Performance Evaluation of Neural Network Algorithm using Evolutionary Algorithm

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Abstract

Neural network algorithms are widely used for pattern recognition, classification, prediction purposes. Even a simple neural network with the Backpropagation learning algorithm can be an effective tool for such problems. Although this algorithm is very useful, it has weaknesses. One of this weaknesses is that the parameterization of the algorithm is not automatic. The good choice for the number of layers, the number of neurons, the activation function and other parameters must be set for every problem we want to solve with it. Many times this is not an easy and obvious task. Evolutionary algorithms are known to be able to find optimal or good parameter values from the given multidimensional parameter space. Beside the possible automatic way for searching for the best parameter values, an evolutionary algorithm can also help to solve an other weakness of our neural network algorithm. This other weakness is that the learning process can sometimes get stuck in a local optima and not learning further, so that it will not reach the best valus which are possible in the given neural network architecture. Both the neural network and the evolutionary algorithms require much computing power so even adaptive or meta evolutionary algorithm can be used to optimize the evolution progress.

Keywords: neural network, evolutionary algorithm

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