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A Project Report on

Sound Therapy to cure Neural Disorders

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ABSTRACT

To cure neurological disorders of the brain using innovative sound techniques using binaural beats can be used. This project is aimed to study the effects of different binaural beats on people with mild to severe neural disorders. This technology is aimed to help autistic people and those with other neuro-sensory disorders in order to increase their mental capacity, to accelerate the learning abilities, to improve memory, to enhance concentration, improve in the ability to relax, overall reduction of stress and many other benefits. This project compares the brain activity in the individual before and after receiving sound therapy in order to understand the positive effect which the sound has on the brain. The brain activity is measured using an Electroencephalogram (EEG).

When different frequencies are simultaneously played through right and left channels of stereo headphones they create what is referred to as binaural beats within the brain. For example, if frequencies of 30 and 40 Hertz are played in the right and left ears respectively, 10 and 70 Hertz binaural beats are created. In other words, the difference between and the sums of the frequencies played into each ear create electrical signals within the brain. These self generating signals occur whenever the two hemispheres of the brain work together.

We can use an EEG Headset to record the brain activity. EEG data is received in the PC and used to study the brain activity. Recent EEG devices consist of the number of accurate electrodes, amplifiers for each electrode followed by filters. Analog EEG signals are needed to be converted to digital data and sampling frequency is limited to catch up with the speed of the conversation on ADC. There are low pass and high pass filters to remove unwanted frequencies. The data is recorded and used in MATLAB to work with. The EEGLAB is a rich toolbox for MATLAB to process EEG data.