Comparison of Differential Evolution and Back-propagation Algorithms at Training Neural Network

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Abstract

In data mining, multilayer feed-forward networks are one of the most used neural networks in various domains because of their universal approximation capability. Back-propagation (BP) uses two phases, feed-forward and back-propagate, for learning the weights in the network and training multilayer feed-forward network.The main disadvantage of the back-propagation algorithm is its convergence rate is slow and it is always being trapped in local minima. Differential evolution (DE) algorithm is a population based algorithm like genetic algorithms using similar operators; crossover, mutation and selection. In this paper, the performance of DE algorithm is compared to BP algorithm. From the experimental results, it was observed that the accuracy of DE is better than BP.This paper evaluates the performance of two algorithms by using hold out validation method and then shows the comparison results with bar chart. IRIS, breast cancer and wine data set from UCI - University of California at Irvine (Machine Learning Repositories and Domain Theories) is applied for classification. This paper is implemented by using netbean with java programming language.