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VI Brazilian Symposium on Neural Networks (SBRN'00) p. 24

Adaptation of Parameters of BP Algorithm Using Automata

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Abstract

Backpropagation (BP) algorithm is a systematic method for training multilayer perceptron (MLP) networks. Despite of the many successful applications of backpropagation, it has many problems, it may require a long time to train the networks, and it may not terminate. This time can be the result of the non-optimal parameters. It is not easy to choose the optimal parameters for a particular problem. In this paper, by interconnection of fuzzy learning automata (FLA) to the feedforward neural networks, we apply learning automata (LA) to adjust these parameters based on the observation of random response of the network. The main motivation in using learning automata as an adaptation algorithm is to achieve global optimization when dealing with multi-modal surface. The feasibility of this method is shown through simulations on three learning problems: exclusive-or, encoding, and character recognition. The simulation results show that the adaptation of these parameters not only increases the convergence rate of learning but it increases the likelihood of escaping from the local minima.

Additional Information

Index Terms- Neural Network, Backpropagation, Learning Automata, Morphological Learning Automata, Steepness Parameter

Citation: Hamid Beigy, M.R. Meybodi, "Adaptation of Parameters of BP Algorithm Using Learning Automata," *sbrn*, p. 24, VI Brazilian Symposium on Neural Networks (SBRN'00), 1999.

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