Cyber Tech

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Abstract— The term Cybe tech refers to a "cybernetic organism", which characterizes the combination of a living organism and a machine parts. The Cyborg works as a both inputs from the living sense and from the machine interface, which acts as a enhancement module. the clear difference between the human and the computerized technology in human-cyber interaction, which differs from cybe acts out of human function. Webriefly summarize this journal how exactly the cyborg is activated and the future aspects and prospects?. In which I should explains here,cyborgs generation of the society and what happens when a man get merged with a computer? But now let us understand what cyborgs are all about?

Key words: Bioelectronics, Cyborg technology, Human Nervous System

I. INTRODUCTION

Now a days, we will know machines more powerful than the humans. This mean that Robots, not Humans make all the important decisions. It will be a robot dominated desperate importance for human kind. In cyborg is the combination of the biomaterials and bioelectronics. Human have limited capabilities. human sense the world is the restricted way, vision being the best of the sense.

Human having lot of drawbacks, because human have destroyed his body parts in accident or some natural disorders. At the time we can using the cyborg technology, to using the damaged parts to be managed with help of the medical surgerical methods to fetch the latest technologies to constructed with the superhuman or artificial with the same human having fuctions with the damaged parts to working in the same activies with the help of machines.

Today many fields are using the cyborg technologies like medical,engineering,military.finance,etc.in cyborgs have great approach with these above technical fields.3 different cyborgs are using in the cyborg technologiy are individual,animal,social cyborgs.we made this cyborg using the development of implantable devicesin particular, biocompatible materials, brain-machine interface, flexible electronics, implants, robotics.But now let us understand what cyborgs are all about?

A. The cyborg origins

The concept of a man-machine mixture was widespread in science fiction before World War II. As early as 1843, Edgar Allan Poe described a man with extensive prostheses in the short story "The Man That Was Used Up". In 1908, Jean de la Hire introduced first true superhero was also the first literary cyborg in the novel L'Homme Qui Peut Vivre Dans L'eau (The Man Who Can Live in the Water). Edmond Hamilton presented space explorers with a mixture of organic and machine parts in his novel The Comet Doom in 1928. He later featured the talking, living brain of an old scientist, Simon Wright, floating around in a transparent case, in all the adventures of his famous hero, Captain Future.

The world's first cyborg was a white lab rat, part of an experimental program at New York's Rockland State Hospital in the late 1950s. The rat had implanted in its body a tiny osmotic pump that injected precisely controlled doses of chemicals, altering several of its physiological parameters. It was part animal and another half part of machine.The Rockland rat is one of the stars of a paper called "*Cyborgs and Space*," written by Manfred Clynes and Nathan Kline in 1960. This engineer or psychiatrist double act invented the term "*cyborg* "is to describe the vision of an "augmented man".

From the start, the cyborg was more than just another technical project; it was a kind of scientific and military daydream.The moving generation of the human knows the superpower of the cyborg. By the mid-1960s, cyborgs were big business, with millions of US Air Force dollars finding their way into projects to build the way for dominating the human life with the Robot Arms. It wasn't only the military that was captivated by the possibilities of the cyborg. Now there was the possibility of making better humans by augmenting them with artificial devices.

The following examples for the certain year using cyborg technologies, the Insulin drips had been used to regulate the metabolisms of diabetics since the 1920s. A heart-lung machine was used to control the blood circulation of an 18-year-old girl during an operation in 1953. A 43-year-old man received the first heart pacemaker implant in 1958.

B. Cyborg and human

When a character acts human and looks human, displays emotion, has fallibilities as well as strengths, the audience empathizes with that person. The audience seems to consider human anyone who reminds them of themselves. The nemeses in the movies mentioned are often dispassionate and calculating. Whether human or not, they evoke the qualities associated with machines. Since the audience cannot empathize, the character and their evil qualities are justified. The main criteria for being considered human, then, seems to be how much a character appears to be like other people or how well they express qualities associated through history, culture, and literature to be human.

