

A robust framework epileptic seizures classification based on lightweight structure deep convolutional neural network and wavelet decomposition

ABSTRACT

Nowadays scientific evidence suggests that epileptic seizures can appear in the brain signals minutes and even hours prior to their occurrence. Advances in predicting epileptic seizures can promise a robust model in which seizures and irreparable injuries at the time of occurrence can be possible. Most of the previous automated solutions are associated with challenges such as the lack of a proper signal descriptor, the existence of a large number of features and, consequently, the time-consuming analysis, which are not considering the uncertainty issue. In this paper, efficient and fastidious classification is performed by analysing the frequency bands of the input EEG signal via discrete wavelet transform, which is relying on the deep convolutional neural network based classification. Using the EEG signals obtained from the CHEGMIT Scalp EEG database, the implementation in the desired model is performed and the results show that the proposed model has the best response in detecting the disease from the sample signal and with the highest level of certainty to follow. To solve the uncertainty problem, the repeatability algorithm test is arranged and after K-fold cross-validation, the experimental precision of all the three evaluation factors were equal to 99.34%, 99.53%, and 99.76%, respectively.