

# Brain Chip : Controlling The Human Body With A Nano Chip

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**Abstract** - In this era of modern science, the evolving technology has proven itself efficient in tackling the day-to-day problems. The continuous technological upgrades help man solve issue and problems. The biggest challenge faced by humans is the incurable deceases and disabilities. Information is the key to solve any problem. Over the period man has gathered a lot of information which is impossible for him to study and store everything in the brain. Not only every hour but every minute a large chunk of data is being generated. Improving technology requires and produces a large amount of statistical data. The quantity of statistics that is produced can be produced in minutes today which is not enough. In the next 10 years it can be generated in seconds or less. The time required will definitely reduce for each upcoming era. A man cannot study and digest all the produced facts and information for which an additional help would be need in the form of a device or a technology. This void will be filled by the brain chips which will be micro brain itself with the abilities of a computer. It will basically collect the virtual statistics and remodel them into useful records, as human brain functions. Human need good enough Brain Chips are going to be extremely important as everything is becoming digital. As the world nowadays is progressing closer to this used information is a result of the quick progression in the direction of digital practices of the world, inclusive of on-line transaction, social media and having access to internet, downloading facts, importing facts. The attitude of digitizing everything has catalyzed the urge for man to process a large chunk information, data and facts in him. This kind of motivation has led us into the hunt of a perfect system that can analyze anything and provide information and solution instantly with utmost accuracy. This hunt has brought us to the brain chip interface with the intention to enhance the cognitive potential and ability of brain to store data. Brain chips can used in treating biological and physical issues caused by neurological illnesses like paralysis, stroke, epilepsy, etc. Brain chips will can be used as an aid to the prosthetic limbs which will ease the patient's life by helping him to conduct day to day activities It's also useful for in army to counter terrorism. Innovation of this advanced technology has unfolded opportunities for man to achieve higher goals and reach new heights.

**Key Words:** Brain Chips, Neurological, Prosthetic, Neural Network.

## 1.INTRODUCTION

The pace of generation and transmission of statistical data has improved by means of multiples of tens of millions. The time required for making the right decision for a given

situation is reducing which in turn is resulting in making the decisions without any technological support difficult. As human beings are advancing in time, they need technological revolution. It's time to discover new mankind's revolutionary desires in inner most social transformation. Wasting assets and time on solving non-permanent problems is less efficient. Instead putting major efforts, assets and time on technology will lead mankind to a better future full of energy, health and development. This can be achieved by enhancing man's cognitive capacity with chips implants in the brain. Brain chips interface is a large set of interconnections in which the chip and the nerve cells of our brain interact with each other to switch electrical signals from brain to computer or vice versa through a small chip. In simple terms the computer would be able understand what the brain cells want to say by using a chip. As it is supposed to be a two-way communique, the brain would also be able to understand what the computer is saying. We would be able to instruct the brain to carry out tasks where as we would be able to access the computer without having a physical machine. Machines that act like human brain seems like technology fiction. It's more like fusion of neuroscience and engineering. Brain chips are built by using the nano technology concept which ambitions at changing an individual into superhuman with mutated abilities. It has excellent packages in the discipline of neuro technological know-how engineering and pace reputation. It is one of the greatest innovations of mankind. The more the studies, the more will be the upgrades. Now a days a lot of people suffer from neurological disorders which can prove to be lethal for the victim. Billions of people are afflicted by neurological issues all over the world which results in millions of deaths each year. After so many years of research and analysis many scientists have considered that the Brain Chips Interface technology (BCI) can play a vital role in addressing and treating these neurological issues. Brain chips interface can be implanted in the brain as its functional part which will mimic all the features, interactions and responses of brain. It can record all the signals and document it and later deliver it to the computers. This study further can be utilized by patients to restore the misplaced management of movements of body because of neurological damage caused to the brain or the paralyzed body part. If used this hybrid technology properly and efficiently then it can lead mankind towards a better and brighter tomorrow. But can also lead the world towards total disaster if misused. We could hope it brings peace to our

world and authorities grant permission to the people to get their brain implanted with brain chips who actually are in need.