Cyborgsare most often defined based on their physical characteristics. They are part cybernetic and part organism. Arguments for the current existence of many cyborgs are based on looking at physical prostheticthat people use. In science, humans are also defined by their physical features. Humans are a species of mammal, biped Homo sapiens with enlarged fore-brains. But as the movies show, what the audience comes to consider human does not necessarily correlate with the character's birth by another human.

The movies dealing with cyborgs and humans create an idea of humanity based on actions and emotions rather than physical characteristics. However, the idea of

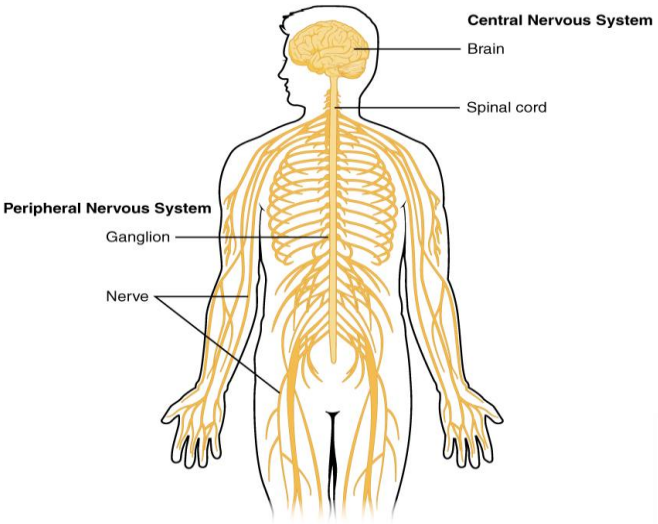
cyborg is still based primarily on physical description before action. I propose that these categories do not have to be mutually exclusive because they deal with different methods of defining a character or even a living person. There is no need to set human vs. cyborg in opposition when human is a behavior and cyborg is a feature.

C. Analogy with the Human Nervous System

The nervous system derives its name from nerves, which are cylindrical bundles of fibers which means axons of neurons, that emanate from the brain and central cord, and branch repeatedly to innervate every part of the body.

1) How is the human nervous system organized?

a) The human nervous system contains:



2) A Central Nervous System (CNS)

where information is processed. Our central nervous system consists of the brain and the spinal cord.

3) A Peripheral Nervous System (PNS)

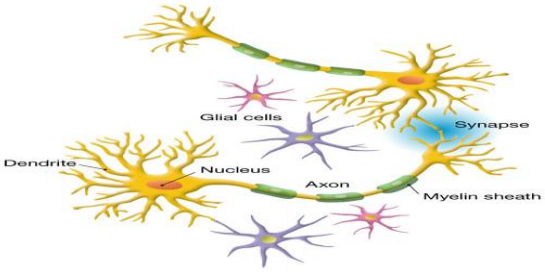
A highway which allows signals to travel between the CNS and the body's receptors and effectors.

Now,we have to explain the way in whichthe **CNS** operates. What we should know is that, it acts as a Central Processing Unit (**CPU**), and so processes all the inputs it receives from the **PNS**, which are known as ***stimuli***and translates them into the Outgoing signals for the PNS, also known as ***response***. Thus, for every Stimulus there is a corresponding Response.

The nervous system is the part of an animal's body that coordinates its voluntary and involuntary actions and transmits signals between different parts of its body. Nervous tissue first arose in wormlike organisms about 550 to 600 million years ago. In most animal species it consists of two main parts, the central nervous system (CNS) and the peripheral nervous system (PNS).

The nervous system contains two main categories or types of cells:

- Neuron
- Glial cells



Neurons can be distinguished from other cells in a number of ways, but their most fundamental property is that they communicate with other cells via synapses, which are membrane-to-membrane junctions containing molecular machinery that allows rapid transmission of signals, either electrical or chemical.

Glial cells are non-neuronal cells that provide support and nutrition,and participate in signal transmission in the nervous system.In the human brain the most important functions of glial cells are to support neurons and hold them in place.

