



A Hierarchical Genetic Algorithm Coding for Constructing and Learning an Optimal Neural Network

Imen Ben Omrane* and A. Chatti

*Institut National des Sciences Appliquees et de Technologie INSAT, Centre Urbain Nord BP
676 - 1080 Tunis Cedex, Tunisie*

Received: April 28, 2009; Revised: July 17, 2010

Abstract: Neural Networks (NN) proved to be a powerful problem solving mechanism with great ability to learn. The success and speed of training is based on the initial parameter settings such as architecture, initial weights, learning rates and others. The most used method of training Neuron Networks is the back propagation of the gradient. Although this method provides a global optimal solution in a reasonable time, it can converge towards local minimum, in addition to large number of parameters that should be fixed previously. Within this framework of study, we propose a new coding for a hierarchical genetic algorithm for the determination of the structure and the training of the Neuron Networks. These algorithms are known for structures' and parameters' optimization. We will prove that Hierarchical genetic algorithm can improve the result of backpropagation of gradient.

Keywords: *hierarchical genetic algorithms, neural networks, backpropagation algorithm, learning, multilayer perceptron, optimization.*

Mathematics Subject Classification (2000): 93A13, 92B20.