**2.ELECTROENCEPHALOGRAPHY (EEG):**

EEG machine is a device which records each and every activity of brain through the electrical signals sent by nerve cells of brain. They record every single pattern and image of neural connections and signals and sends back to the computer via chip. Each electric signal has a different electrical signal in neural networks of brain making unique patterns for each activity a human brain does. If a patient responds to a question with yes then there will be different pattern and if a patient answers no then the computer will receive a different pattern. Each activity is recorded and the brain signals are converted into digital data and later sent to the computer. EEG is responsible to convert the electrical signals of the brain nerve cells to digital data and vice versa. Researchers have invented an EEG cap which records human brain functional signals.

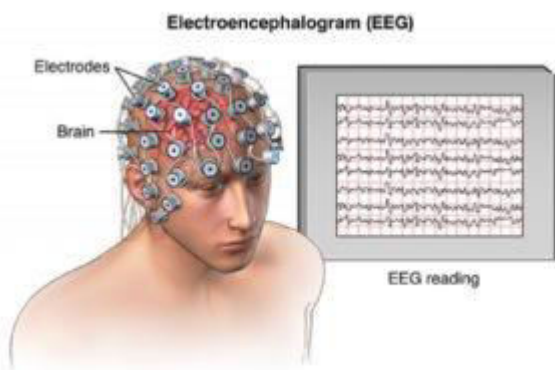


Fig – 1: EEG mechanism

**3.NEURAL NETWORK WITH BRAIN CHIP :**

To know about brain researchers first learnt about how neurons are structured and why does brain require neurons and a lot of neural networks. Brain has different section for different activities we do. The functions of the brain are carried out by the neural networks. The neural networks collect all the information from every individual body cell with the help of Nerve cell. The nerve cell and the body cell connect each other forming a neural network in brain to process the activities a man does. The neural network is linked with brain chips electrically. The electrode sensors of the brain chips are used to record each and every signal sent by the brain. We can culture brain cells directly upon the chip and they grow on chip with a tight electrical coupling. It carries out the different algorithms through different networks. To connect this network, we have synapses in the piece of brain like motor cortex, Spinal cord and sensory organs. In the space equal to the size of a hair pin there are

over 40 million synapses. These synapses then connect to 30,000 neurons. Nerve cells are messengers between the cells who control the connection algorithm. There are over 86 million neurons in a human brain.

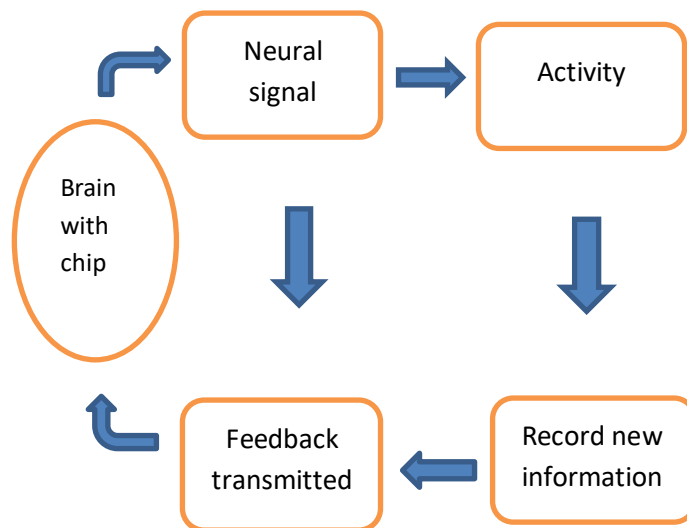


Fig -2 : Interaction of chip with outside world.

