An Analysis system detecting epileptic seizure from EEG

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Abstract

This paper presents an analysis system for detecting epileptic seizure from electroencephalogram (EEG). As EEG recordings contain a vast amount of data, which is heterogeneous with respect to a time-period, we intend to introduce a clustering technique to discover different groups of data according to similarities or dissimilarities among the patterns. In the proposed methodology, we use K-means clustering for partitioning each category EEG data set (e.g. healthy; epileptic seizure) into several clusters and then extract some representative characteristics from each cluster. Subsequently, we integrate all the features from all the clusters in one feature set and then evaluate that feature set by three well-known machine learning methods: Support Vector Machine (SVM), Naive bayes and Logistic regression. The proposed method is tested by a publicly available benchmark database: 'Epileptic EEG database'. The experimental results show that the proposed scheme with SVM classifier yields overall accuracy of 100% for classifying healthy vs epileptic seizure signals and outperforms all the recent reported existing methods in the literature. The major finding of this research is that the proposed K-means clustering based approach has an ability to efficiently handle EEG data for the detection of epileptic seizure.