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The Future Technology Brain Chip Interference

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Abstract

The technology today is highly efficient and is been upgraded everyday, . A Human can no longer read and digest these information, every individual need serious help, these essential help is in the form of algorithm. It's basically taking the digital information and transforming them into useful information, as human brain functions. Human need adequate algorithms and they need machines. One of it is deep learning, this is what GOOGLE and MICROSOFT and many such companies investing huge amount of resources and many research on to how efficient this data can be processed and stored. In every process human beings follow is progressing towards digital, hence there is a urge for humans to process this huge data in themselves and that's the reason human being requires a technology that enhances our brain to process this data and which is why there is a research done on brain chip interface which will enhance the cognitive ability of brain and can also be used in health issues such as for people who suffer from neurological diseases like paralyzed, stroke, epilepsy etc..

Keywords:

Brain-chip-interfaces (BCHIs) are hybrid entities where chips and nerve cells establish a close physical

Introduction

interaction allowing the transfer of information in one or both directions. Typical examples are represented by multi-site-recording chips interfaced to cultured neurons or implanted in the brain to record or stimulate neuronal excitation. We provide an overview on recent achievements in the field of BCHIs leading to enhancement of signals transmission from nerve cells to chip or from chip to nerve cells, either in terms of signal-to-noise ratio or of spatiotemporal resolution. Micro-nail shaped microelectrodes engulfed by neurons in culture establish a tight electrical coupling with the cells and allow for high signal-to-noise ratio recording.

Artificial Intelligence is an approach to make a computer, a robot, or a product to think how smart human think. AI is a study of how human brain think, learn, decide and work, when it tries to solve this

Speed of data transmission has increased by multiples of millions.

Time to find new mankind it is clear that today's revolution needs deepest social transformation. Instead of wasting resources on solving momentary problems it's time to focus on technology of future which finds new source and energy. The time we have to make right decisions is shorter and shorter. As humans are facing a choice to new dark age they need technological revolution.

It's like fusion of neuroscience and engineering. Brain chips are build by using NANO TECHNOLOGY which aims at converting a human being into SUPERHUMAN. It has miraculous applications in the field of neuro science engineering and speed recognition. Its been a ground breaking innovation. The more the research, the more improvements today people suffer from neurological disorders which are deadly conditions they are suffering from. About one billion lives suffer from neurological disorders in every country, which accounts to seven million deaths every year.

It has endless applications. But also can bring world towards disaster if misused. Let's hope it brings peace to world and government just permits the people who really need it.

contains little or no information about the structure of the targeted system.

Some studies proposed threat models on adversarial example(AE)s. The AEs are input data with invisible noise, in order to misclassify the input and degrade the performance of AI. They focused on impacts when malicious data is injected in training phase or in inference phase. The experiments demonstrated the performance reduction of AI system attacked by AEs such as malware detection, facial recognition, intrusion detection, etc.

Brain-chip interfacing

The use of on-chip microelectromechanical systems (MEMS) in the biomedical field has gained increasing attention in recent years. The continuous improvement of micromachining and microelectronics technologies and simultaneous deepening of knowledge about cellular and molecular mechanisms in life sciences are driving development of new generations of MEMS serving as scientific, diagnostic and therapeutic tools. Microchips for multi-site recording of neuronal activity were among the first to be introduced [1] and now represent an expanding technology [2,3] with great potential for novel applications. From its infancy, the technology has undergone a progressive development and it is now widely adopted by neuroscientists for recording living neurons "in vitro". More recently, we have assisted to the increasing usage of implantable microchips as neuronal probes for investigating brain circuits "in vivo" while, in parallel, their potential for neuroprosthetics applications has been successfully demonstrated in non-human primates [4] and assessed in clinical trials in paralyzed patients.

The multiplication of approaches and examples of applications that are based on chip-to-brain interaction and communication has led us to attempt the formulation of a comprehensive definition for this class of hybrid devices. Brain-Chip-Interfaces (BCHIs) is proposed as the term to identify hybrid systems in which chip-based MEMS establish communication pathways through close physical interaction with brain cells, either "in vitro" or "in vivo" (Figure 1). Despite the fact the most BCHIs are based on electrical signaling between neurons and microelectronics sensors, the definition is wide and comprehensive of other technological approaches. It includes, for example, other physical means of information exchange, such as those based on chemical or optical signals. In addition, the definition takes into account that interfacing can occur at different levels, either of individual cells or ensembles, and that communication can be uni- or bi-directional.

