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Blue Brain - World's First Virtual Brain

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ABSTRACT: 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 cannot 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.

I. INTRODUCTION

'Blue brain' is a 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 lose 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 whatever 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 everything. IBM is now in research to create a virtual brain. It is called "Blue brain ".If possible, this would be the first virtual brain of the world.

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. Is this the beginning of eternal life.

II. VIRTUAL BRAIN AND ITS NEED

We can say Virtual brain is an artificial brain, which does not actually the natural brain, but can act as the brain .It can think like brain, take decisions based on the past experience, and response as the natural brain can. 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 this 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.

Today we are developed because of our intelligence. Intelligence is the inborn quality that cannot be created .Some people have this quality ,so that they can think up to such an extent where other cannot reach .Human society is always need of such intelligence and such an intelligent brain to have with. But the intelligence is lost along with the body after the death. The virtual brain is a solution to it. The brain and intelligence will alive even after 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, and etcetera. In the busy life every one want to be relaxed .Cannot we use any machine to assist for all these? Virtual brain may be the solution to it. What if we upload ourselves into computer, we were simply aware of a computer, or maybe, what if we lived in a computer as a program.

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III. POSSIBILITY OF VIRTUAL BRAIN

First, it is helpful to describe the basic manners in which a person may be uploaded into a computer. Raymond Kurzweil recently provided an interesting paper on this topic. In it, he describes both invasive and noninvasive techniques. The most promising is the use of very small robots, or nanobots. These robots will be small enough to travel throughout our circulatory systems. 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 between each neuron. They would also record the current state of the brain. This information, when entered into a computer, could then continue to function as us. All that is required is a computer with large enough storage space and processing power. Is the pattern and state of neuron connections in our brain truly all that makes up our conscious selves? Many people believe firmly those we possess a soul, while some very technical people believe that quantum forces contribute to our awareness. But we have to now think technically. Note, however, that we need not know how the brain actually functions, to transfer it to a computer. We need only know the media and contents. The actual mystery of how we achieved consciousness in the first place, or how we maintain it, is a separate discussion.

Really this concept appears to be very difficult and complex to us. For this we have to first know how the human brain actually works.

IV.WORKING OF NATURAL BRAIN

The human ability to feel, interpret and even see is controlled, in computer like calculations, by the magical nervous system. Yes, the nervous system is quite like magic because we can't see it, but its working through electric impulses through your body.
One of the world's most "intricately organized" electron mechanisms is the nervous system. Not even engineers have come close to making circuit boards and computers as delicate and precise as the nervous system. To understand this system, one has to know the three simple functions that it puts into action: sensory input, integration, motor output.

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, many neurons work together to understand the environment.

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. The word motor output is easily remembered if one should think that our putting something out into the environment through the use of a motor, like a muscle which does the work for our body.
How we see, hear, feel, smell, and take decision.

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D. NOSE:

Once the smell of food has reached your nose, which is lined with hairs, it travels to an olfactory bulb, a set of sensory nerves. The nerve impulses travel through the olfactory tract, around, in a circular way, the thalamus, and finally to the smell sensory cortex of our brain, located between our eye and ear, where it is interpreted to be understood and memorized by the body.

E. EYE:

Seeing is one of the most pleasing senses of the nervous system. This cherished action primarily conducted by the lens, which magnifies a seen image, vitreous disc, which bends and rotates an image against the retina, which translates the image and light by a set of cells. The retina is at the back of the eye ball where rods and cones structure along with other cells and tissues covert the image into nerve impulses which are transmitted along the optic nerve to the brain where it is kept for memory.

F. TONGUE:

A set of microscopic buds on the tongue divide everything we eat and drink into four kinds of taste: bitter, sour, salty, and sweet. These buds have taste pores, which convert the taste into a nerve impulse and send the impulse to the brain by a sensory nerve fiber. Upon receiving the message, our brain classifies the different kinds of taste. This is how we can refer the taste of one kind of food to another.

G. EAR:

Once the sound or sound wave has entered the drum, it goes to a large structure called the cochlea. In this snail like structure, the sound waves are divided into pitches. The vibrations of the pitches in the cochlea are measured by the Corti. This organ transmits the vibration information to a nerve, which sends it to the brain for interpretation and memory.

V. COMPARING NATURAL & SIMULATED BRAIN

A. NATURAL BRAIN

1. Input

In the nervous system in our body the neurons are responsible for the message passing. The body receives the input by the sensory cells. These sensory cells produces electric impulses which are received by the neurons .The neurons transfer these electric impulses to the brain.

2. 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 many neurons.

3. Output

Based on the states of the neurons the brain sends the electric impulses representing the responses which are further received by the sensory cell of our body to respond. The sensory cells of which part of our body is going to receive that, it depends upon the state ofthe neurons in the brain at that time.

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4. Memory.

