THE UNIVERSITY OF CHICAGO

Department of Statistics
MASTER'S THESIS PRESENTATION

MENGYAO YANG

Department of Statistics
The University of Chicago

Financial Time Series Forecasting Using Two-Step Independent Component Analysis-Support Vector Regression Model

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ABSTRACT

Financial time series data forecasting is one of the most difficult tasks in time series forecasting. It is challenging since financial time series data is noisy and depends on complicated market information which is intangible to the public. Lu, Lee and Chiu's study (2009) suggests that support vector regression (SVR) might be a useful technique to apply on financial time series forecasting. In order to reduce the effect of noise, independent component analysis (ICA) is proposed to be used prior to SVR to form a two-stage model. ICA is a signal process technique that does not require any prior knowledge of the signal. Once independent components (ICs) are generated by ICA, the IC that best represents noise can be identified and removed from the study. The remaining ICs can then be used to forecast the financial time series data. This project aims at following Lu et al.'s study and attempting to use the same technique to forecast Dow Jones opening index, and then comparing it with the ICA-SVR model that does not remove the effect of noise in data. The experimental result, however, shows that the removal of noise IC worsens the model's performance and makes it not very effective in forecasting Dow Jones opening index. The lack of input variable might be a major cause of this result. Only three variables are used in this project to forecast Dow Jones opening index, and as a result the removal of the noise IC may remove too much useful information that are valuable for making the prediction.