Star Tech: A New way to Sense

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Abstract: **Brain is the main functional organ of human body and controls plus monitors all the functions of human body so if we could simulate the brain functions then we could control all the body functions as per our own needs.**
For the same regard, we all here propose a solution to read and stimulate brain waves through a brain headset which will help disabled person to speak, see, and hear intimately.

I. INTRODUCTION

Since in today world, the technology: the problem to every solution is spreading at every corner of world. And, many engineers are dealing with real world problems to achieve solutions to those. Nowadays, disabled persons are unrecognizable to society since they can't stand upon themselves for their right. For this, here we introduced a practical solution paper that motivates these people to stand for their right in society and will help them to interact properly like normal healthy person. Here, we take process brain signals to produce requested audio, image etc. through software coding in hardware part. This idea was emerged from a US patent namely on "Neurosky" which is now a product used by much population of America, Europe etc.

II. LITERATURE SURVEY

We know that brain works on the principle of transmission and receiving of electrical signals and work as per them it is just like we type some words on laptop or pc and they are been shown on our screen as we have provided our pc an external device and it converts that into its own format and shows the result, similarly our brain gets signal for all parts of body and then it analyze them and shows the reflex actions where our task is to develop and product or technology that can influence the brain functions so that if in any case a person is disabled then by this technology we can make the disabled organ functional to a great extent but this technology is not meant for disabled persons with muscle disability like arm or leg disability and due to this reason we can't rectify/modify the changed position of an organ that's why we are much concerned with our sense organ part because there is almost no relation of disability with the structure of a particular sense organ like ear, nose, eye etc. Now our task is to capture the outer environment signals and transmit them to brain in the form that our sense organ used to deliver to the brain for analyzing and giving back the result.
Now we came to the structural and functional unit of brain and that is none other than neuron, there are millions of neurons present in the human body which carry electrical impulses from body to brain and from brain to body organ and other parts etc [1]
Now in a case of disabled person his (say) eyes if is not working or if he is blind then we are concerned with the error in transmission of signals which may be captured by eyes but due to improper functioning of transmission channel that couldn't be transmitted so now our task starts here for technology implementation.
We will give an external signal in the form of electrical signals that too we will work on the phenomenon on which EEG works, we will analyze the external signals and convert it into the format just like we do in the PC and transmit it to the brain and the brain receives the external stimulus and shows reflex actions as shown in the Fig [1.2] [2] each and every neuron transmits its own signals to the next neuron and in this way information reaches to brain.
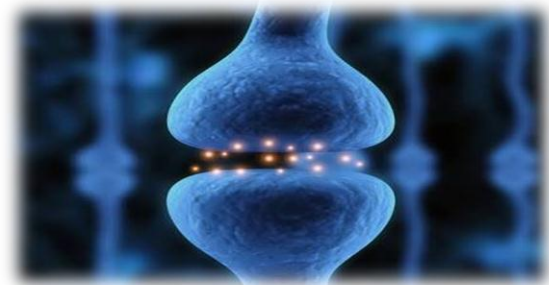

Fig [1.2] Message Transmission [3]

So we are simply deviating the path and sending the same signals in improved manner to the brain so that it can read that and proceed toward reflex actions. Plus, the quality and quantity should be somewhat less so that it could not harm the brain function and other structural part of brain.
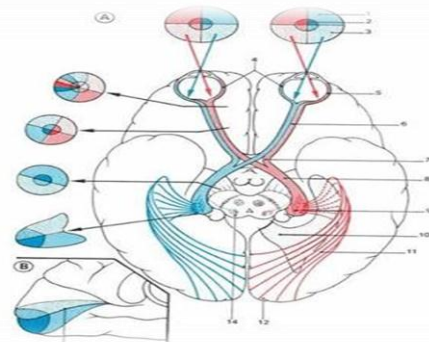

