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Epileptic seizure detection based on linear features coupled with machine learning

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Detecting epileptic seizures in EEG signals using transformation techniques, such as a wavelet transform, Fourier transform or hybrid transform could not give the promising results as EEG signals have a nonstationary and nonlinear nature. In this paper, a novel technique based graphs domain is designed. The dimensionality of each single EEG channel is reduced using a segmentation technique. Each EEG channel is then mapped into an undirected weighted graph. A set of structural and topological graph characteristics is extracted and investigated. Several machine learning techniques are utilized to categorize the graphs attributes. Based on the obtained results, it is found that the use of graphs improves the quality of epileptic seizures detection. The proposed method can identify the abnormities happened in EEG, which are difficult to be identified accurately using other transformation techniques, especially when dealing with EEG big data.

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