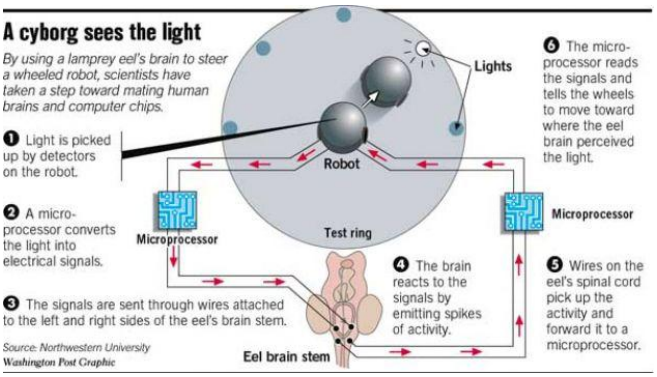
The CNS contains the brain and spinal cord. The PNS consists mainly of **nerves**, which are enclosed bundles of the long fibers or **axons**, that connect the CNS to every other part of the body.These Nerve Impulses travel along the Nerve Fiber and thus reach their destination electrically.

Since the Nerve Conduction is in the form of Electrical Signals, this opens up a possibility of intercepting, interpreting and processing them with the help of Machine Interfaces. As the Machines can process all kind of electrical signals, so we can have a Microchip Implant intercepting the Neural Impulses at the nerve endings, transmitting them to a Database, correlating them to existing data and modulating it to a desired effect.

D. Robo-eels, critters on chips lead cyborg

The cyborg eel is only one member of a menagerie of animal or machine hybrids that relies on sophisticated microelectronics. Melding animals and automatons, researchers have concocted a growing number of bizarre cyborgs that could transform science and perhaps the human species itself. But critics contend that such meddling could lead to consequences that do more harm than good.

On May 8th 2001, in Chicago researchers have fused the brain of a primitive lamprey eel with a robot the size of a hockey puck, creating a living machine that tracks a beam of light in a laboratory ring, like a miniature bull chasing a matador's red cape.

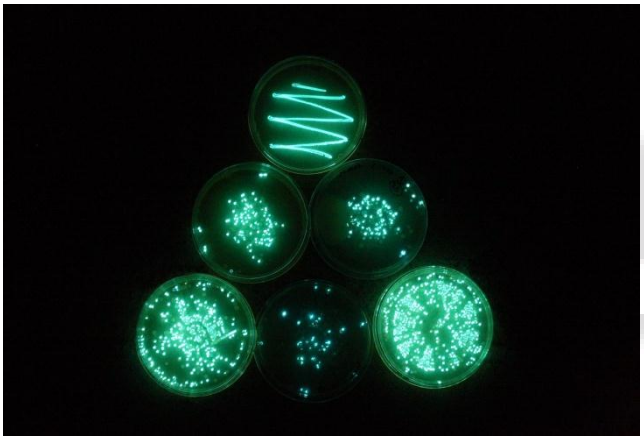


Part biological and part mechanical, the crude cyborg is equipped the brain stem of an eel, which, kept alive in a saline solution, receives input from electronic light sensors and directs the robotic wheels to move toward the source of the beam.

Changing the location and intensity of the light, the scientists noticed that the eel brain could adapt to changing conditions in its effort to locate the source.

E. Prosthetic limbs, glowing bacteria

The Northwestern University researchers hope to unlock the mysteries of the animal's nervous system. "We are focused on the use of this instrument as a tool to understand the processing of information by a group of brain cells,"said Ferdinando Mussa-Ivaldi, one of the primary researchers.The scientists are focusing on a structure located between the spinal cord and higher brain centers that is believed to integrate information from different origins,Induced to glow on an integrated circuit, these bacteria cells generated all the light necessary for this long-exposure,to shape the commands that control muscle movement, Mussa-Ivaldi said. The research eventually could help doctors fashion sophisticated artificial limbs for those suffering from nerve damage, he said.



The cyborg eel is only one member of a menagerie of animal or machine hybrids.In the United States, monkey brains have been wired to control robotic appendages, moth antennae have been used to sniff out explosives, and bacteria have been engineered to glow in the presence of environmental toxins.

The hybrid includes genetic material from a microorganism and other bacteria that breaks down pollutants into simpler, safer compounds. Affixed to microcircuits with latex and other polymers, the so-called "critters on a chip" eat harmful toxins, emit a blue-green light, and then can transmit a signal to a receiver linked to a remote computer.

