

# Cyborg Technology: A Quiet Revolution

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## ABSTRACT

Cyborg technology is one among the new scientific achievements takes humankind to next level. Cyborgs are machine that has inner metallic endoskeleton and outer living tissue. The history of cyborg technology dates back to 1960.<sup>1</sup> Two NASA scientists named Nathan Kline and Manfred Clynes were the first to coin the term Cyborg.<sup>2</sup> Their vision is to enhance mankind survival in an extraterrestrial environment. Cyborg has been divided into two types such as convenient cyborg and conditional cyborg.<sup>2</sup> The main difference between the cyborg and robot is, a cyborg is a part of living beings but robot is a nonliving automated machine. The incorporation of cyborg technology in humans includes hearing color, the luke arm, visualizing light, hand gripping and artificial eyes. Example of such technology was first witnessed in the movie Star Wars and currently it is used as a prosthetic for humans in order to create the touch sense and to help in their normal day-to-day life.<sup>3</sup> Scope in cyborg technological development such as computer-controlled smart limbs, nanomedicine, uploading the brain and invisibility technology.<sup>4</sup> It has both advantages and disadvantages but hope in future this will bring a quiet revolution in technology advancement and upgrade human to next level.<sup>5</sup>

**Keywords:** Cyborg, Human, Science and technology.

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## INTRODUCTION

Science and technological advancement has made humankind into next level. One among the new scientific achievements is the cyborg technology. The word cyborg stands as a combination of cybernetics and organism.<sup>6</sup> In the year 1960, the name cyborg was given by Manfred Clynes. He is the one who identified the importance of artificially enhanced biological functions for human being.<sup>1</sup> These cyborgs are portrayed as half-man and half-machine beings that are both robotic and bionic implants.<sup>6</sup>

Cyborgs are machine that has inner metallic endoskeleton and outer living tissue. A cyborg is a human being who is physically in connection with the technology.<sup>7</sup> Neil Harbisson is a blind artist who visualizes the world by means of an electronic implant in his head.<sup>8</sup> This technology increases the strength and sensation which enables people to overcome disability.<sup>7</sup> Cyborg technology helps in replacement of missing limbs, injured organs, and decreased sense.<sup>3</sup>

## HISTORY OF CYBORG

The history of cyborg technology dates back to 1960. Two NASA scientists named Nathan Kline and Manfred Clynes were the first to coin the term cyborg. Their vision is to enhance mankind survival in an extraterrestrial environment.<sup>2</sup> The world's first international organization was launched in 2010 as Cyborg Foundation in order to help humans change over to cyborgs. In the year 1908, Jean de La Hire announced the novel *L'Homme qui peut vivre dans l'eau* (the man who can live in the water).<sup>9</sup>

## Cyborg Foundation

People around the world show more interest towards becoming cyborg. That initiated Neil Harbisson and Moon Ribas to start the Cyborg Foundation.<sup>5</sup> The vision of the foundation is to improve

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human senses and abilities by means of cybernetic extension to the body. This foundation was awarded Cre@tic Award by Technocampus Mataro in the year of 2010.<sup>5</sup>

## MEANING

Cyborg is a combined model between human and machine that differs from a robot. It was aimed at overcoming and recovering from physical and mental constraints.<sup>10</sup>

## TYPES OF CYBORG

Cyborg has been divided into two types:

- Convenient cyborg
- Conditional cyborg

## Convenient Cyborg

This type is used as per the human conveniences for their fancy needed. Here human can alter their body parts according to their wish by provision of exoskeleton.<sup>2</sup>

## Conditional Cyborg

This aims at the replacement of any designed or injured body parts with bionic implants that revert back to the normal functional life of human being.<sup>2</sup>

## DIFFERENCE BETWEEN CYBORG AND ROBOT

<i>Cyborg</i>	<i>Robot</i>
<ul style="list-style-type: none"> <li>A cyborg is a combination of machine and organism. It is a part of living beings.<sup>1</sup></li> <li>It is significantly complicated one.<sup>11</sup></li> <li>Cyborgs are not only applied to human being, but also to other living organisms such as animals and birds.<sup>12</sup></li> <li>Cyborgs are half-mechanical and half-biological.<sup>1</sup></li> </ul>	<ul style="list-style-type: none"> <li>A robot is a nonliving automated machine.</li> <li>Robots can be both complex and simple.<sup>11</sup></li> <li>A robot is an automated machine that has advanced technologies which require minimal human interactions.<sup>12</sup></li> <li>A robot need not replicate the human beings.<sup>1</sup></li> </ul>

