Automatic Seizure Detection Using Weighted Permutation Entropy and Support Vector Machine

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Abstract : The automated epileptic seizure detection research field has emerged in the recent years; this involves analyzing the Electroencephalogram (EEG) signals instead of the traditional visual inspection performed by expert neurologists. In this study, a Support Vector Machine (SVM) that uses Weighted Permutation Entropy (WPE) as the input feature is proposed for classifying normal and seizure EEG records. WPE is a modified statistical parameter of the permutation entropy (PE) that measures the complexity and irregularity of a time series. It incorporates both the mapped ordinal pattern of the time series and the information contained in the amplitude of its sample points. The proposed system utilizes the fact that entropy based measures for the EEG segments during epileptic seizure are lower than in normal EEG.