ABSTRACT

This dissertation develops a forecasting algorithm using the search and optimization features of genetic algorithms (GAs). The proposed genetic forecasting algorithm combines the powerful search of GAs and their capability to learn about pattern-relationships of past data in order to forecast future values. The genetic forecasting algorithm consists of two steps: the forecasting and the learning steps. GAs are used in the forecasting step to estimate parameters of the problem domain. The pattern learning is taken into account in the algorithm to capture the pattern relationship of learning data. The fitness function of the selection mechanism is defined by minimizing the fitness function in which the errors from both the genetic forecasting and the pattern learning steps are taken into account.

The effectiveness of the proposed genetic forecasting algorithm is examined by application to two applications domains: commercial banks deposit forecasting and bankruptcy prediction. Results of computer simulation show the accuracy in forecasting commercial banks deposit model. In addition, the proposed algorithm has better forecasting performance as compared to traditional forecasting methods. In bankruptcy prediction model, the results of computer simulation show the predictive ability of the proposed algorithm which has better classification ability than the traditional methods for classifying bankrupt and nonbankrupt firms.