K. Preethi *et al*, International Journal of Computer Science and Mobile Applications,
Vol.7 Issue. 1, January- 2019, pg. 10-15 **ISSN: 2321-8363**
Impact Factor: 5.515

BLUE BRAIN- A MAGIC OF HUMAN BRAIN

K. Preethi[1]; P.Saranya[2]; D.Shobana[3]

[1, 2]Student, [3]Assistant Professor Department of Information Technology

Sri Krishna Arts & Science College, Coimbatore, Tamil Nadu, India

[1] preethik18mit014@skasc.ac.in; [2] saranyap18mit014@skasc.ac.in; [3] shobanad@skasc.ac.in

Abstract: Blue Brain is that the name of the world's 1st virtual brain. A Virtual machine is one that may perform as, a really applicable application of a synthetic Intelligence human brain. Reverse engineering may be a foremost conception of implementing the human brain and recreate it at the cellular level within a whole simulation. The four major motivations behind the Blue Brain Technology square measure treatment of brain disfunctioning, scientific curiosity concerning consciousness and human mind, a bottom up approach towards building thinking machine and databases of all neuroscientific analysis results and connected past stories. There square measure 3 main steps 2to build the virtual brain square measure information acquisition, simulation and mental image of results. The mission is enterprise the Blue Brain technology is to collect all existing data of the brain, raise the worldwide analysis potency of reverse engineering and to create a whole theoretical framework.

Keywords: 3D Blue Brain, Neurons, Nurolucida, Nanobots, consciousness, supercomputer, Diagnosis, neuroscience, intelligence

INTRODUCTION

The first one to explore about a true "Artificial Intelligence" via the process of reverses engineering and also the effort to reverse engineering a human brain was assumed to be the blue brain project. Blue brain was simply developed as a virtual brain by IBM. Virtual brain is the world's first blue brain. It is not actually a natural brain. It is a artificial brain but can act as a brain, that is a virtual brain. They will have the capacity to think like a brain, take decisions based on the past experience, and respond as a natural brain. By using a super computer it will be possible, with a huge amount of storage capacity, processing power and an interface between the human brain and artificial one. The data stored in the natural brain can be up loaded into the computer, through this interface. So even after the death of the person the brain and the knowledge, intelligence of anyone can be kept and used for ever.

BLUE BRAIN

In May 2005 the blue brain was founded by Henry Mark ram at the EPFL in Lausanne, Switzerland. To gain a complete understanding of the brain was the main goal of the project and for the development of brain disease treatments in a better and faster manner. Hence studying slices of living brain issue using microscopes and patch clamp electrodes are involved in research. The data being collected is used to build biologically realistic models of neurons. The data collected are of different neurons and networks of neurons in the cerebral cortex. The name blue brain was called because of the simulations carried out on a Blue Gene supercomputer built by IBM, The simulation software is based on Michael Hines's NEURON, together with other custom built components.

3D BLUE BRAIN:

First digital 3D atlas of each cell within the mouse brain provides neuro-scientists with antecedent inaccessible data on major cell sorts, numbers and positional together 737 brain regions – which is able to probably accelerate progress in Neuroscience massively. Free by EPFL's Blue Brain Project and printed in Frontiers in Neuro informatics, the Blue nerve cell Atlas integrates information from thousands of whole brain tissue stains into a comprehensive, interactive and namicon-line resource that may unendingly be updated with new findings. [1]

C.M OTIVATION OF BLUE BRAIN:

Four broad motivations behind the Blue Brain Project are:

- Brain disease treatments
- Scientific curiosity regarding consciousness
- the human mind Integration of all neuro scientific analysis
- worldwide Progress towards building thinking machines

One in four individuals can suffer from one amongst around 560 brain diseases throughout their life. Thus it's vital to own an honest strategy for understanding these diseases and finding appropriate treatments. The living brain is extremely tough to check. A virtual model, however, makes direct observation potential. Experiments on models also are a lot of economical and limit the requirement for laboratory animals. The Blue Brain Project, by together with molecular-level simulations, may be wont to study the result of latest pharmaceutical compounds on virtual brains of any species, age, and stage of malady. Another aim of the Blue Brain Project is to supply a centrally coordinated resource for the two hundred, 000 active neuro scientists within the world. Antecedent every scientist has centered on their own specialist field while not the results being shared and simply offered to all or any. The BBP hopes to make an even bigger, higher platform for neuroscientists to experiment on. The project is changing into a brain simulation facility that's accessible to all or any. [2]

FUNCTIONS OF HUMAN BRAIN

1. SENSOR INPUT:

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

2. INTEGRATION:

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

3. 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.

NEEDS OF BLUE BRAIN

- Intelligence is the in born quality that can't be created. Some folks have this quality, so that they can think up to such an extent where other can't reach.
- Human society is always need of such intelligence and such an intelligent brain to have with. But the intelligence is lost beside the body once the death.

