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Ethical behavior of implanting electronic chip in the brain

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ABSTRACT

We have long used mechanical devices to compensate or physical disability, it may be possible to augmented mental capacity to add memory or carbon-based neural net 'wetware' brains-at a point in history, when we might be able to imprint the circuitry of the human brain using transistors on a silicon chip? Brain Chip-a direct interface between the biological information processing system of the brain and neurons system and the artificial information processing system of microprocessors and silicon electronics. The brain is a parallel processor. The colorful blue jay, I see flitting from tree to tree in my garden appears as a single image. But the brain divides what it sees into four component-color, motion, shape & depth. These are individually processed-at the same time-and compared to my stored memories. My brain combines all of these processes into one image, that's just vision aspect of a multiplexed moment of perception..- The human cortex has about 22 billion neurons and 220 trillion synapses. In this paper, we purpose to initiate ethics of implanting computer chip in the Brain and focuses on issues of manufacturing and scientific responsibility, anxieties about possible usage in children, and most troubling, issues of privacy and autonomy.

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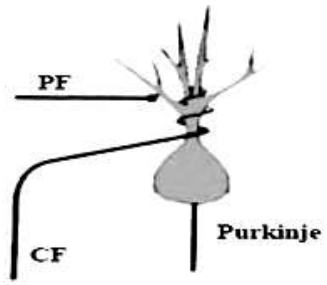
Introduction

There is no doubt of the essential role of discrete neuronal networks in brain function. Nevertheless, models of brain function based on neuronal networks alone fail to answer the various fundamental questions of how the brain works, such as, "What is the neuronal substrate of consciousness? ", or "Why do anesthetic effects diminish at higher atmospheric pressure?", or "How can purely endogenous processes be initiated?" These are but a few examples of as yet unsatisfactorily addressed questions. In spite of concerted effort by preeminent neuroscientists, no single complete theory of brain function explaining these phenomenology's has been offered. This void strongly suggests that there is a *missing link* in the current fundamental concept of how the brain works. This apparent impasse in neuroscience has recently been surmounted by the Vortex Theory; the theory is firmly based on biological and anatomical reality, essential considerations for any biological hypothesis. This manuscript is an introduction to the fundamental architectural unit of the association cortex in the Vortex Theory, namely, the *brain chip*. There can be few more potent ideas in futurology and science fiction than that of the *brain chip* – a direct interface between the biological information processing systems of the brain and nervous system and the artificial information processing systems of microprocessors and silicon electronics. Chip is an electronic device which has lot of memory to store data.

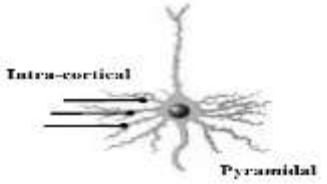
Three part of development

Physiology:

Research on synaptic plasticity in the cerebellum has dramatically advanced the concept of brain function. Functionally, the cerebellum is now considered to be an organ collectively formed by identical functional units. The individual unit is referred to as "cerebellar chip", in analogy to a computer chip.



Each cerebellar chip has a single output neuron, the Purkinje cell. Information to the cerebellum is first processed by numerous preprocessing neurons, such as the granular cells, and eventually reaches the Purkinje cells via parallel fiber (PF) input(4). The transmission efficacy of the synapses between parallel fibers and Purkinje cells is modifiable, forming the basis of synaptic plasticity, and provides the substrate of the cerebellar learning process. The outcome of cerebellar system output is examined in other systems, and error signals are fed back to each Purkinje cell if the outcome is undesirable. These error signals are carried by the climbing fibers and provide the learning trigger for the corresponding Purkinje cells(5).



Pyramidal Cells

Ontogeny:

Ontogenetic development of the cerebral cortex well described. The cells which eventually form the six-layered cortex migrate from the surface of the lateral ventricle provided

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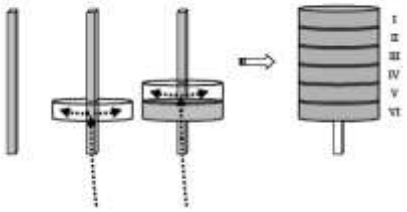
by the radial glial fibers six-story building were constructed beginning from first to sixth and define the gross shape of the brain(3).



Following completion of brain formation , the radial glial fibers will disappear.

Biology:

Astrocytes are a cousin of neurons. The primary role of astrocytes is the physical support of neurons. It's function for protecting neuron networks.

Related Work

Research in sensory substitution has made slow progress in recent years. Especially in vision, due to the knowledge of the working of the visual system, eye implants (often involving some brain implants or monitoring) have been applied with demonstrated success. For hearing, cochlear implants are used to stimulate the auditory nerve directly. The vestibulocochlear nerve is part of the peripheral nervous system, but the interface is similar to that of true brain implants(9).

Proposed Work

We have seen more biological events in our environment that have some functionality and instructions to complete any task . this is all over the natural process. Now at the time of information technology ,different technologies has come and that are merge together and form a new technology known as hybrid technology(1).

