

Article

Brain to Brain Communication using Brain Computer Interface

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How to cite this article:

Bhardwaj R, Kumar D, Singh S et al. Brain to Brain Communication using Brain Computer Interface. *J Adv Res Image Proc Appl* 2020; 3(1): 19-21.

Date of Submission: 2020-02-06

Date of Acceptance: 2020-02-24

A B S T R A C T

A Brain Computer Interface (BCI) is a communication system that interprets brain signals formed from dissimilar activity into commands for a system. Deprived of doing any physical activity we can objective use our brain to give commands to the system and that will do effort for us. This movement existence commonly restrained by Electro Encephalography (EEG). We can usage this technique to generate a non-verbal communication between two or more people. BCI is one of the new investigations and experts are still try to progress it improved so that in future inactivated can effortlessly do their work. We essential to understand BCI's due to the tests regarding ethics obtainable by new expertise.

Keywords: BCI (Brain Computer Interface), Electroencephalography, Neurons, Machine Learning, MRI, Transmitter, Brain Signals

Introduction

From many years' humanoid use different methods to interconnect with each other like oral, using gestures, writing. But now the time has been changed, we human are trying to find different ways to interconnect with each other as easy as possible. We create telephones, mobile, emails and many other methods to interconnect with each other. But in all this method we need human efforts like speaking, writing etc. but what is we communicate through our brain only. That look very hard to do but now we can do it by using brain computer interface.⁴ BCI is a method in which we use our brain signal to command the system which reduce the efforts to a very huge level. We communicate with a machine using only our brain which seems to be difficult earlier but now it is very easy to do.

Brain Computer Interface

We all know that our brain uses electric signal to command the function of the body. Whenever we think or do some activity our brain create electric signals which permits through the neurons to the effective part of the body. We

have different systems to measure those signals like MRI machines uses by hospital to measure the brain activity of the patient.⁵ Similarly we amount the brain activity and waves using Electroencephalography which records the brain activity. These signals from the brain are recorded by a computer that bind a particular purpose to a particular signal. So, whenever we think the same thing then that signal will produce and our system will check for the function bind with that specific signal and if a match is found then it will create a desired output. Our system will learn different signal and bind a function to it that will create a desired output and when all done then we just wear our headset that will read the signal and sends them to the system and without any physical activity we can do physical work using our brain only.

How Brain To Brain Communication?

As we can generate a device which will convert our brain signal into commands and operate a machine. For brain to brain communiqué we need to eliminate the system from the interface technique now our headset will learn the

brain signal and create a precise message which will send to a similar device which holds the same evidence as the first one. When our brain does some activity, it creates a signal that our headset will read and check for the message bind with that signal and if a match found it will send that signal to the other device using by another person. The second device store the same info as the first one so when it received the signal it will search for the message stored in it already as both the devices are clone of each other so signal will match definitely and yield an output of that message. The same function is for the second headset it will do the same thing when person do some activity. In this manner we create a brain to brain communication and it can change the manner of human to human communication techniques. We can use BCI to not only control machines but also in brain to brain communication the concept is same but the methodology is different. The headsets will work as intermediate between the brains that translate the brain signals into messages. We need to create the headsets in that manner that the read the brain signal, learn them and send to the other.

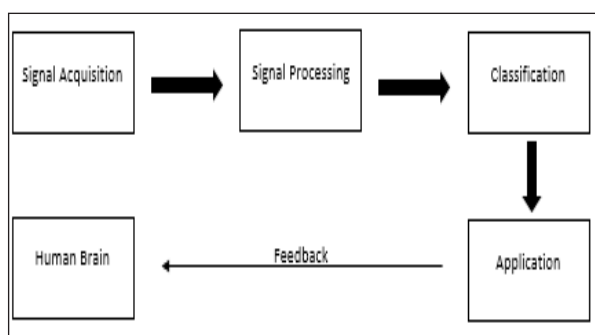


Figure 1. Building Blocks of a Brain Computer Interface

Role of Machine Learning

For the headset we need machine learning so that it learns about dissimilar signals and create a specific output. In machine learning we required data as input for the machine; here the data is in the form of signals. We need to feed signals in our headset and bind specific output for each type of signal. Here machine learning plays a very important role here as it helps us to make our headset learn the signals.

We need to sure that the learning process should complete with high accuracy so that the possibility of wrong output gets diminished. For testing we required only few types of signals but if it comes in use it required to store a large number of signals and need to bind a specific output to each signal.

Efficient for Disabled

⁶Using direct brain to brain communiqué disabled can easily interconnect direct to other person. Like if a person can't speak then using this, he can easily interconnect to others

without any sign language. A blind person also gets that what other try to show him but in hearing disability we need to add a medium like a small screen so the person can get what other trying to say him. This will be very helpful for those who can control their brain easily as BCI needs a conscious control over the brain.

Open Problems

BCI required a high amount of training as we need to feed so many signals in the device and need to attach a particular output, this will be a time taking process and we need to train the brain of the person which is going to use it. The device needs to be trained by the person so that it will be easy to use it by that person as he records the signal of its own brain but it will take too long to attach outputs to different signal.

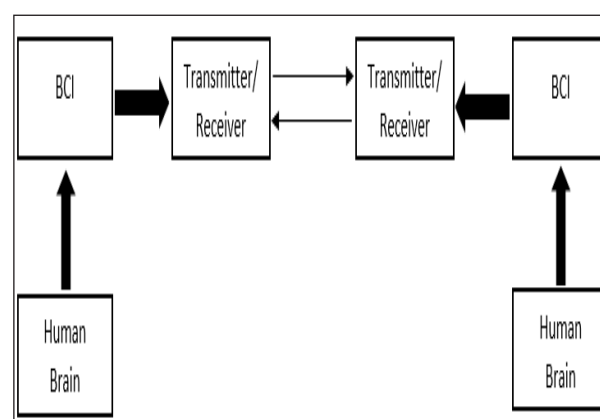


Figure 1. Building Blocks of a Brain Computer Interface

We need to attach other features also to our device like when to communicate, how it will make a connection to another device. We also require to make the device precise as our brain signal may varies be contingent on our thoughts. We need to add so many algorithms in the device which is a part of machine learning and need so many features to make a barrier less communication.

Future Scope

This will be an obligation in our future as it can eliminate the use of mobile phones, and other collaborating devices. It can help us to interconnect in those conditions where we are not able to speak or listen. It will be very useful for the disabled as they are not able to interconnect unswervingly as a normal person do but using this they can effortlessly interconnect to others.

If we intensification the range of the device then we can communicate at a very far distance unswervingly through our brain. It can be uprising in the communication as here we need not to speak or listen, we just essential to think what we neediness to convey to the other person and the brain signals will do rest of the work.

Conclusion

In this paper, we have endeavored to give an outline to brain to brain communication and have revised how BCI work and how we can use it in brain to brain communication. We conclude that we can essentially communicate through our brain only and this is quite easier than it seems. We requirement to create a device that will read, store, transmit and receive information and using that we can interconnect.

As the research on BCI had already done and we see so many devices using which a person interconnects to a machine. It obligatory a small alteration in the device so that it interconnect to other.

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