Abstract

The aim of this paper is to develop the classification system using Artificial Neural Network for Electroencephalogram (EEG) signals. A good standard traditional method is to use Electroencephalogram for diagnosing patients brain functioning that corresponds to epilepsy and different brain disorders. This research focused on designing new classification techniques for single channel EEG recordings. This work proposes three classification techniques namely Back propagation feed forward neural networks (BPFFNN) with different training algorithms, Radial Basis Function Neural Network (RBFNN) and Particle swarm optimization (PSO) based neural network to classify from EEG signals whether a person is epileptic or nonepileptic. The
first aspects of proposed work is to extract the features from EEG signals based on statistical measures and evaluate the neural networks architecture with various numbers of hidden neurons to reduce the complexity of the system. Feed forward neural networks have trained using different learning algorithms. Particle swarm optimization techniques proposed with optimal parameters to train the feed forward neural network. The performance of proposed method has compared with other commonly used classification techniques. The BPLM, RBFNN and PSONN provide very promising and practical results and required much less time and memory resources and improved classification accuracy and generalization. This study based on EEG benchmark database and it is publically available source.

References

A Comparative Performance Analysis of Artificial Neural Networks and Particle Swarm Optimization based Classification System using Electroencephalogram Signals


Index Terms

Computer Science
Artificial Intelligence

Keywords
Back Propagation Neural Network (bpnn) Radial Basis Function (rbfnn)
Electroencephalogram (eeg)
Artificial Neural Network (ann)
Epilepsy
Particle Swarm Optimization (pso)