

# A Review on Brain to Brain Communication Using Brain Computer Interface

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## ABSTRACT

A Brain Computer Interface (BCI) is a communication system that translates brain signals produced from different activity into commands for a system. [1]Without doing any physical activity we can just use our brain to give commands to the system and that will do work for us. [2]This activity being generally measured by Electroencephalography(EEG). We can use this method to create a non-verbal communication

## I. INTRODUCTION

From many years human use different methods to communicate with each other like oral, using gestures, writing. But now the time has been changed, we human are trying to find different ways to communicate with each other as easy as possible. We create telephones, mobile, emails and many other methods to communicate with each other. But in all this methods we need human efforts like speaking, writing etc. but what if 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 (BCI)

We all know that our brain use electric signal to command the function of the body. Whenever we think or do some activity our brain create electric signals which passes through the neurons to the effective part of the body. We have different techniques to measure those signals like MRI machines uses by hospital to measure the brain activity of the patient. [5]Similarly we measure 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 function to a

between two or more people. BCI is one of the recent research and scientists are still try to develop it better so that in future disabled can easily do their work. [3]We need to understand BCI's due to the challenges regarding ethics presented by new technology.

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

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 particular 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 create a device which will convert our brain signal into commands and operate a machine. For brain to brain communication we need to remove the system from the interface method now our headset will learn the brain signal and create a specific message which will send to a similar device which holds the same information as the first one. When our brain do some activity it create 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 information 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 produce a 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 intermediater 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.

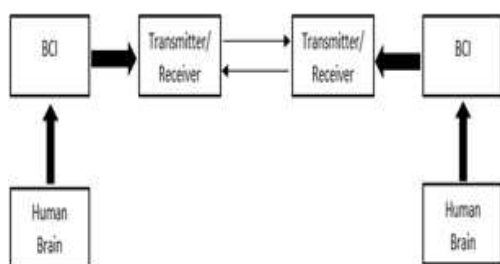


Fig. Block dig. of brain to brain communication

### ROLE OF MACHINE LEARNING

For the headset we need machine learning so that it learn about different 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 play a very important role here as it help 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 get 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.

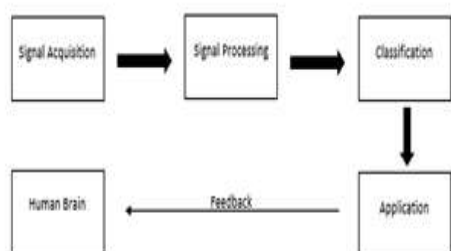


Fig. Building blocks of a brain computer interface

### EFFICIENT FOR DISABLED

[6]Using direct brain to brain communication disabled can easily communicate

direct to other person. Like if a person can't speak then using this he can easily communicate to others without any sign language. A blind person also get 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

[7]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 need 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.

We need to attach other features also to our device like when to communicate, how it will make a connection to other device.

We also require to make the device accurate as our brain signal may varies depend on our thoughts. [8]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 a requirement in our future as it can remove the use of mobile phones, and other communicating devices. It can help us to communicate 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 communicate directly as a normal person do but using this they can easily communicate to others.

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

### II. CONCLUSION

In this paper we have attempted to give an introduction to brain to brain communication and have reviewed how BCI work and how we can use it in brain to brain communication. We conclude that we can actually communicate through our brain only and this is quiet easier than it seems. We need to create a device that will read, store,

transmit and receive information and using that we can communicate.

[9]As the research on BCI had already done and we see so many devices using which a person communicate to a machine. It required a small modification in the device so that it can communicate to other.

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