

## Documents

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**Emotion recognition using electroencephalogram signal**

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**Abstract**

Emotion play an essential role in human's life and it is not consciously controlled. Some of the emotion can be easily expressed by facial expressions, speech, behavior and gesture but some are not. This study investigates the emotion recognition using electroencephalogram (EEG) signal. Undoubtedly, EEG signals can detect human brain activity accurately with high resolution data acquisition device as compared to other biological signals. Changes in the human brain's electrical activity occur very quickly, thus a high resolution device is required to determine the emotion precisely. In this study, we will prove the strength and reliability of EEG signals as an emotion recognition mechanism for four different emotions which are happy, sad, fear and calm. Data of six different subjects were collected by using BrainMarker EXG device which consist of 19 channels. The pre-processing stage was performed using second order of low pass Butterworth filter to remove the unwanted signals. Then, two ranges of frequency bands were extracted from the signals which are alpha and beta. Finally, these samples will be classified using MLP Neural Network. Classification accuracy up to 91% is achieved and the average percentage of accuracy for calm, fear, happy and sad are 83.5%, 87.3%, 85.83% and 87.6% respectively. Thus, a proof of concept, this study has been capable of proposing a system of recognizing four states of emotion which are happy, sad, fear and calm by using EEG signal. © 2019 Institute of Advanced Engineering and Science. All rights reserved.

**Author Keywords**

EEG; Electroencephalogram; Emotion

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