Acquisition and Pre-Processing of the EEG Signal based on Motor Activities

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At nowadays the person suffering from upper amputee is increased they face several issues in day-to-day life. To provide a rehabilitation to them in this study the electro encephalographic signals are acquired and features are extracted from the different subjects by performing several motor actions to find the deviation in the EEG signal at several motor action states. In this study EEG signal is acquired from the five different subjects at six different states. Different states at which signal acquired in this study are resting, writing, typing, grasping, lifting and punching these are the general activities that are carried out by every normal person. All the acquired EEG signals are pre-processed using the band pass filter to denoise the noises present in the acquired EEG signal. Filtered EEG signal is smoothened using the mean average smoothening method which is used to remove the minute noises present in the filtered EEG signal. The deviations in the parameters of the acquired EEG signal at the state of different motor actions are clearly shown in this study. The parameters of the pre-processed EEG signals are extracted in this study.

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Contents

I. Introduction

EEG is termed as the electro encephalographic signal which is used to measure the electrical activity of the brain while performing various activities. The EEG signals are acquired from the subject by placing the electrodes at the hemispherical region of the subject. In this study the EEG signal is acquired from the subject by providing various motor activities. The motor activities are stimulated by the muscles at the time when they receive motor nerve signal from the brain for the particular action. In this study the motor nerve signal for the various types of upper limbs motor activities are recorded and pre-processed. These motor nerves are the nerves that carries the messages of actions in the form of response from the brain to the particular muscle to do particular action. The action of response is carried in the form of electrical potential from the brain to the particular muscle. In this study the motor nerve signals for the upper limbs are acquired and preprocessed. The motor nerve signals for the upper limbs are acquired from the subject by placing the electrodes at the frontal lobe of the subject. The noises in the acquired EEG signals are removed using the band pass filter. All the acquired signals are pre-processed using the advanced IIR filter. The most vital parameters of the motor nerve signal are extracted from the pre-processed EEG signal for the various motor activities. In this study the basic features of the EEG signals are extracted from the pre-processed EEG signals.

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