We can use biological technology in information technology and in mechanical devices also. it means that we implement such a chip that governs the biological activities like humans. Basis of these biological events,

In a human brain more numbers of neurons which is followed into different-different directions. Each neuron has its unique weight and some numeric value. Many activity performed causes the flow of these neurons in the brain. This may be the alternative method of perception & learning of a machine.

So, we can create a chip, in which neurons are connected, known as BRAIN CHIP.

When any action performed by a person, it caused by some signals passes to the brain through dendrites (part of neurons) then neurons will flow to do some task(2).

A function is created for any action:

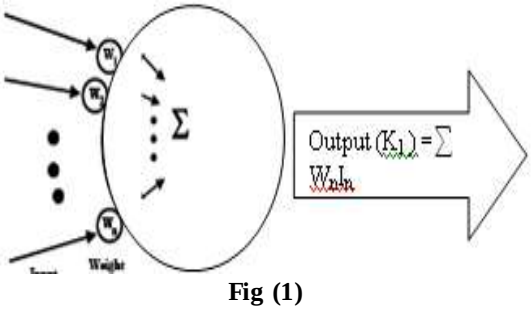


Fig (1)

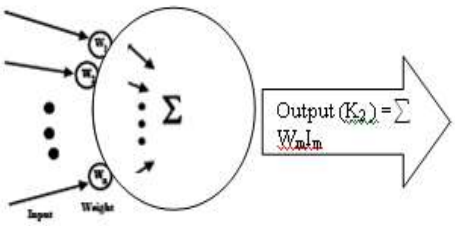
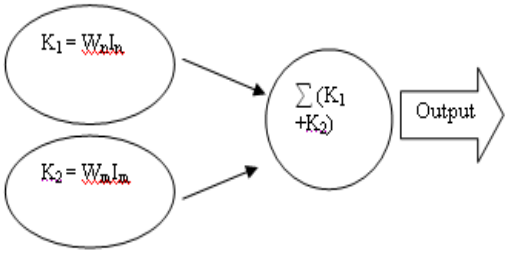


Fig (2)

Fig (1) for one activity:
In represents the numbers of input neurons
Wn represents weight of each neuron
K1 represent the sum of all active neurons
Fig (2) for second activity:
Im represents the numbers of input neurons
Wm represents weight of each neuron
K2 represents the sum of all active neurons

Now we merge these two acitivities and complete any task:

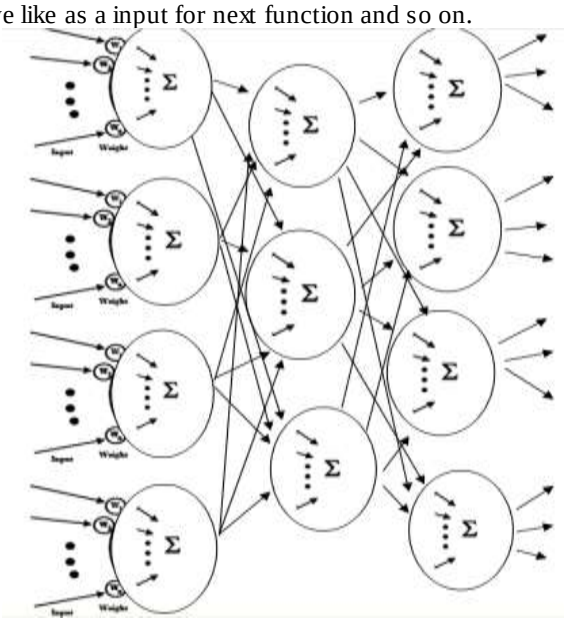


Output $(k_1) = \sum (W_1I_1\ W_2I_2\ W_3I_3 + \ldots\ldots\ldots\ W_nI_n)$
Output $(k_2) = \sum (W_1I_1\ W_2I_2\ W_3I_3 + \ldots\ldots\ldots\ W_mI_m)$

Example: The brain chip is designed into the some dedicated manner like STRESS DETECTION and STRESS MANAGEMENT to find mental disorder and do some specific action for physically confused.

Performed first activity function (shown by fig (1)) for angry men and second activity function (shown by fig (2)) for to relax mind. So, we can conclude these two functions in sequence then the mind will be relaxed of that person. Like this we can merge more than two functions to perform multiple tasks through brain chip.

In multiple network the output of the previous neuron is behave like as a input for next function and so on.



Processes information by sending electrical signals from neuron-to-neuron using the "wiring" of dendrites and axons.

Conclusion

When people started to map neurons into electronic chip: We recording data from neural tissues describing the neurons and synapses and their connectivity, recording data from many, many neural cells and putting them in databases, The neurons could be modeled in detail, they would be far too complicated to implement either in software or hardware, The first effort is a network of 300 neurons and half a million synapses on a single chip, Since the neurons are so small, the system runs 100,000 times faster than the biological equivalent and 10 million times faster than a software simulation.

Result:

We can simulate a day in one second.

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Biography

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