

An Adaptive LSTM Framework Based on Generalized Model Average

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Abstract

With the rapid development of data acquisition technology and processing equipment, mining the information contained in non-stationary high frequency time series and improving its prediction accuracy have become a hot issue in the field of statistical learning. Based on this, this paper proposes a multi-step LSTM prediction framework based on the generalized model averaging method. On the one hand, the framework can adaptively solve the step size selection problem of the original LSTM model, replace the traditional model selection method, and effectively improve the prediction accuracy of the original model. On the other hand, the proposed method is model free with respect to the basis regression method, and in this paper, specific models such as LSTM-bagging and LSTM-CNN are developed under this framework. In addition, the weighting algorithm for model averaging is also model free, such as subjective weighting, heuristic weighting and optimization weighting. Finally, this paper takes three stock price series in mainland China as an example, and the data analysis results show that the proposed algorithm outperforms the original LSTM model in different accuracy evaluation indexes.

Keywords: High Frequency Time Series, Model Averaging, Neural Networks, Price Forecasting