A genetic-based backpropagation neural network for forecasting in time-series data

Abstract

In this paper, a comparison of two network traffic activities prediction models will be presented, namely a backpropagation neural network (BPNN) and a genetic algorithm based backpropagation neural network (GABPNN). A backpropagation neural network (BPNN) prediction model can be used to learn a time-series dataset. However, the performance of the BPNN can be improved by optimizing the BPNN using a genetic algorithm. This paper outlines a network traffic prediction model that is developed using a typical backpropagation neural network (BPNN) coupled with a genetic algorithm (GA). The performance of the GABPNN is measured by using a statistical analysis, namely Mean of Square Error (MSE). The results show that the MSE value of GABPNN obtained was lower with the population size of 400, crossover probability was 0.01, uniform mutation probability was 0.8, and 50 iterations. Therefore, the obtained results of the GABPNN model illustrates that the proposed model GABPNN has improved the prediction accuracy compared to the traditional BPNN model.