

Machine Learning Algorithms for Epileptic Seizure

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Abstract

Epileptic seizure is a brain deregulation episode. This brain deregulation can be diagnosed by using different machine learning algorithms, such as k-Nearest Neighbor and Support Vector Machines. Researchers have proposed recognition of epileptic seizure with artificial neural network (ANN) algorithms. The wearable device of electroencephalogram (EEG) was used in a study conducted to the neurology department of a hospital for the prediction of epileptic seizures. EEG data set represents of signals belong to healthy and epileptic patients. EEG signals show information for the frequency and are separated into α , β , δ , θ spectral components and provide a range of frequency components. EEG spectrum contains some characteristic waveforms with four frequency bands. These are δ (0.5-4 Hz), θ (4-8 Hz), α (8-13 Hz), β (13-30 Hz). The frequency components of the EEG are extracted by using the discrete wavelet transform (DWT), which is a method of frequency analysis. Coefficients of wavelet transform are used for the recognition of epileptic seizures in EEG signals. Then these are applied as inputs for different machine algorithms, such as (ANN). By placing electrodes to the patient's head we can get EEG data from him. The frequency of the EEG makes EEG curves that show the activation with the time parameter. In the end, EEG signals are analyzed, find potential epileptic seizures and send notices to the patient's mobile phone.