

عنوان مقاله:

A Hybrid Method Based on Neural Networks and a Meta-Heuristic Bat Algorithm for Stock Price Prediction

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نویسندگان:

Marjan Golmaryami - *Department of Computer Engineering and Information Technology, Shiraz University of Technology Shiraz, Iran*

Marziyeh Behzadi - *Department of Computer Engineering and Information Technology, Shiraz University of Technology Shiraz, Iran*

Marziyeh Ahmadzadeh - *Department of Computer Engineering and Information Technology, Shiraz University of Technology Shiraz, Iran*

خلاصه مقاله:

Recent developments in the stock market have created an urgent need for efficient methods to help stockholders take appropriate decisions about their stocks. Since large fluctuations occur in the stock market over time and there are many parameters which influence this, it seems difficult to make good decisions that are also well-timed. The purpose of this study is to apply artificial neural networks (ANNs), which can deal with time series data and nonlinear parameters, to predict the next day's stock price. This research has trained the proposed ANN with a meta-heuristic bat algorithm which has a fast and powerful convergence. The recommended method has been applied to stock price forecasting for the first time. This work has used a seven-year dataset of a private bank stocks in order to prove the performance of the suggested method. After data pre-processing, three types of ANNs (back propagation-ANN, particle swarm optimization-ANN and bat-ANN) were employed to predict the stocks' closing price. Afterwards, MATLAB was used to evaluate the performance of these three methods by scoring the target of the mean absolute percentage error (MAPE). This paper indicates that the bat algorithm adjusts the weight matrix of ANN more precisely than the two other algorithms. The results may be adapted to other companies' stocks.

کلمات کلیدی:

Artificial Neural Networks, Back Propagation Algorithm, Particle Swarm Optimization Algorithm, Bat Algorithm, Stock Market, Forecasting

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