Fig [1.3] Internal Eye Vision Transmission

From Fig [1.3] we can see that signals from eye is transmitted to the specific brain part via neuron so again in this case if this path is disturbed then a person will be unable

to see it. I quite simple to understand so we through our project will give signal collected from outside directly to the specific part of the brain and obtain the result so the concerned part of visual activities in occipital region will be sent on a moderate quantity signal to this part and in a calculated manner we could obtain results although we need to be so specific that it should not disturb the other neuron functions. Moreover, this technology doesn't cause any sort of discomfort to user as it doesn't involve any sort of wear and tear.
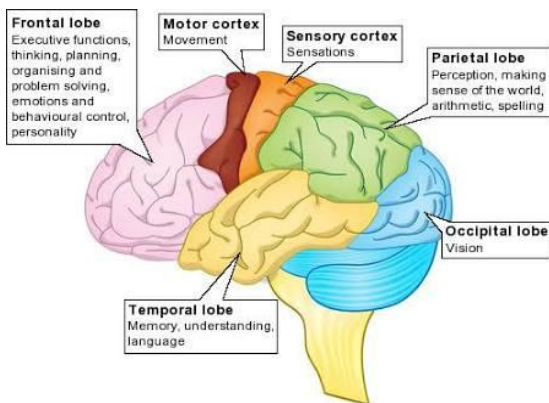

Fig [1.4] Brain Different Lobes Partition. [4]

From Fig [1.4] we can observe that there are many partitions of brain as classified below:
- Frontal Lobe: This part executes functions, thinks, plans, organizes and solves problem over many emotions handling plus this is also responsible for personality development or change.
- Motor Cortex: This part is responsible for all muscular movement of our legs, hands, fingers etc.
- Sensory Cortex: As name implies, this part is responsible for all type of sensations we face over our life period.
- Occipital Lobe: This is the main focus of the solution we supplied here, responsible for vision ability.
- Temporal Lobe: This part is very essential to remember things and is also responsible for hearing like RAM or ROM like in a PC.

With that, many different partitions of brain help one to tackle real-world problems to face and act upon. However, each and every part supplies special types of brain waves/signals through which one can take benefit and can draw on sheet of paper what a person is thinking, storing, etc.

III. METHODOLOGY

Our main concept is to transmit waves/signals from outside world to brain or vice versa through this proposed tech headset. This Headset is named as "*Star Tech*". We were wondering out on an Arduino project and suddenly we thought why we shouldn't help disabled person to come out from all disability like hearing, observing and speaking through this amazing device ARDUINO as shown in Fig [1.5].
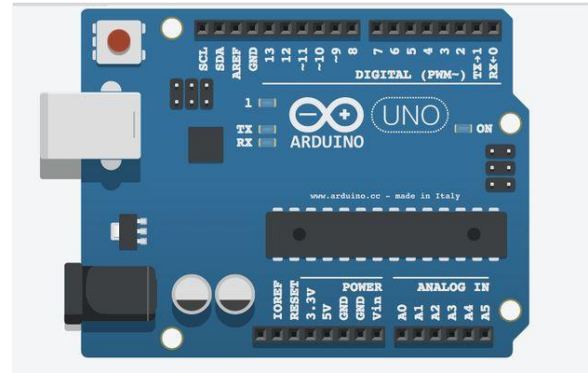

Fig [1.5] Arduino UNO

Yes, one can read brain waves coming from brain through this microcontroller and can simulate very well in software. So, why one can't help one to listen, speak and see through this device. As Stephen Hawking's Chair is a live example of that "Nothing is Impossible" and we walked upon this idea to establish a headset which will listen the brain waves or outside world waves and transmit to vice versa. This can happen by same like device that one company in US as made that is named as "Neuro Sky" [5] as shown in Fig [1.6].

Fig [1.6] A model of Neuro Sky

And, by the time we noticed this tech device, we also rose with an amazing idea to discover "Star Tech". The basic structure of this will involve below things:
- Arduino: This is a microcontroller that will control PC and brain waves to simulate waves around the person. This is similar to CPU that will perform some basic function and will return with some particular output.
- Sensors: This is the primary part of "Star Tech" which will help to read and catch internal brain waves and transmit to arduino.

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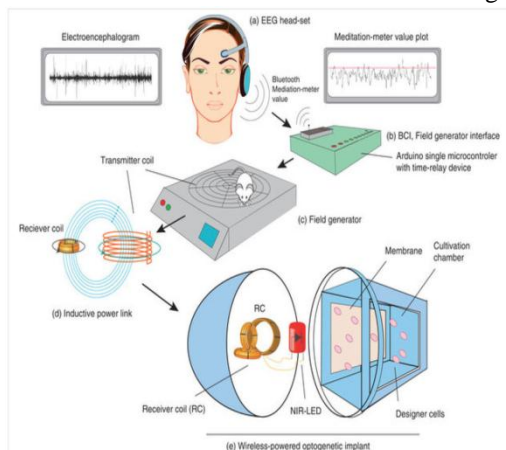The whole idea can be summarized as seen from Fig [1.7].