The living sensors could someday be used to monitor industrial pollutants in the water and soil and even help diagnose medical conditions in humans.

F. Inside the Human Cyborg

Scientists have long known that the body's nervous system uses electrical signals. Now they're implanting devices in humans that communicate directly with nerves in a language they understand.

In below I would explains,how the human get constructed with a cyborg?.There are two parts, I should explain the human body can designed for the cyborg.

- UPPER PART(Head)
- LOWER PART(Below Head)

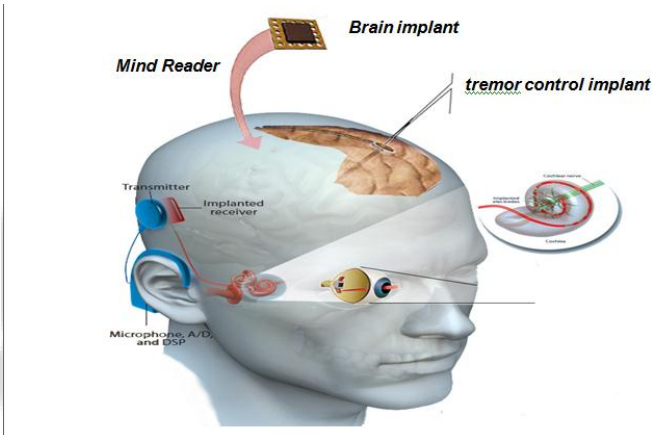
G. Upper Part (Head)

1) Brain Implant

is an experimental technology would place tiny circuit boards deep in the brain which give off electrical signals mimicking natural brain function. They could be used to correct localized brain and spinal cord damage, and could someday be used in healthy brains to improve functions such as the recall of memories.**Status:** Researchers expect tests in humans within 15 years.

2) Mind Reader

is the researchers have created rudimentary thought-controlled switches. Sensors placed on the skin monitor brain waves; the user can make a yes or no choice by altering their mood, such as by thinking of something happy or sad



Cochlear ear implant

3) Tremor controlimplantis

a pulse generator implanted in the shoulder (not shown) regularly electrify a probe that touches a structure deep in the brain. The pulses interrupt the brain signals that cause tremors in many sufferers of Parkinson's disease and other illnesses. Cost: $25,000 including surgery Status: Approved by the FDA for use in the U.S.

4) Cochlear ear implant

is the person can get Unlike hearing aids, which simply amplify sound, cochlear implants stimulate nerves in the ear, helping some deaf people hear. The implant analyzes sounds by volume and pitch and stimulates ear nerves accordingly. The noise heard by the user is not like normal sound, but with training, speech can be understood. A microphone and sound processor outside the skin transmits signals to an implant wired in-side the inner ear. **Cost:** $25,000 to $35,000, including surgery and training **Status:** About 1,000 people receive implants each year.

5) Retinal implant

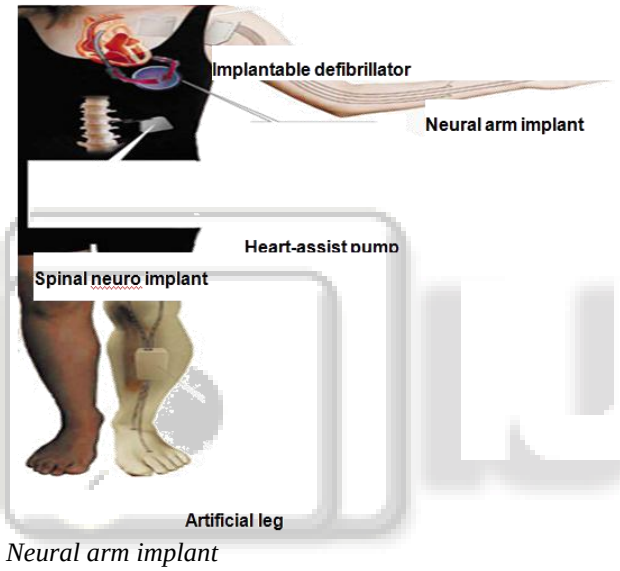
is to use a Tiny microchips, implanted in the eye, could provide a crude form of vision for people made blind by diseases of the A small video camera on the user's glasses transmits a coded image into the eye-ball via a laser, where a microchip implant receives the information. Inside the eye,

the implant translates the laser's data and activates a grid of electrodes which directly stimulate the nerves in the eye, creating dots of light and dark the implant's microchip, 2 mm square, contains electronics as complex as those in a color TV print may become readable, but color and detail are still lost. **Cost:** $13-18,000 including surgery. **Status:** Approved in mid-July by the FDA for use in the U.S.

