# Brain Computer Interface Techniques for Physically Challenged People

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**Abstract – Blind and deaf people can communicate in the real time world. Vibrating bracelet and neurosky mindwave is used for the physically challenged people. By using vibrating signal blind can able to identify the sensation. And also by using electroencephalogram we can identify the waveform of deaf.**

**Index Terms – Neurosky,Vibrating bracelet,EEG,UART,DMA** .

## 1. INTRODUCTION

Now a days an electronic device plays a important role for physically people.There are many visually impaired people using signals and waveform blind and deaf people can communicate suitable for both indoor and outdoor environment.For blind deaf people electronic components with low power and vibrating signals are used.Less complicated hardware is implemented embedded software can provide a way for battery life.To create a software debugging is used, firmware is used to write in the software.Power consumption and changes in the code are developed in this software.Based on DC converter it can operate in the debuging cycles.Disability people can express their thoughts based on brain computer interface.Muscles and speech can provide a communication between the brain computer interfcae.In general living beings have five senses based on that we can identify the visual data.Rods are involved in the eye contact.Due to amyotropic lateral sclerosis cannot express their own thoughts.Elecrocencephalogram technique provide a process and translation of signals from brain activity into machine code.BCI can divided into two categories Invasive and NonInvasive.Invasive use the sensor with high density inside the brain signal.NonInvasive have EEG based brain computer interface for the brain to place the electrodes in scalp. Electrical signals can be predicted and display the output.

## 2. METHODOLOGY

There are two phases for a blind people

1)Vibrating signal

Vibration motor is used to identify the threshold values.Impulse modulation is used to detect the obstacle for a visually impaired people vibration strength based on the switching frequency.Six motors and multipoint vibration is suitable for obstacle vibration.Microcontroller can debug the cycle in the vibrating bracelet interface Energy modes DMA are used in vibration signal with rechargable battery.

2)Bracelet Interface

Brain computer interface can tactile the communication between human and machine. Human brain is highly complex so, we transfer the data slowly. A device with multipoint vibrating bracelet are used for various applications. Based on a UART interface we can communicate with the device and on the mobile phones.

There are two phases for deaf people

1) Detection of electrodes

Cyclic behavior of data not numerical. Data is from a study of sleep state .

qt-Quiet sleep, trace bracelet

qh-Quiet sleep, high voltage

tr-Transitional sleep

ah-active sleep, high voltage

aw-awake

To place the electrodes we are in need of 10-20 system in the location of scalp. And the 10-20 refers to the actual distance between adjacent electrodes are either 10% or 20% front, back or right left of the skull. Each site has a letter identify the lobe and numbers to identify the hemisphere location. The alphabetical letters F, T, C, P and O stands for frontal, temporal, central, parietal and occipital lobes. The letter C is used for identification purpose. Even numbers(2, 4, 6, 8) refer to an electrode position on the right hemisphere. Odd numbers(1, 3, 5, 7) refer to the left hemisphere. Z(zero) refers to midline.

2) Identification of waveform

Waves are classified based on both frequency and shape

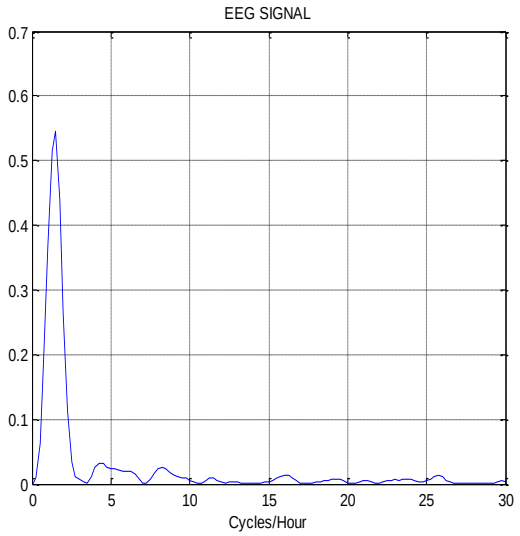
Beta wave: Brain is active when beta waves are released.13HZ and 30HZ waves of frequency.

Alpha wave:Brain is in a relaxed state if the frequency is between 8HZ and 13HZ. Mindless state or empty state alone rather than a passive state. This wave reached into the left side.

Theta wave:Brain is in emotional tension , stress, frustration. If the frequency is between 4HZ and 7HZ.

## 3. TEST AND RESULTS

EEG graph signal for deaf people. For Blind six vibrating points determine the vibration location. Every user has an indication pattern and vibrating motors. Vibration signal strength pattern distance alerts can customize the user friendly level. And to locate the signal, vibration or multisource is simple. If a user feels comfortable bracelet signals quickly realizes and start the real time test. The user can respond based on the alert and obstacles.




## 4. CONCLUSION

Based on the brain computer interface blind and the deaf can interact with people. The detection of EEG and rectify the problem of deaf people, with the waveform signal it can be identified. The Blind can sense the vibration signal and identify the communication and other signals.

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