Rules extraction from constructively trained neural networks based on genetic algorithms

Marghny H. Mohamed

Abstract:

Abstract. The application of neural networks in the data mining has become wider. Although neural networks may have complex structure, long training time, and the representation of results is not comprehensible, neural networks have high acceptance ability for noisy data, high accuracy and are preferable in data mining. On the other hand, It is an open question as to what is the best way to train and extract symbolic rules from trained neural networks in domains like classification. In this paper, we train the neural networks by constructive learning and present the analysis of the convergence rate of the error in a neural network with and without threshold which have been learnt by a constructive method to obtain the simple structure of the network. The response of ANN is acquired but its result is not in understandable form or in a black box form. It is frequently desirable to use the model backwards and identify sets of input variable which results in a desired output value. The large numbers of variables and nonlinear nature of many materials models that can help finding an optimal set of difficult input variables. We will use a genetic algorithm to solve this problem. The method is evaluated on different public-domain data sets with the aim of testing the predictive ability of the method and compared with standard classifiers, results showed comparatively high accuracy.

Keywords:
Neural networks, Genetic algorithms, Data mining classification, Rules, Learning, Convergent, Comprehensible

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