H. Lower Part (Below Head)

1) Implantable defibrillator

Pacemakers, implanted in the shoulder or chest, monitor the heart and correct abnormally slow and fast heartbeats with small pulses of electricity. If the heart rate becomes dangerously fast, the device automatically jolts the heart with high-energy shocks like the paddles used by paramedics and in hospitals. The implants can track and relay heart information to doctors and can be reprogrammed after they've been implanted. **Cost:** $35,000-$45,000 including surgery. **Status:** approved by FDA for use in U.S



2) Neural arm implant

is the people with weak or paralyzed arms and hands, an network of electrodes implanted under the skin can activate certain muscles and restore gripping and lifting abilities. A controller (not shown) is placed in a movable part of the body. It responds to small movements and signals electrodes to activate arm and hand muscles. For instance, the user might move their shoulder upward to make their hand grip an object and move the shoulder down to release it.Eventually, implanted pressure and temperature sensors will relay information to electrodes in another part of the body. The user could 'feel' the object in their hand, though the sensation would be somewhere else, such as their shoulder or upper arm. Cost: $45-60,000 for a partly implanted, partly external system. Fully implantable systems are being tested. Status: More than 70 users.

3) Heart assist pump

is instead of transplanting a heart or installing an artificial heart, a pump implanted in the chest can take over for a weak or damaged heart. Unlike artificial hearts, which must beat at a fixed rate, a heart-assist pump speeds up and slows down with the natural heart's pumping, allowing the user more freedom to exercise. **Cost:** $100,000 including surgery **Status:** Available in the U.S.; more than 1,000 users.

4) Spinal neuro implant

is mostly used to alleviate chronic pain, an implanted device sends signals to an electrode attached to the spine, blocking pain signals from reaching the brain. The device can be customized to work on different parts of the body and can be operated with a hand-held remote control. **Cost:** $50,000 including surgery. **Status:** Available since more than a decade Thousands.

5) Artificial leg with feedback

is a prosthetic devices can be equipped with pressure and temperature sensors. The sensors activate electrodes on the residual limb, where the user can feel what the prosthetic is sensing. Used in artificial legs, they help the user keep their balance and prevent injury. Status: Models expected within a year

I. What's next???

The most logical query that strikes the mind is what is the future? With all the developents in the field of Robotics and Human Technology integration, some exciting facets to look out for are:-

1) In finance

Due to advances in Information Technology, human investors are able to employ super computers to engage in financial activities such as working at faster speeds across borders than ever before. Because of the increasing reliance on artificial intelligence and advanced computerization, modern finance is becoming "cyborg finance," because the key players are part human and part machine.The new cyborg investor is distinct from past conceptions of investors because this new investor conception is faster, more data driven, automated, and less human.One key characteristic of cyborg finance is the use of incredibly powerful and fast computers to analyze and execute trading opportunities based on complex mathematical models.

2) In medicine

In medicine, there are two important and different types of cyborgs: the restorative and the enhanced. Restorative technologies "restore lost function, organs, and limbs".The key aspect of restorative cyborgization is the repair of broken or missing processes to revert to a healthy or average level of function. There is no enhancement to the original faculties and processes that were lost.

A brain-computer interface, or BCI, provides a direct path of communication from the brain to an external device, effectively creating a cyborg. Research of Invasive BCIs, which utilize electrodes implanted directly into the grey matter of the brain, has focused on restoring damaged eyesight in the blind and providing functionality to paralyzed people, most notably those with severe cases, such as Locked-In syndrome. This technology could enable people who are missing a limb or are in a wheelchair the power to control the devices that aide them through neural signals sent from the brain implants directly to computers or the devices. It is possible that this technology will also eventually be used with healthy people.

