A Study on Trend Forecasting Using Time Series to Image Encoding

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Abstract

This study applies the technique of encoding multi-dimensional high-frequency time series data into images to preserve multiple information and time dependencies effectively. Next, we apply various deep learning models to extract features from the transformed image sequences for trend forecasting. In the empirical study, we use the high-frequency trading data of Amazon and Intel from July 2007 to July 2017 for investigation. A classification criterion consisting of transaction costs and the trend prediction obtained from the above approach is proposed for intraday trading. The numerical results show that the proposed method outperforms traditional time series methods in forecasting future trends and investment profits.

Keywords: CNN, Gramian angular field, LSTM, high-frequency time series