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Blue Brain Technology

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Abstract: ***"Blue brain" is the name of the world's first virtual brain. It allows to transfer all the substances of human brain to virtual brain like PC. That means a machine can function as human brain. In other words, human is does not live for thousands of years but the information in his mind could be saved and used for several thousands of years. Today scientists are in research to create an artificial brain that can think, response, take decision, and keep anything in memory. The main aim is to upload human brain into machine. So that man can think, take decision without any effort. After the death of the person the virtual brain can store the knowledge, intelligence, personalities, feelings and memories of that person that can be used for the development of the human society.***
Keywords: Blue Brain, Brain, Neurons, Sensory System

I. INTRODUCTION

This Human brain, the most valuable creation of God. The man is called intelligent because of the brain. Today we are developed because we can think, that other animals can not do .But we loss the knowledge of a brain when the body is destroyed after the death of man. That knowledge might have been used for the development of the human society. What happen if we create a brain and up load the contents of natural brain into it. This BLUE BRAIN project was founded in May 2005 by Henry Mark ram at the EPFL in Lausanne, Switzerland.

Blue Brain "The name of the World's first virtual brain. That means a machine that can function as human brain. Today scientists are in research to create an artificial brain that can think, response, take decision, and keep anything in memory. The main aim is to upload human brain into machine. So that man can think, take decision without any effort. After the death of the body, the virtual brain will act as the man .So, even after the death of a person we will not loose the knowledge, intelligence, personalities, feelings and memories of that man that can be used for the development of the human society. No one has ever understood the complexity of human brain. It is complex than any circuitry in the world. So, question may arise is it really possible to create a human brain? The answer is Yes. Because what ever man has created today always he has followed the nature. When man does not have a device called computer, it was a big question for all .But today it is possible due to the technology. Technology is growing faster than every thing.

II. OVERVIEW OF BLUE BRAIN

The IBM is now developing a virtual brain known as the Blue brain. It would be the world's first virtual brain. Within 30 years, we will be able to scan ourselves into the computers. We can say it as Virtual Brain i.e. an artificial brain, which is not actually a natural brain, but can act as a brain. It can think like brain, take decisions based on the past experience, and respond as a natural brain. It is possible by using a super computer, with a huge amount of storage capacity, processing power and an interface between the human brain and artificial one. Through this interface the data stored in the natural brain can be up loaded into the computer. So the brain and the knowledge, intelligence of anyone can be kept and used for ever, even after the death of the person.

III. WORKING OF HUMAN BRAIN

A. Sensory Input

When our eyes see something or our hands touch a warm surface, the sensory cells, also known as Neurons, send a message straight to your brain. This action of getting information from your surrounding environment is called sensory input because we are putting things in your brain by way of your senses.

B. Integration

Integration is best known as the interpretation of things we have felt, tasted, and touched with our sensory cells, also known as neurons, into responses that the body recognizes. This process is all accomplished in the brain where, many neurons work together to understand the environment.

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C. Motor Output

Once our brain has interpreted all that we have learned, either by touching, tasting, or using any other sense, then our brain sends a message through neurons to effecter cells, muscle or gland cells, which actually work to perform our requests and act upon our environment.

IV. NEED OF BLUE BRAIN

Now the world is very much developed because of the intelligence we have which is an inborn quality and cannot be made. Few people in the world have such quality and because of it, they can think up to a level or standard which others cannot do. There is a necessity of such an intelligence and intelligent brain to the human society but the intelligence gets lost after the death of the body and virtual brain is the solution for all these.

Everyone is busy in their lives that they have the difficulty in remembering the events like historical facts, important dates and much more. Availing a machine called the virtual brain is a complete solution for all these issues and relaxes the people without any burden.

V. STEPS FOR BUILDING A BLUE BRAIN

1) Data collection
2) Data simulation
3) Visualization

VI. DATA COLLECTION

It involves collecting brain portions, taking them under a microscope, and gauging the shape and electrical behavior of neurons individually. This method of studying and cataloguing neurons is very familiar and worldwide. The neurons are captured by their shape, electrical and physiological activity, site within the cerebral cortex, and their population density. These observations are translated into precise algorithms which describe the process, function, and positioning methods of neurons. Then, the algorithms are used to generate biologically-real looking virtual neurons ready for simulation.

VII. DATA SIMULATION

It concerns with two major aspects:

1) Simulation speed
2) Simulation workflow Simulation speed Simulations of one cortical column (more than 10,100 neurons) run about two hundred times slower than real time. It takes about five minutes to complete one second of stimulated time. The simulations display unevenly line scaling. Presently the major seek is biological soundness rather than presentation. After understanding biologically significant factors for a given effect it might be feasible to crop constituents that don't subsidize in order to advance performance. Simulation overflow making virtual cells using the algorithms, written to define and describe real neurons, is the major seek of this step. Algorithms and constraints are adapted according to the age, species, and disease stage of the animal being simulated. Each one of the protein is simulated. Note: there are hundreds of millions of proteins in one cell.

VIII. BBP-SDK

The Blue Brain Project - Software Development Kit, a set of Application Programming Interfaces allows the researchers to use and audit prototypes and simulations. The Blue Brain Project SDK is a C++ library wrapped in Java and Python. The primary software used by this for neural simulations is NEURON. Michael Hines of Yale University and John Moore at Duke University developed this in the starting of the 1990s. It uses C, C++, and FORTRAN. It is freely available open source software. The website makes everything available including the code and the binary data freely. Michael Hines in cooperation with BBP team in 2005 ported the package into the massive and parallel Blue Gene.

IX. VISUALIZATION OF RESULTS

RT Neuron RT Neuron is the main application that Blue Brain Project uses for visualization of neural simulations. The BBP team developed this software internally. It is coded using C++ and OpenGL. RT Neuron is ad-hoc software written specifically for neural simulations, i.e. it can’t generalize to other kinds of simulation.