**4.EVOLUTION TOWARDS BRAIN CHIP INTERFACE :**

Brain chip implants are known as the part of modern science and technology. In the year 1929 HANS BERGER a psychiatrist invented a device called Electro Encephalography (EEG) machine. It was invented to understand how human brain reacts and what signals and patterns does brain generate while doing a particular task or responding to a question. This helped to record the human brain signals. JOSE DELGADO implanted electrodes in animal brain and attached them to a STIMOCEIVER to track the electrical signals. In the year 1998 the researcher PHILP KENNEDY implanted the first brain chip in human brain to record brain activity and the corresponding electrical signals. At Brown University in the year 2001 JOHN DONOGHUE and his team of researchers named Cyber Kinetics invented brain gate. Later in 2004 JONATHAN WOLPAW and his team of researchers at New York state invented an EEG cap for the easier installation of electrodes. Then IBM invented a wireless Brain Chip Interface which is 4mm in size. The chip has 5.4 billion plus interconnected transistors. They are capable of stimulating 1 million neurons and 256 million neural connections. The secretive research arm of department of defense DARPA is planning to implant BCI in soldiers making them more efficient by enhancing their cognitive abilities for many useful applications.

**5.BRAIN CHIP HUMAN INTERFACE ( BCHI ) :**

Using on-chip microelectromechanical systems (mems) within the biomedical discipline has won increasing interest in current years. There is continuous improvement in technologies such as micromechanics and microelectronics. Also, there is simultaneous collection of information about cell and molecular mechanisms. Due to all these factors sciences are driving development of recent generations of mems serving as scientific, diagnostic and therapeutic equipment. Microchips for multi-web site recording of neuronal interest were a few of the first to be brought. Now microchips represent an expanding era with enhanced capacity for novel applications. From its infancy, the era has gone through a revolutionary development and it's far now widely followed via neuroscientists for recording residing neurons “in vitro”. Extra currently, we've got assisted to the increasing usage of implantable microchips as neuronal probes for investigating brain circuits “in vivo” even as, in parallel, their ability for neuroprosthetics programs has been successfully confirmed in non-human primates and assessed in medical trials in paralyzed patients.

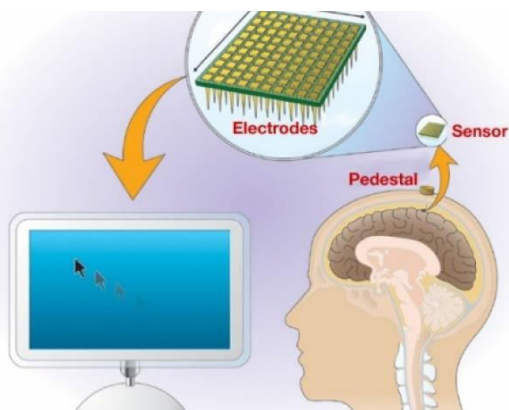


Fig -3

The multiplication of methods, examples of packages that are primarily based on chip-to-brain interaction and verbal exchange has led us to attempt the formulation of a complete definition for this magnificence of hybrid gadget and concept. Brain-chip-interfaces (BCHIs) are proposed as the time period to identify hybrid systems wherein chip-primarily based mems establish conversation pathways through near bodily interplay with brain cells, either “in vitro” or “in vivo”.

**Parts Of BCHI:**

- a. **The Pedestal with chip:** The pedestal is 2 cm in size with a 4mm micro electrode array (brain chip) is connected to it. It records all the electric pulses of the nerve cells and transfers it to signal amplifier.

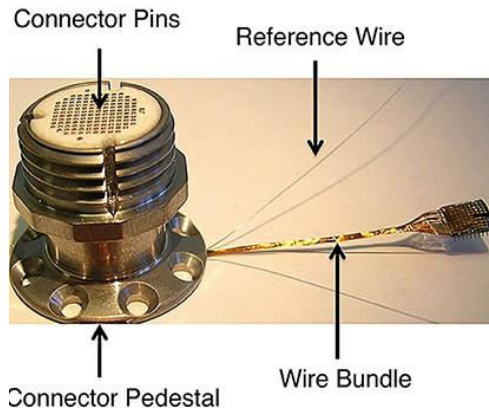


Fig -4 : Pedestal Connector

- b. **Fiber Optic Cable:** It receives the signals sent by chip and sends it to neural signal interpreter.

