

## Analysis of Brain Signals Using Neural Networks Optimized by Co-Evolution Algorithms

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**Abstract :** Up to 40 years ago, after recognition of epilepsy, it was generally believed that these attacks occurred randomly and suddenly. However, thanks to the advance of mathematics and engineering, such attacks can be predicted within a few minutes or hours. In this way, various algorithms for long-term prediction of the time and frequency of the first attack are presented. In this paper, by considering the nonlinear nature of brain signals and dynamic recorded brain signals, ANFIS model is presented to predict the brain signals, since according to physiologic structure of the onset of attacks, more complex neural structures can better model the signal during attacks. Contribution of this work is the co-evolution algorithm for optimization of ANFIS network parameters. Our objective is to predict brain signals based on time series obtained from brain signals of the people suffering from epilepsy using ANFIS. Results reveal that compared to other methods, this method has less sensitivity to uncertainties such as presence of noise and interruption in recorded signals of the brain as well as more accuracy. Long-term prediction capacity of the model illustrates the usage of planted systems for warning medication and preventing brain signals.

**Keywords :** co-evolution algorithms, brain signals, time series, neural networks, ANFIS model, physiologic structure, time prediction, epilepsy suffering, illustrates model

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