RT Neuron takes the output from Hodgkin-Huxley simulations as input in NEURON and delivers them in 3D. This allows the programmers and researchers to view as activation potentials propagate through or between neurons. The animations can be paused, stopped, started and zoomed, hence allowing the researchers to interact with the model. The visualizations are multi-scale.

X. UPLOADING HUMAN BRAIN

The uploading is possible by the use of small robots known as the Nanobots. These robots are small enough to travel throughout our circulatory system. Traveling into the spine and brain, they will be able to monitor the activity and structure of our central nervous system. They will be able to provide an interface with computers that is as close as our mind can be while we still reside in our biological form. Nanobots could also carefully scan the structure of our brain, providing a complete readout of the connections. This information, when entered into a computer, could then continue to function as us. Thus the data stored in the entire brain will be uploaded into the computer.

XI. ADVANTAGES OF BLUE BRAIN

1) Gathering and Testing 100 Years of Data.
2) The blue brain can remember the things with less effort.
3) The blue brain is an easy way to store and use human intelligence and data or information present in the mind even after the death of the body.
4) It can do all important functions like an intelligent machine.
5) A Novel Tool for Drug Discovery for Brain Disorders

XII. DISADVANTAGES OF BLUE BRAIN

1) It increases the risk of human dependency on Blue Brain every time.
2) Once a Blue Brain related to a particular person's neural schema is hacked, the brain could be used against the person.
3) Another fear is about human clothing and regaining the memory back is an expensive procedure.

XIII. CONCLUSIONS

In conclusion, we will be able to transfer ourselves into computers at some point. Most arguments against this outcome are seemingly easy to circumvent. They are either simple minded, or simply require further time for technology to increase. The only serious threats raised are also overcome as we note the combination of biological and digital technologies.

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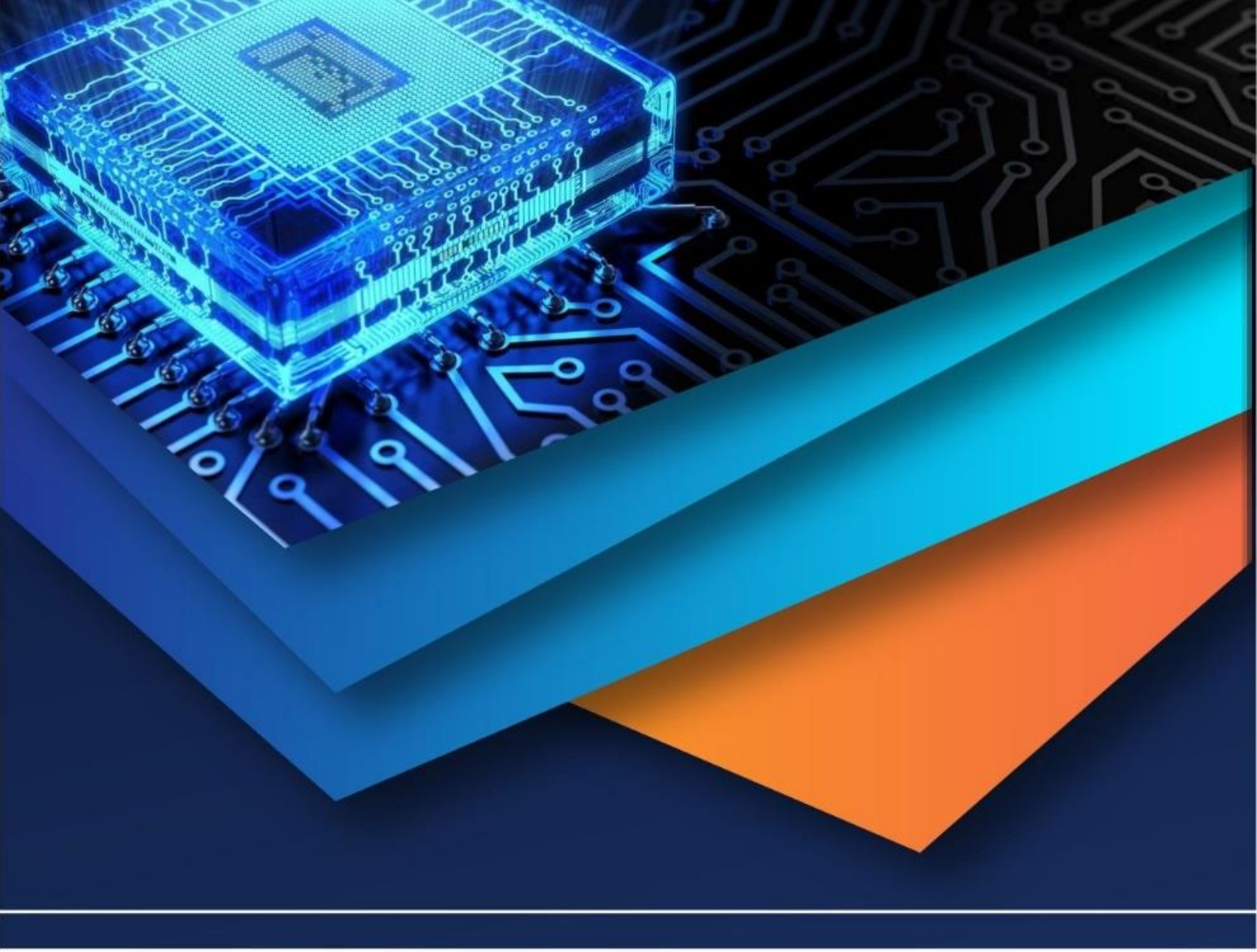

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