Development of Early Prediction Model for Epileptic Seizures

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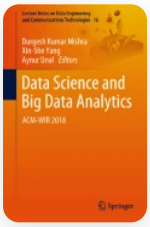

Data Science and Big Data Analytics

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Abstract

Epilepsy is the neurological disorder of brain electrical system causes the seizure because of that the brain and body behave abnormally (Yadollahpour, Jalilifar, Biomed Pharmacol J 7(1):153–162, 2014) [1]. Epilepsy is the result of recurrent seizure, i.e., if the person has single seizure in their whole lives then that person is not affected by epilepsy but if that person has more than two seizures in their lives then that person is affected by Epilepsy. Near about 0.8–1% of population all over the world is affected by an epilepsy, epilepsy is

not able to cure but able to controlled by using anti epileptic medicine or by performing resective surgery then also in 25% epileptic patients no present therapy is used to controlled the epilepsy. Epilepsy is unpredictable in nature so it increases the risk of end dangerous accident when person work with heavy machineries like driving a car, cooking or swimming, again a patient always have fear of next seizure it really affect on their daily lives so to minimize the risk and to improve the quality of life of such patient it is necessary to predict the epilepsy before its onset. In the present study by using 21 patients EEG database which consist of 80 seizure, learn the 336 predictive model using four different classifier, i.e., ANN, KNN, MC-SVM using 1-against-1 approach and MC-SVM using 1-against-all approach and make possible to predict epilepsy 25 min before onset with the maximum average accuracy 98.19% and sensitivity 98.97% and predict 30 min before onset with the average maximum accuracy 98.04% and sensitivity of 98.85%.

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