- The virtual brain is a solution to it. The brain and intelligence can alive even once the death.

We often face difficulties in remembering things such as people's names, their birthdays, and the spellings of words, proper grammar, important dates, history, facts etc… In the busy life every one want to be relaxed. Virtual brain may be the solution to it.
Need of blue brain in Human society is usually in would like of such intelligence associated such an intelligent brain to own with. However the intelligence is lost on with the body once the death. The virtual brain could be a answer thereto. The brain and intelligence are going to be alive even once the death. We often face difficulties in basic cognitive process things like folk's names, their birthdays, and therefore the spellings of words, proper grammar, vital dates, history facts, etcetera. Within the busy life everybody desires to be relaxed. Virtual brain could also be a far better answer for it. [3]

STEPS FOR BUILDING THE BLUE BRAIN:

1. Data collection
2. Data simulation
3. Result Visualization

1. DATA COLLECTION:

It involves collection brain parts, taking them below a microscope, and gauging the form and electrical behavior of neurons one by one. This technique of finding out and cataloguing neurons is incredibly acquainted and worldwide. The neurons square measure captured by their form, electrical and physiological activity, website inside the cerebral mantle, and their population density. These observations square measure translated into precise algorithms that describe the method, function and positioning ways of neurons. Then, the algorithms square measure accustomed generate biologically-real trying virtual neurons prepared for simulation.

2. DATA SIMULATION:

Simulation speed Simulations of 1 cortical column (more than ten,100 neurons) run regarding 2 hundred times slower than real time. It takes regarding 5 minutes to complete one second of excited time. The simulations display erratically line scaling. Presently the main look for is biological soundness instead of presentation. After understanding biologically vital factors for a given impact it might be possible to crop constituents that do not subsidize so as to advance performance.

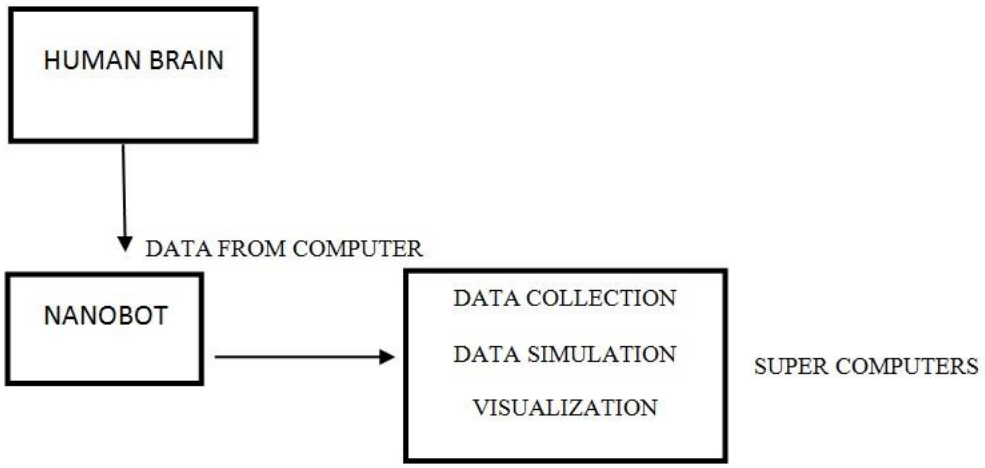
3. BBP-SDK:

The BBP-SDK (Blue Brain Project -software package Development Kit) could be a set of software package categories (APIs) that enables researchers to utilize and examine models and simulations. The SDK could be a C library wrapped in Java and Python.[4]
The primary computer code utilized by this for neural simulations is somatic cell. Michael Hines of Yale University and John Moore at Duke University developed this within the beginning of the Nineteen Nineties. It uses C, C++, and FORTRAN. It is freely available open source software. The website makes everything accessible as well as the code and also the binary information freely. Michael Hines in cooperation with BBP team in 2005 ported the package into the huge and parallel Blue sequence.

4. RESULT VISUALIZATION:

RT somatic cell RT somatic cell is that the main application that Blue Brain Project uses for image of neural simulations. The BBP team developed this software system internally. It's coded exploitation C++ and OpenGL.

RT somatic cell is ad-hoc software system written specifically for neural simulations, i.e. it can't generalize to other forms of simulation. RT somatic cell takes the output from Hodgkin-Huxley simulations as input in somatic cell and delivers them in 3D. This allows the programmers and researchers to look at as activation potentials propagate through or between neurons. The animations can be paused, stopped, started and zoomed, thus permitting the researchers to act with the model. The visualizations are multi-scale (they will render individual neurons or an entire plant tissue column).