## INCORPORATING HUMAN IN CYBORG TECHNOLOGY

### Hearing Color

Neil Harbisson was born color-blind; later, in 2004, he implanted an electronic antenna in the back of his skull that changes frequencies of light into vibration. This vibration was recognized as sound by brain paving the way for him to hear color.<sup>3</sup>

### Luke Arm

This was first seen in the movie Star Wars. Presently, it is used as a prosthetic for humans in order to create the touch sense and to help in their normal day-to-day life. The technology used here will receive electronic sensation signals from muscles and convert it into physical movement.<sup>13</sup>

### Visualizing Light

Jan's Neumann was blind at the age of 20; later, he was given an opportunity to use this cyborg technology. A television camera is attached to his brain channeling the damaged eyes which allowed him to watch Christmas light that year.<sup>14</sup>

Neil Harbisson is a blind artist who visualizes the world by means of an electronic implant in his head. This technology increases the strength and sensation which enables people to overcome disability. Cyborg technology helps in the replacement of missing limbs, injured organs, and decreased sense.

Zac Vawter met up with an accident and lost his leg. This technology paved the way for him to first use a mind-controlled bionic leg which translates brain signals into movement.<sup>13</sup>

### Hand Gripping

The Bebionic Company first introduced an intricate prosthetic hand design in 2017. This technology used specialized motor function that controls joint and digit independently. It has 14 pre-programmed grip functions which can hold an egg and manage up to 99 pounds of weight.<sup>3</sup>

## Artificial Eyes

Rob Spence, a film director, used an artificial eye to his missing right eye which has a wirelessly transmitting video camera. It has a video recording capacity of up to 30 minutes with full battery (Fig. 1).<sup>9</sup>

## SCOPE IN CYBORG TECHNOLOGICAL DEVELOPMENT

### Neural Implants

It will be a dream come true if we connect our mind with computer, but the technological advancement makes it reality.<sup>15</sup> Today's neural implants are cochlear implants to retain hearing and retinal implants to repair failing vision. These basic neural implants have advanced features and functions.<sup>4</sup>

### Computer-controlled Smart Limbs

Touch Bionics, a prosthetic tech company, has launched a hand which was controlled by a smartphone app. Not everyone considers adding a limb. Many believe in improving our own limbs with smart, computer-controlled prosthetics in near future.<sup>8</sup>

Current prosthetics are of tremendous help to those who have lost limbs, and these prosthetics are getting smarter every day. For example, "Touch Bionics" I-limb, prosthetic hand has a characteristics of rotating thumb, five individual potential fingers, a rotatable wrist, and aluminum chassis.<sup>9</sup>

### Nanomedicine

Nanotechnology, a medical miracle, delivers tiny "smart" particles wherever needed in the body. One experimental lung cancer treatment has the patient inhale nanoparticles by aerosol; the particles settle in diseased areas of the lungs. An external magnet superheats the particles, which kills diseased cells.<sup>4</sup>

### Uploading the Brain

Ray Kurzweil believes that by 2040 to 2045, any human will be able to upload his or her consciousness into a computer.<sup>15</sup> One Russian billionaire has revealed that he plans to process his own brain, that becoming immortal, no later than the year of 2045.<sup>10</sup> Dmitry Itskov, 32, believes that cyborg technology will let him live lasting for unknown in a hologram body. Using the neural interface, human beings can able to operate various bodies from distance.<sup>16</sup>

### Invisibility Technology

Technology experts say a real-life *Harry Potter* invisibility cloak is arriving soon. Though it is apart from optimal operation, the researchers have been working already on invisibility cloaks. Most recently, engineers have encircled an object with small antennas that collectively radiated an EM field, cancelling out visible light waves.<sup>14</sup>

## ADVANTAGES OF CYBORG

- It extends the duration of life.
- It can help lead normal human life.<sup>5</sup>
- The quality of life has improved.
- It can be useful for various professions.
- The cyborg can do the human daily routine work.
- Cyborg can give artificial parts of human body.<sup>17</sup>



Figs 1A to E: Prosthetic hand grip

## DISADVANTAGES OF CYBORG

- More training is needed.
- It is more expensive.
- Psychological problems may occur.
- They have their physical limitations.
- It does not heal body damages in normal way.
- It always requires proper maintenance.<sup>18</sup>

## CONCLUSION

An astonishing amount of cybernetic technology already exists to help people with disabilities and to improve the basic functions of their bodies.<sup>19</sup> While these tools are reserved for those with amputations or other disabilities, it does seem that commercially available bionic enhancements are not that far away. We can be on the lookout for options that could enhance our human experience.<sup>1</sup>

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