just as promising as we perceive it to be.

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