PROS AND CONS:

PROS:

- Blue brain is Associate in nursing approach to store and utilize human intelligence and knowledge gift within the mind even once human dying.
- it's a crucial move towards self-decision creating by the pc or machine that holds a Blue brain.
- Business analysis, attending conferences, reporting, etc. square measure terribly important functions that Associate in nursing intelligent machine will do systematically.
- It will be used as Associate in nursing interface between human and animal minds. The BBP has become victorious in rat and a few other animals that may be a sign of success.
- It an honest remedy towards human incapacity sort of a deaf will get the data via direct nerve stimulation.

CONS:

- It will increase the chance of human dependency on Blue Brain when.
- Once a Blue Brain associated with a selected person's neural schema is hacked, the brain may be used against the terribly person.
- Since it Associate in Nursing approach to form machines intelligent and thoughtful it will increase the chance of machines conducting war against human (like we've got been looking at within the movies like slayer, Universal soldier, etc.).
- Due to blue brain system kinsfolk can become captivated with the pc systems. Technical information could also be misused by hackers; pc viruses can cause associate degree more and more essential threat. [5]

UPLOADING HUMAN BRAIN

The small robots known as the Nanobots are used for uploading possibility. The robots are small enough to travel throughout our circulatory system. It will be able to monitor the activity and structure of our central

nervous system by travelling into the spine and brain. It 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. By providing a complete readout of the connections nanobots could also carefully scan the structure of our brain. When entered into a computer, the information could then continue to function as us. So hence from the entire brain data stored will be uploaded into the computer.

There is a method referred to as information acquisition where by practice nurolucida software system package that runs on windows computing machine, we've an inclination to reconstruct the vegetative cell 3D morphologies by taking the brain slices from the living being. For the Blue brain project a twelve patch clamp instrument was specially developed for it that studies the behavior of neurons. [6]

APPLICATIONS:

- 100 Years of Data are gathered and tested
- The Neural Code are cracked
- The process of Understanding Neocortical Information
- The Novel Tool for Drug Discovery for Brain Disorders
- The Global Facility
- The Foundation for Whole Brain Simulations
- The Foundation for Molecular Modeling of Brain Function

IN FUTURE

The synthesis era in neuroscience started with the launch of human brain project and is inevitable phase triggered by a critical amount of fundamental data .Before beginning such a phase the data set does not need to be completed. To allow hypothesis testing and organize all knowledge of the brain, rapid diagnoses of brain malfunction as well as development of treatments for neurological disorders, detailed models will probably become the final form of databases. In short, we can hope to learn a great deal about dysfunction from accurate models of the brain and function of brain. It will probably take the next decade to model the entire human brain at the cellular level. As with deep blue, Blue Brain will allow us to generate new theories of consciousness and challenge the foundations of our understanding of intelligence.

Blue Brain technology will be used in absolutely paralyzed individuals to communicate with the globe. We have all detected concerning the terribly far-fame's oil writer William Hawking UN agency contains a motor nerve cell un wellness and is entirely paralyzed. It is through a speech generating device that he communicates with the world. He would be in a position to contribute additional to the globe of science if he were physically sound. Through the blue brain technology we'd be in a position to create use of the intelligence of such nice men for the longer term developments. Blue brain technology will be used in animal in order to search out their psychological state, and take precautions if any unfavourable or dangerous scenario happens. GPS enabled chip will be put in human beings like animal to trace the placement if any missing happens. The amount of kidnaps and missing cases will be reduced to an excellent extend therefore serving to the investigators to create their easier and faster. Blue Brain technology will be used to understand the communication between the animals and to study additional concerning them.[7]

CONCLUSION

Hence, at some points we will be able to transfer ourselves into computer. Many of the arguments against this outcome are seemingly easy to circumvent. For the technology to increase they are either simple minded, or simply require further time. The combination of biological and digital technologies is the only serious threats raised and also overcome as we noted. Already researches have been gaining great insights from their model, while the road ahead is long. Then up to 100 cortical columns, 1 million neurons, and 1 billion synapses can be simulated at once by using the Blue Gene supercomputers. Hence they are roughly equivalent to the brain power of a honey bee. Humans have about 2 million columns in their cortices, by contrast. Hence the prediction is made that the project will be capable of this by the year 2023, despite the sheer complexity of such an endeavour.

REFERENCES

[1] https://bluebrain.epfl.ch/
[2] http://www.artificialbrains.com/blue-brain-project#timeline
[3] The Blue brain project, Hill, seen: Mark rams Henry, International conference of IEEE 2008
[4] Henry Markram, 2006 February, "The Blue Brain Project", Nature Reviews Neuroscience, 7:153-160,
[5] RemyaVinayakumar et al, 2015, / (IJCSIT) International Journal of Computer Science and Information Technologies, Vol. 6 (1) , 61-68
[6] https://www.omicsonline.org/open-access/upgrading-human-brain-to-blue-brain-2157-7439-1000287.php?aid=51736
[7] Henry Markram, july 2009, builds a brain in supercomputer, TED conference.

