

Comparative Study Between Natural Brain And Blue Brain

Supriya Yawalkar¹, Prof.P.D.Soni²

^{1,2} Dept of Coputer Science And Engineering

^{1,2} P.R.Pote(Patil)College Of Engineering And Management, Amravati

Abstract- Human brain is the most valuable creation of God, but such creation comes to an end when a person reaches to the last stage. The man is intelligent because of the brain."Blue Brain" is the name of world's first virtual brain, which means a machine that can function as human brain. Blue brain is the project that describe how human brain intelligence can be preserve for thousand of years and what methodology will be used. Blue Brain Project is the first made comprehensive attempt to reverse engineer the brain of mammalian. Today scientist are in research to create artificial brain that can think, response, take decision and keep everything in memory .After the death of the body, virtual brain will act as the man. So that, a person will not lose the knowledge, intelligence, personalities, feelings and memories of that man that can be used for the development of our society.This paper present the research work which explains the concept and functioning model of blue brain and the recent research and development in the process.

Keywords- Blue Gene, Nanobots. Neurons, Neo-cortical, Reverse engineering, Simulation

I. INTRODUCTION

Intelligence is a boon that is created inborn .Intelligence is needed everywhere and in every field. Today human kind are developed because of intelligence. Some people have this quality, so that they can think up to such an extent where other can't reach. The present era, too needs intelligent brain for human society's sake,but this boon is limited to human's body and after death that intelligent brain stops working .It would be the best if can create that brain artificially. Virtual brain is the key solution to it. No one has ever understood the complexity of human brain. It is complex than any other circuitary in the world .So the question may arise, Is it really possible to

Possible create a human brain?.Yes,it's

Possible.Artificial brain is named as blue brain(Henry Markram)[2].

With the help of this virtual brain, brain and intelligence remains alive even after the body gets destroyed. So the brain along with its knowledge intelligence and memory of any person can be kept and used forever. Blue Brain also overcome the difficulties encountered in remembering things, such as people's names, their birthdays and the spellings of words, proper grammar, important dates , roads and routes, history, facts, theorems, arithmetic equations[11].

The Blue Brain Project was aimed to build a full computational model of a functioning brain to cure drug treatment or any other brain related problem. Blue gene supercomputer constructed by IBM was a machine first used by Blue Brain Project and there a term Blue Brain was introduced. The back bone of blue brain is artificial intelligence, a technology which builds intelligent machine and impare intelligent agents[5].

The project was founded in may 2005 by Henry markram at the EPFL (Ecole Polytechnique Federale De Lausanne) research university in Switzerland. Finally, a cellular level simulation of the human brain, equivalent to 1,000x the size of rat brain is predicted to finish by 2023[11].

Motivations:-

1. Treatment of brain disfunctioning,
2. Scientific curiosity about consciousness and human mind,
3. A bottom up approach towards building thinking machine[1].

Nowadays , a number of people is suffering from brain disease ,it is an alarming stage to fight against these disease and finding suitable treatments .Practically it is very difficult to study a living brain, so virtual brain(blue brain)makes it possible.

II.WORKING

The intelligent machine manufacturing can be governed by three steps:

1. Data acquisition
2. Simulation
3. uploading the simulated brain

A.DATA ACQUISITION

The step involves studying various types of neuron and categorize them. This categoring obtained by placing brain slices under microscope and measuring shape and electrical activity of each neuron.Categoring is done on the basis of their shape ,electrophysiological behavior,location in cortex and population density.These observation are then translated into mathematical algorithm which correctly justify the form, function and positioning of neuron. The algorithm are then used to generate biologically realistic virtual neuron ready for simulation.

B.SIMULATION

Simulation refers to concept of creating computer based model of brain and neuron connection. The main focus for the creation of artificial brain is on the neuron and these neuron simulation is established using primary software called NEURON. The software was developed in 1990 by Michael Hines and John Morey ,written in C, C++, FORTRAN.

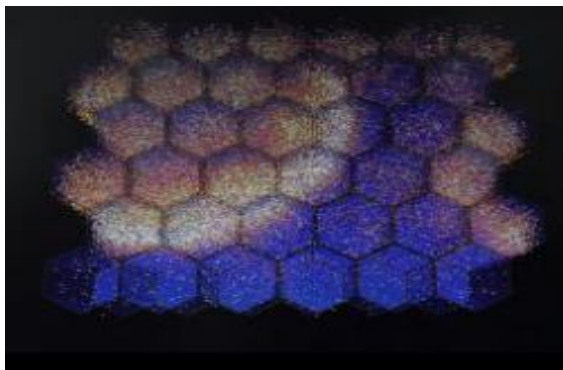


Fig2:cortical mesocircuit simulation

C.UPLOADING

The third and final step in process of building virtual brain, is uploading of the simulated brain using Nanobots . Nanobots are the most trustworthy factor for uploading. These nanobots are so tiny in size that they can travel throughout our circulatory system. The activity and structure of our central nervous system is examined by them and provide complete readout of connection between each neuron. Furthermore, this captured data is uploaded and stored into supercomputer. This stored data helps the machine to function as the real brain

III.COMPARITIVE STUDY

CONTENT	NATURAL BRAIN	BLUE BRAIN
1.INPUT	In the human body the neuron are considered to be responsible for the message passing. The body receives the input by sensory cells. These sensory cells generate electric impulses which are received by the neurons. The neurons transfer these electric impulses to the brain.	The scientist has already created artificial neurons by replacing them with the silicon chip. The same electric impulses are received by artificial neuron and send to a super computer for the interpretation.
INTERPRETATION	The electric impulses received by the brain from the neurons are interpreted in the brain. The interpretation in the brain is accomplished by the means of certain states of many neurons.	The electric impulses received by the artificial neuron can be interpreted by means of a set of register. Each state has its own values in the registers.
3.OUTPUT	The brain sent electric impulses representing the responses are received by sensory cells. The sensory cells of which part of our body is going to receive that ,it depends upon the state of the neurons in the brain at that	Similarly depending on the states of the register the output signal can be given to the artificial neurons which will be received by the sensory

	time.	cell.
4.MEMORY	There are specific neurons in our brain which represent certain states permanently. When we try to remember something these state is interpreted by our brain and we can remember the past things. For this neurons are forced to declare that particular state of the brain.	It is impossible to store the data permanently by using the secondary memory. In the similar way the required states of the register can be stored permanently. And when we need these information can be retrieved whenever required.
5.OUTPUT	When we take decision, think about something, or make any logical calculations are done in our neural circuitry. The past experience stored and the current input received are used and the states of certain neurons are changed to give the output.	In a similar way the decision making can be done by the computer by using some stored states and the received input and by performing some arithmetic and logical calculations.

TABLE I: Comparison of natural brain and blue brain[9,10,11].

IV.CONCLUSION

At some point it will be possible to transform natural brain into computer in near future. This paper’s Comparative study assure the fact that natural brain can be stored or recreated .magical.Despite the complexity, it can be said that the BBP would work wonders for the human society.

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