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Forecasting stochastic neural network based on financial empirical mode decomposition

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Abstract In an attempt to improve the forecasting accuracy of stock price fluctuations, a new one-step-ahead model is developed in this paper which combines empirical mode decomposition (EMD) with stochastic time strength neural network (STNN). The EMD is a processing technique introduced to extract all the oscillatory modes embedded in a series, and the STNN model is established for considering the weight of occurrence time of the historical data. The linear regression performs the predictive availability of the proposed model, and the effectiveness of EMD-STNN is revealed clearly through comparing the predicted results with the traditional models. Moreover, a new evaluated method (q-order multiscale complexity invariant distance) is applied to measure the predicted results of real stock index series, and the empirical results show that the proposed model indeed display a good performance in forecasting stock market fluctuations.

Keywords EMD-STNN forecasting model; stock market fluctuation; empirical mode decomposition; stochastic time strength function; multiscale-MCID analysis

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