Fig [1.7] Summarized view of Brain Signals Synthesis

Secondly, the basic form will be as like of Neuro sky but will be handling in small size, fast in processing and help disabled one to tackle efficiently the data over his brain.

The functioning of this device would be such like below with mentioned disability:

- Hearing: Let's say there is a person with no hearing power and can't even catch a single word in his ears. The reason behind is as explained below i.e. the transmission between ears and brain is disturbed or destroyed completely. By that, one can supply external help from ears to that part of brain that is responsible for hearing and with that one can be able to tackle this type of problem.
- Speaking: Similarly, we can attach external sensor to person's throat and by which the vibrations of vocal chords will generate a waves or we can even attach this sensor to part of brain that is responsible for thinking and will convert the brain wave to audio signal giving out successful audio voice to listening person.
- Vision: With that, if we see the example of vision, one can read brain waves of Occipital Lobe which will surely generate waves and through which internally we can transmit outside scene waves to that this part.

Summing up, one can prefer Fig [1.8] where we have practically noticed speech signals which were transferred from sensor via to software on system.
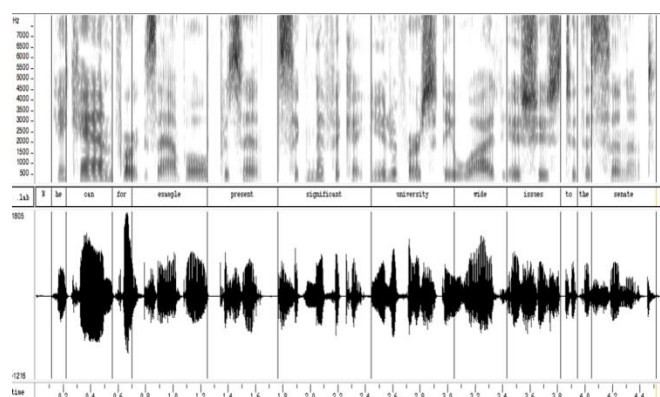

Fig [1.8] Speech Signals from brain to software.

Secondly, one can see screenshots of our made software that detects and analyzes the brain signals very easily through attached sensors on head and connected to system.
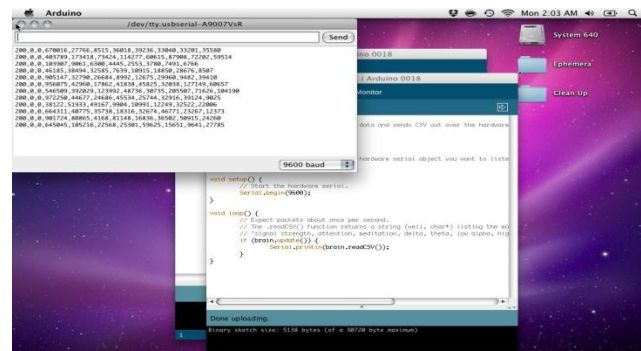

Fig [1.9] Arduino IDE with shown output screen

With all summarizing, we here proposed this wonderful concept so that our elder one, younger one who are not capable of speaking, hearing and seeing can speak, hear and see very confidently and efficiently.

However, with that this solution can also help non-disabled person too so that universal use of technology been kept worthy.

IV. RESULTS AND DISCUSSIONS

With the extent of this technology, the different applications studied in contrast as in areas of government sector or at industry level usage for reading criminal brain waves. On the peak, many hospitals from worldwide had already installed these types of device at various places for various purposes and functions like the live example we have reported that United States in the form of "Neurosky" has setup, installed, and utilized successfully at various places for various special-purposes.

V. CONCLUSIONS

Therefore, we can conclude that Start Tech can be used for small-scale purposes like in disabled schools and all as well as for private i.e. in villages where persons are facing these types of problems of hearing and speaking. In addition, the device likes this if setup successfully in much needed area will surely enable many my fellow citizens to connect their world across the world whenever applied to use.

VI. FUTURE WORK

This research paper represents one of the applications that is applied but as there is still a huge number of applications to study which can be further be taken in contrast of study and analysis. As this paper includes small non-commercial application, further study can be undergone to understand others aspects like to convert this device into large societies where its need requires by using various techniques like Nanotechnology etc. However, star tech can be studied or addition of new technology like sixth sense [11] or seventh sense can be there.

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The same technique can be use for more enhancements/applications as follows:

- Can be use for large-scale level study.
- Can be modifying by using android connectivity to this making it smart star tech.
- Security measures can study and apply thoroughly to this technique.

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