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Experimentation on Learning Automata Based Methods for Adaptation of BP Parameters (2008)

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Abstract

The backpropagation learning algorithm has number of parameters such learning rate (η), momentum factor (α) and steepness parameter (λ). whose values are not known in advance, and must be determined by trail and error. The appropriate selection of these parameters have large effect on the convergence of the algorithm. Many techniques that adaptively adjust these parameters have been developed to increase speed of convergence. A class of algorithms which are developed recently uses learning automata (LA) for adjusting the parameters η, α, and λ based on the observation of random response of the neural networks. In earlier papers the effectiveness of LA based algorithms using problems such as encoding problem, symmetry problem, parity problem, XOR problem, etc., were examined. In this note we test the LA based methods on more realistic problems including classification of sonar signals, vowel recognition, printed farsi digit recognition, and printed farsi character recognition. It is demonstrated through simulation that LA based schemes comparing to other schemes such as SAB,Super SAB, and ASBP method have higher performance. The result of simulations approves of the claim made in other articles that learning automata is a good tool for designing parameter adaptation methods for neural networks.

Publication details

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