

عنوان مقاله:

Epileptic Electroencephalogram Classification using Relative Wavelet Sub-Band Energy and Wavelet Entropy

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خلاصه مقاله:

Epilepsy is one of the common neurological disorders which can cause unprovoked seizures. Currently, diagnosis and evaluation are carried out using electroencephalogram (EEG) signal analysis, which is performed visually by clinicians. Since EEG signals tend to be random and non-stationary, the visual inspection often provides misrepresentation of results. Numerous studies have been proposed computer-based analysis for epileptic EEG classification; however, there is still a gap to improve detection accuracy with a small number of features. Therefore, in this study, we proposed an automatic detection protocol for epileptic EEG classification. The proposed methods are relative wavelet energy and wavelet entropy for feature extraction and combined with the classifier method for automatic detection. In this study, three classes of EEG consisted of pre-ictal, ictal, and interictal were used as test data and also evaluate the proposed method. EEG signals were decomposed using wavelet transform into five conventional sub-bands, including gamma, beta, alpha, theta, and delta. The relative energy and entropy were then calculated in each of these bands as a feature set. These methods are chosen with consider of low-cost computing. We tested the performance of our feature extraction method using Support Vector Machine (SVM), both linear and non-linear kernels. From the simulation, the highest accuracy was ۸۰-۹۶.۷% for ictal vs. pre-ictal, ictal vs. inter-ictal, pre-ictal vs. inter-ictal, and ictal vs. non-ictal. Finally, this work was expected to help clinicians in the detection of .epilepsy onset based on EEG signals

کلمات کلیدی:

Epilepsy, Electroencephalogram, Entropy, Wavelet Energy

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