ABSTRACT

Predicting the stock price movements based on quantitative market data modeling is an open problem ever. In stock price prediction, simultaneous achievement of higher accuracy and the fastest prediction becomes a challenging problem due to the hidden information found in raw data. Various prediction models based on machine learning algorithms have been proposed in the literature. The performance of such learning algorithms heavily depends on the quality of the data as well as optimal learning parameters. Among the conventional prediction methods, the use of neural network has greatest research interest because of their advantages of self-organizing, distributed processing and self-learning behaviors. In this work, dynamic nature of the data is mainly focused. In conventional models the retraining has to be carried out for two cases: the data used for training has higher noise and outliers or model trained without preprocessing; the learned data has to update dynamically for recent changes. In this sense, it is proposed to create a self-repairing dynamic model called Repairing Artificial Neural Network (RANN) that correct such errors effectively.

The repairing includes adjusting the prediction model from noise, outliers, removing a data sample, and adjusting an attribute value. Hence, the total reconstruction of the prediction model could be avoided while saving training time. The proposed model is validated with five different real-time stock market data and the results are quantified to analyze its performance. The performance of the proposed model is validated with five standard stock market data sets such as Nifty 50, Nifty Bank, Nifty Pharma, BSE IT, and BSE Oil and Gas. Data of five years that are collected for each dataset, and the stock price forecasting performance are measured with three error rates and three prediction accuracy measures. The RANN model is compared with the existing five different neural network models. The investigated results have shown that the RANN model is achieving lower error rates and higher prediction accuracy while adopting dynamic changes.

In future, it is planned to explore the other learning models such as Deep Learning, Long-Short Term Memory and Convolutional Neural Network for stock price forecasting as well as to contribute towards achieving better prediction rate.