

Analysis of EEG Features for Brain Computer Interface Application

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Abstract:

Brain-Computer Interface (BCI) or Human-Machine Interface (HMI) is now becoming vital engineering and technology field which applies electroencephalography (EEG) signal to provide Assistive Technology (AT) to humans. This paper presents the analysis of EEG signals from various human cognitive or mental states to determine the suitable EEG features that can be employed in BCI field. Here, EEG features in term of power spectral density, log energy entropy and spectral centroid are selected to recognize human mental or cognitive state from 3 different exercises; i) solving math problem, ii) playing game and iii) do nothing (relax). The average power spectral density, average log energy entropy and average spectral centroid of EEG Alpha and Beta band for three mental exercises are calculated in order to determine the best features that can be used for BCI application. The results of the research shows that the EEG features in term of power spectral density, log energy entropy and spectral centroid can be used to indicate the change in cognitive states after exposing human to several cognitive exercises.

Keywords : Brain-Computer Interface (BCI); Electroencephalography (EEG); EEG Feature; Power Spectral Density (PSD)

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