

## **Methaheuristic Bat Algorithm in Training of Feed-Forward Neural Network for Stock Price Prediction**

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**Abstract :** Recent developments in stock exchange highlight the need for an efficient and accurate method that helps stockholders make better decision. Since stock markets have lots of fluctuations during the time and different effective parameters, it is difficult to make good decisions. The purpose of this study is to employ artificial neural network (ANN) which can deal with time series data and nonlinear relation among variables to forecast next day stock price. Unlike other evolutionary algorithms which were utilized in stock exchange prediction, we trained our proposed neural network with metaheuristic bat algorithm, with fast and powerful convergence and applied it in stock price prediction for the first time. In order to prove the performance of the proposed method, this research selected a 7 year dataset from Parsian Bank stocks and after imposing data preprocessing, used 3 types of ANN (back propagation-ANN, particle swarm optimization-ANN and bat-ANN) to predict the closed price of stocks. Afterwards, this study engaged MATLAB to simulate 3 types of ANN, with the scoring target of mean absolute percentage error (MAPE). The results may be adapted to other companies stocks too.

**Keywords :** artificial neural network (ANN), bat algorithm, particle swarm optimization algorithm (PSO), stock exchange

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