Sinformer: An Improved Method Based on Informer for Forecasting Stock Price Trend

Abstract. Accurate forecasting of stock trend can greatly increase investors income by trading at the right time. However, stock data is time series with non-linearity and high volatility. Meanwhile, it is also sensitive to position information. Current methods, even various deep methods, are still facing the problems of low accuracy and weak stability. In order to improve the accuracy of the forecast, we design a single side network structure with a dynamic position mechanism based on informer, named Sinformer. First, the proposed Sinformer only has a decoder part of encoder-decoder structure, and includs pretreatment layer, distillation layer, attention layer, and fully connected layer. Second, a dynamic position mechanism, which consists of multiple matrices, is designed in the distillation layer. Sinformer can capture more position information from the stock data, reduces the forecasting error of stock trend, and improves the forecasting accuracy rate. The results of twelve experiments show significant performance of Sinformer. Its average annualized rate of return increases more than 30%, and its average maximum drawdown is only 11.45%. What's more, its average Sharpe is as high as 156.12%, and its average Alpha is 25.88%.

Keywords: Stock trend forecast· Attention· Informer.

1 Introduction

In the field of stock market, prediction of stock trends is one of the most important investment strategies. If the future stock trends can be accurately forecasted, investors can maximize profits by buying (or selling) at the time before the price grows (or declines). Accurate forecasting can help investors maximize profits [1]. Due to the high volatility and non-linear of stock data, accurate forecast is a challenging task [2, 3, 4].

In 1970, the Efficient Market Hypothesis [5] pointed out that stock market information directly reflected stock prices. Since then, researchers have used traditional statistical econometric models to fit the historical curve of stock prices to forecast future prices. These models are autoregressive [6], Autoregressive Integrated Moving Average (ARIMA) [7], and Autoregressive Conditional Heteroskedasticity (GARCH) [8, 7], etc.. However, at the end of the 20th century, the fractal market hypothe [9] pointed out that stock prices are non-linear, highly volatile, and non-stationary, and market information is not spreading uniformly. As a result, traditional econometric models are not effective for forecasting stock trends.