Retinal implants are another form of cyborgization in medicine. The theory behind retinal stimulation to restore vision to people suffering from retinitis pigmentosa and vision loss due to aging the conditions in which people have an abnormally low amount of ganglion cells is that the retinal implant and electrical stimulation would act as a

substitute for the missing ganglion cells cells which connect the eye to the brain.

An August 26, 2012 article from Harvard University's homepage, by Peter Reuell of the Harvard Gazette, proceeds to discuss three-dimensional cyborg tissue research, published in the journal Nature Materials, with possible medical implications done by Charles M. Lieber, the Mark Hyman Jr. Professor of Chemistry, and Daniel Kohane, a Harvard Medical SchoolAnesthesiology Professor at Boston Children's Hospital.

3) In the military

Military organizations' research has recently focused on the utilisation of cyborg animals for the purposes of a supposed tactical advantage. DARPA has announced its interest in developing "cyborg insects" to transmit data from sensors implanted into the insect during the pupal stage. The insect's motion would be controlled from a Micro-Electro-Mechanical System (MEMS) and could conceivably survey an environment or detect explosives and gas.

The use of neural implants has recently been attempted, with success, on roaches. Surgically applied electrodes were put on the insect, which were remotely controlled by a human. The results, although sometimes different, basically showed that the roach could be controlled by the impulses it received through the electrodes. DARPA is now funding this research because of its obvious beneficial applications to the military and other area.

In 2009 at the Institute of Electrical and Electronics Engineers (IEEE) Micro-electronic mechanical systems (MEMS) conference in Italy, researchers demonstrated the first "wireless" flying-beetle cyborg. Engineers at the University of California at Berkeley have pioneered the design of a "remote controlled beetle", funded by the DARPA HI-MEMS Program.

Eventually researchers plan to develop HI-MEMS for dragonflies, bees, rats and pigeons. For the HI-MEMS cybernetic bug to be considered a success, it must fly 100 metres (330 ft) from a starting point, guided via computer into a controlled landing within 5 metres (16 ft) of a specific end point. Once landed, the cybernetic bug must remain in place.

4) Superman

Imagine having infinite memory, and being able to recall it at your wish. This is possible with the implants; all the experiences of an individual, even those which he has not experienced himself may be stored in computer memories. Whenever he requires them they can be sorted and replayed to him, through the implant. And then there will be the added processing ability, you could perform a zillion operations on your own, so what if all the Computers at the NASA assist you in your quest. The results would come from your brain.

5) Security

With implants in place, it would be possible to identify every individual, with foolproof security. There won't be any need for the SMART cards, credit cards and all other ID's that one has to carry. Cars would start only if authorized personnel approached it, in case some other individual tried to get away with it, the car would be able to identify the culprit, and send his ID to the nearest Police Station or Personnel. Bank Accounts would be handled in the same manner, no need for signatures; your presence would do whatever it takes.

6) And More…

There are plenty of other applications that cannot be covered in a particular heading. We can have audio files playing directly into our brain, eliminating the need of Players. Movies can be screened directly into the optical nerves. Move aside SMS, we can have TMS, standing for Thought Message Service. Want to drive your car, just think of the way it has to navigate and zip through. Need to order items for that Party, just wish and Cybernetics will make them its command. Want to know, what is the nature of Philosophy of Objectivism, your implant will connect to the Internet and download all it has to your mind, who cares for Ayn Rand then. f of Objectivismip through. Need to order items for that Party, just wish and Cybernetics will make them its comand.All so hassle free, without any wiry mess or bulk of instruments. With the Implant even Sky won't be the Limit.

7) Challenges Ahead

But with so many pros there are bound to be some cons, and yes there are a few problems that bug us.

- Noise and Distortion:
  The basic trouble is that the signals on the nervous system are very low in magnitude and so are easily affected by stray signals. Keeping the noise out of the system is a very big challenge.
- Misinterpretation:
  The nerve signals of one individual could be interpreted in a different way by other individual's brain, as the way of he correlates information may differ.

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