عنوان مقاله:

Identification The Dynamic of ECoGs of WAG/Rij in Transition From Preictal to Epileptic Seizures

محل انتشار:

هشتمین کنفرانس بین المللی نوآوری و تحقیق در علوم مهندسی (سال: 1399)

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خلاصه مقاله:

Epilepsy is a common neurological disorder with a prevalence of 1% of the world population. Absence epilepsy is a form of generalized seizures with Spike wave discharge in EEG. Epileptic patients have frequent absence seizures that cause immediate loss of consciousness. In this study, it has been tried to explore whether EEG changes can effectively detect epilepsy in animal model applying non-linear features. To predict the occurrence of absence epilepsy, a long-term EEG signal has been recorded from frontal cortex in seven Wag/Rij rats. After preprocessing, the data was transferred to the phase space to extract the brain system dynamic and geometric properties of this space. Finally, the ability of each features to predict and detect absence epilepsy with two criteria of predictive time and the accuracy of detection and its results were compared with previous studies. The results indicate that the brain system dynamic changes during the transition from free-seizure to pre-seizure and then seizure. Proposed approach diagnostic characteristics yielded 97% accuracy of absence epilepsy diagnosis indicating that due to the nonlinear and complex nature of the system and the brain signal, the use of methods consistent with this nature is important in understanding the dynamic transfer between different epileptic seizures.

کلمات کلیدی:

Absence Epilepsy, WAG/Rij, Electrocorticography, chaos, Phase Space, Nonlinear Attractor, Geometric Properties.