There are certain neurons in our brain which represent certain states permanently. When required these state is interpreted by our brain and we can remember the past things. To remember thing we force the

5. Processing

When we take decision, think about something, or make any computation,
Logical and arithmetic 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.

B. SIMULATED BRAIN

1. Input
In a similar way the artificial nervous system can be created. The scientist has already created artificial neurons by replacing them with the silicon chip. It has also been tested that these neurons can receive the input from the sensory cells .So, the electric impulses from the sensory cells can be received through these artificial neurons and send to a super computer for the interpretation.

2.Interpretation

The interpretation of the electric impulses received by the artificial neuron can be done by means of a set of register .The different values in these register will represent different states of the brain.

3. Output

Similarly based on the states of the register the output signal can be given to the artificial neurons in the body which will be received by the sensory cell.

4. Memory

It is not impossible to store the data permanently by using the secondary memory .In the similar way the required states of the registers can be stored permanently. And when required these information can be retrieved and used.

5. Processing

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 .

VI. 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.

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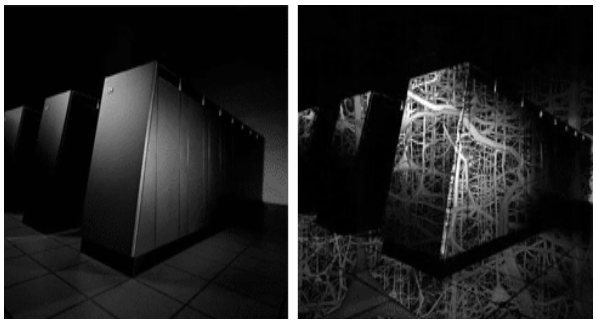
VII. CURRENT RESEARCH WORK

1. IBM, in partnership with scientists at Switzerland's EcolePolytechniqueFederale de Lausanne's (EPFL) Brain and Mind Institute will begin simulating the brain's biological systems and output the data as a working 3-dimensional model that will recreate the high-speed electro-chemical interactions that take place within the brain's interior. These include cognitive functions such as language, learning, perception and memory in addition to brain malfunction such as psychiatric disorders like depression and autism. From there, the modeling will expand to other regions of the brain and, if successful, shed light on the relationships between genetic, molecular and cognitive functions of the brain.



2. Researchers at Microsoft's Media Presence Lab are developing a "virtual brain," a PC-based database that holds a record of an individual's complete life experience. Called MyLifeBits, the project aims to make this database of human memories searchable in the manner of a conventional search engine. "By 2047, almost all information will be in cyberspace including all knowledge and creative works, said one of the project's leaders, Gordon Bell.

3. According to the new scientist Magazine report Rodrigo Laje and Gabriel Mindlin of the University of Buenos Aires in Argentina have devised a computer model of a region of the brain called the RA nucleus which controls muscles in the lungs and vocal folds.

The model brain can accurately echo the song of a South American sparrow. The bird sing by forcing air from their lungs past folds of tissue in the voice box. The electric impulses from the brain that force the lungs had been recorded and when the equivalent impulses were passed to the computer model of the lungs of the bird it begins to sing like the bird.

Mr. Mindlin told the weekly science magazine he was surprised that simple instructions from the brain change a constant signal into a complex series of bursts to produce the intricacies of birdsong.

He plans to add more brain power to his model which might reveal how birds improve their songs and learn them from other birds.

He hopes it might one day be possible to use similar models to map the neural [brain] circuitry of animals without distressing lab experiments - just by recording their calls and movements, the magazine said.

VIII. ADVANTAGES AND LIMITATION

A. ADVANTAGES:

1. We can remember things without any effort.
2. Decision can be made without the presence of a person.
3. Even after the death of a man his intelligence can be used.

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4. The activity of different animals can be understood. That means by interpretation of the electric impulses from the brain of the animals, their thinking can be understood easily.
5. It would allow the deaf to hear via direct nerve stimulation, and also be helpful for many psychological diseases. By down loading the contents of the brain that was uploaded into the computer, the man can get rid from the mad ness.

B. MAJOR LIMITATIONS

Further, there are many new hazardtechnologies will open. We will be susceptible to new forms of harm.
1. We become dependent upon the computer systems.
2. Others may use technical knowledge against us.
3. Computer viruses will pose an increasingly critical threat.
4. The real threat, however, is the fear that people will have of new technologies. That fear may culminate in a large resistance. Clear evidence of this type of fear is found today with respect to human cloningcauses a problem when it comes to long term usage and storage of energy for these batteries. However researchers are continuing to develop the battery in order to make it a more practical replacement for current batteries and sources of energy.

IX. HARDWARE AND SOFTWARE REQUIRMENT

1. A super computer.

2. Memory with a very large storing capacity.

3. Processor with a very high processing power.

4. A very wide network.

5. A program to convert the electric impulses from the brain to input signal, which is to be received by the computer, and vice versa.

6. Very powerful Nanobots to act as the interface between the natural brain and the computer

X. CONCLUSION

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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