Levels of brain-chip interfacing

In these cases, individual microdevices sample the activity of a population of cells rather than of single neurons. Signals are in the form of Local-Field-Potentials (LFPs), multi-unit or single unit activity. In general, even if single-units can be detected and identified, they originate from the activity of several neurons distributed in the proximity of the sensor and can be reduced, therefore, to a population recording scheme. Finally, the third level of interfacing is represented by chip implants in the brain or other parts of the nervous system, such as the spinal cord, peripheral nerves or sensory organs.

Nural network with brain chip

The brain functions are carried out by neural networks which collect all the information from every individual cell body with the help of Nerve cell and connect each other forming a neural network in brain to process the activities a human does. The neural network is linked with brain chips electrically, the electrode sensors of brain chips are used to record each signal sent by brain. We can culture brain cells directly on top of chip and really exciting part is that they grow on chip with a tight electrical coupling. It carries out the algorithm through different networks to connect this we have synapses in the piece of brain like motor cortex, Spinal cord and sensory organs. In size of pin hair (as small as you can imagine), over 40 million synapses that connect to 30,000 neurons. Nerve cells are messengers between the cells they control algorithm.

Evolution towards brain chip interface

Brain chip implants are know part of modern culture. In 1929 the device called EEG (Electro Encephalography) was invented by HANS BERGER in the field of human brain research which helped to record the human brain signals. When it comes to this topic we remember the works of JOSE DELGADO who implanted electrodes in animal brain and attached them to a "STIMOCEIVER".

How does it works?

The chip can be implanted in the human brain. The extension wire of chip is connected to pedestal connector that records all the patterns made by neural connections that controls all the activities of brain. Then this connector sends all the signals to neural signal interpreter through fiber optic cable. The neural signal interpreter converts the brain signals into digital signals and sends it to computer; the computer mimics all the functions of brain activities and sends it to the prostatic device which helps patients to do movements just by the thoughts of the patient's brain.

CMOS Chips for Neural Tissue Interfacing

an electrolyte above the surface of a solid-state chip with the surface of the chip providing voltage-sensitive sites in a regular spatial arrangement. Moreover, between the tissue and the surface a cleft of the order of 50 nm thickness is formed. In Fig. 2 depicts two different approaches to form the voltage-sensitive device: On the left, the site is made by means of a noble metal electrode, which is connected to further signal-processing circuitry. Commercially available Multi-Electrodes-Arrays (MEAs) use this approach and separate a number of such noble metal electrodes arranged within a 2D array from each other in the lateral direction by an insulating substrate material. Ideally, noble metal electrode and electrolyte form a capacitor with a very thin so-called Helmholtz double layer capacitance. Whereas in this case the capacitance per area is very high, so that cleft-voltage coupling to the electrode is very efficient, the entire surface consists of a chemically non-homogeneous surface, as electrodes and the insulating material between the electrodes periodically alternate.

Perspectives of BCHIs in neuroprosthetics

Although preliminary evidence has been provided that BCHIs can be employed to drive neuroprosthetic devices in humans, there is a long way to go before the demonstration of reasonable advantages justifying an extensive use of this approach at the clinical level. As an example, BCHIs potentially offer the possibility of on-chip integration of neuromorphic substitutes of brain circuits. A recent report provides an example of a cerebellar microcircuit with a model based neuroprosthetic device .

Advantages

Reliable: It is consistently good at performance. It is trusted by researchers to implant safely in human brain. Adaptive: It is essential for a human brain to expand the power.

Self learning: Brain chips can enhance memory to a large extent. Contextual: Depending on the circumstances brain chips can be used effectively. **Personalized**: Brain chips can be produced to meet patient's individual requirements. Productivity: Brain chips very effective for human brain in increasing its cognitive ability.

Security: Brain chips can secure human memory without memory loss

Disadvantages

It is difficult to afford. Risk of surgery.

Conclusion

The invention of brain chip implant technology is boon for patients with neurological diseases its revolution in the field of engineering and neuro science. Brain chip technology which involves communication based on neural activity of brain. The results are spectacularly wonderful and unbelievable. The advantage of brain chips with nano technology will allow researchers for smaller and superior chips making brain chips technology less burdens some and more reliable option for people. More effective for restoring limbs function of patients. Rehabilitations for patients. Finally it has amazing endless advantages

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