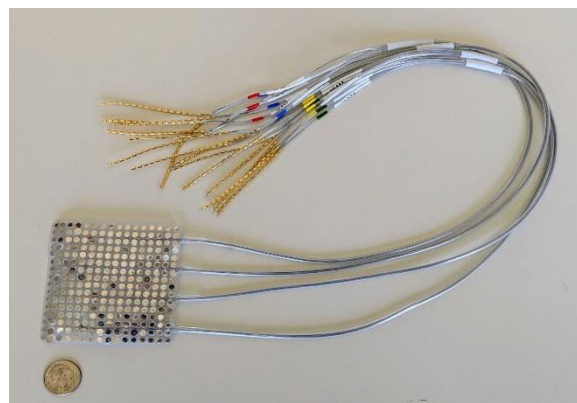


Fig -5 : FIBER OPTIC CABLE

- c. **Neural Signal Interpreter:** It converts the brain signals to digital signals and sends it to computer, it can also convert digital signals into brain signals.



Fig -6 : NEURALSIGNALINTERPRTE.

- d. **Computer:** It learns all the patterns made by the nerve cells of each particular activity that human brain does with the help of digital signals send by neural signal interpreter.

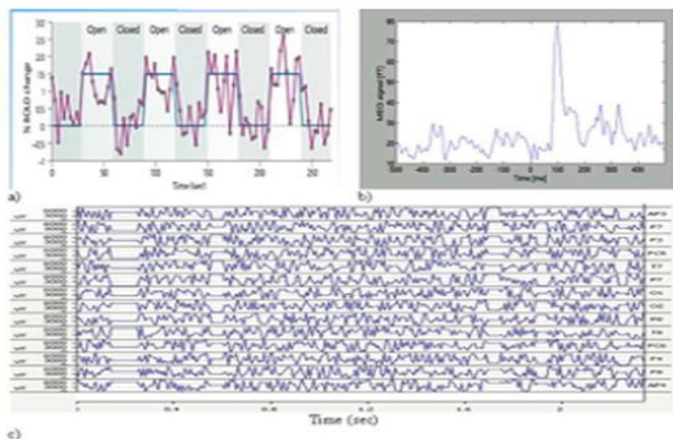


Fig – 7 : Shows the brain signals in computer

**Achievements of BCHI**

**a. Moving paralyzed body parts:**

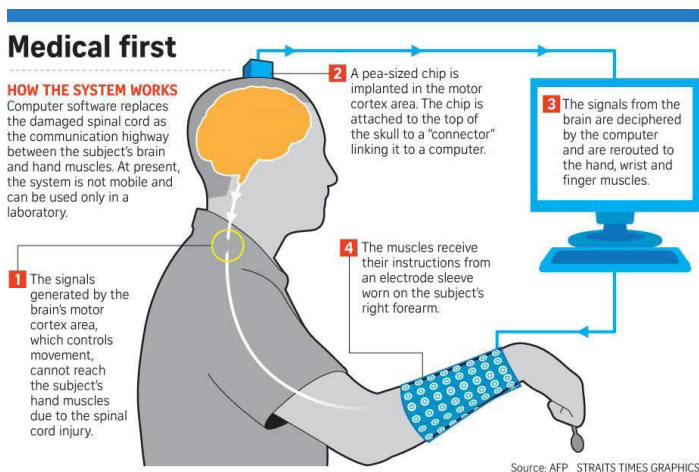


Fig -8 : Moving paralyzed a paralyzed hand

**b. Prosthetic limbs:**

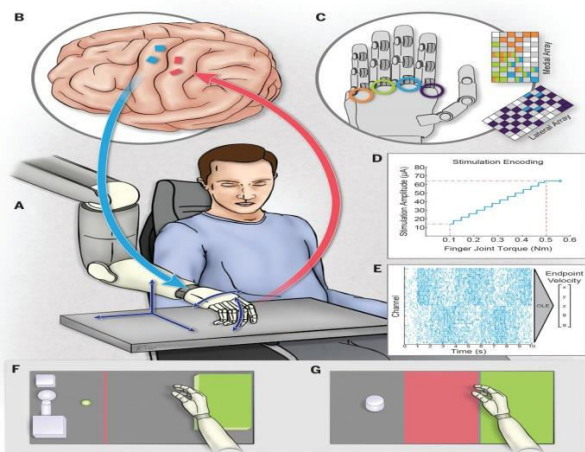


Fig -9 : Controlling prosthetic arm

**c. Super Solders:**

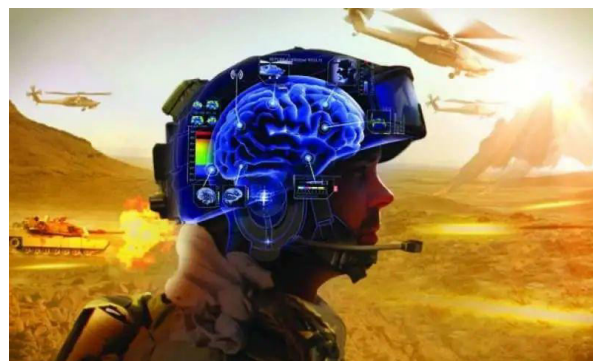


Fig – 10 : Soldier with BCHI implant

**Advantages Of BCHI:**

- ✓ BCHI performs consistently good making it a reliable.
- ✓ Human brain can adapt brain chips easily. BCHI expands the capability of human brain.
- ✓ Brain chips learn by recording all information and interactions. They can enhance memory capability to a large extent as they will be connected to computers and internet.
- ✓ Depending on the circumstances and task brain chips can be used effectively.
- ✓ Brain chips can be built or modified to meet patient's individual requirements.
- ✓ Brain chips are very effective for human brain in increasing its cognitive ability and increasing memory capacity.
- ✓ With the help of brain chips, we can prevent the problem of memory loss.

**Disadvantages Of BCHI:**

- ✓ Getting a BCHI implanted would be very expensive.
- ✓ High risk of damaging the brain or neural network during the surgery.

**6.PUBLIC OPINION ON CHIP IMPLANT :**

The easy availability of brain chips might seem like impossible or an idea from science fiction, but this scenario will not last longer. For now, brain chips or brain implants, also called neuroprosthetics, are available only for medical patients with specific conditions such as neurological disorders or patients with prosthetic devices as limbs. Cochlear implants are used by hundreds of thousands of people who are deaf or hard of hearing. Many patients who are suffering from Parkinson's disease have a device implanted in their brain to send electrical pulses to help motor control. In April 2016, a