

عنوان مقاله:

Evaluating the NARX and ELMAN for the Modeling of Epileptic EEG Signal

محل انتشار:

سومین همایش بین المللی التهاب سیستم عصبی و سومین فستیوال دانشجویی علوم اعصاب (سال: 1398)

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خلاصه مقاله:

The epilepsy can cause anaesthesia or seizures in peoples with epilepsy because of the Creating of heterogeneity in the pattern of neuronal activity that it is different in terms of being local or general. In the procedure of cure and choosing an effective way to control and betterment of the sickness, the EEG modeling can have a crucial role. Using the neural networks is one of the greatest Computational intelligence tools for the modeling of chaotic and non-linear signals which is used as the main target of this article. Materials and Methods: The purpose of this article is to evaluate two recurrent ELMAN and NARX neural networks for modeling the EEG signal. These two neural networks have been evaluated using complex modeling and predictive time series estimation. The data used in this research were obtained from the surface electrodes, Deep electrodes and strip electrodes in normal state, before seizure and during an epileptic seizure which categorized in to two healthy and epileptic groups. White noise is used as input for the modeling of EEG signal using NARX and in the ELMAN modeling, previous inputs are applied as input for the neural network. The benchmark for this project was MSE and Fitness. Results: The modeling of the EEG signal using ELMAN neural network had a precision of 82% and a sensitivity of 83%. On the other hand, the NARX neural network resulted a 96% precision and 95% sensitivity. The epoch number is a parameter for evaluating the processing speed in neural network which were greater in NARX neural network. Conclusion: The NARX neural network achieved a higher precision and lower errors which concludes a better performance rather than ELMAN neural network in modeling the Epileptic EEG signal. Also, this neural network can be used in chaotic systems as a controller. This effective modeling that is done by NARX neural network can help sick people in predicting and controlling the seizures and also in determining the dose of their medicine

کلمات کلیدی:

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