team medical researchers from The Ohio State University and Battelle Medical Institute had reported that they have helped a paralyzed patient regain his control over the movements of his right hand and fingers using a [computer chip implant in the brain](#). (For more insights on the brain implants, see "[Human Enhancement: The Scientific and Ethical Dimensions of Striving for Perfection](#).")

The Pew Research Center survey takes an early look at public opinion about using brain implants in people without a medical need for the device. People were given a brief hypothetical scenario, involving the surgical implantation of a computer chip in the brain for the purpose of giving people a much-improved ability to concentrate and process information easily. They were later asked a series of questions about this scenario to understand what people think about it.

Some people are much more likely to express concerns about implanting computer chips in human brains. They say they would be enthusiastic about such an idea. And about twice as many said that they would not want to use this technology themselves or would sign up for such an implant. Some adults are also more likely to see this type of technology as morally unacceptable, although many said that they are not sure about the moral implications. There is a large difference in views about this advanced technology among religious groups. Similar to their thoughts about gene editing, people who have high religious commitment are more likely to see such a technology as “meddling with nature.”

## 7. CONCLUSIONS

The invention of brain chip is a boon for mankind. Memory capacity of the brain would be limitless. Intellectual capability would be enhanced. Patients with neurological diseases would be able to use the affected parts as Brain chip technology involves communication based on neural activity of brain. The advantage of brain chips with nano technology will allow researchers for smaller and superior chips making it less burdensome and more reliable option for people. The amputated limbs can be restored with prosthetics and controlled easily with the help of brain chip interface. Rehabilitations for patients would become easy. It is one of the biggest revolutions in the field of engineering and neuro science. It has endless advantages which will help man to achieve greater goals.

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