NSYSU-Waseda International Symposium
Time Series, Machine Learning and Causality Analysis
Date: 2-3 September 2019
Venue: International Conference Room SC 1005,
College of Science,
National Sun Yat-sen University, Kaohsiung.

Program

September 2

09:50 – 10:00 Meihui Guo (National Sun Yat-sen University), Opening

Session (I):   10:00~12:10   chaired by Ching-Kang Ing

10:00 – 10:50   Masanobu Taniguchi (Waseda University)

Time Series Analysis under Non-Standard Settings

10:50 – 11:30   Shih-Feng Huang (National University of Kaohsiung)

Stock Market Trend Prediction Using Functional Time Series Approach

11:30 – 12:10   Hai-Tang Chiou (National Tsing Hua University)

Variable Selection for High-Dimensional Regression Models with Time Series and

Heteroscedastic Errors

12:10 – 13:30 Lunch break

Session (II):   13:30~15:00   chaired by Akitoshi Kimura

13:30 – 14:20   Takayuki Shiohama (Tokyo University of Science)

Risk-Based Asset Allocation Strategies for Factor Investing

14:20 – 15:00   ShengLi Tzeng (National Sun Yat-sen University)

Parsimonious Imaging Biomarkers for Lung Tumor Classification

15:00 – 15:30 Coffee break

Session (III):   15:30~17:00   chaired by Mong-Na Lo Huang

15:30 – 16:10   Hsiang-Ling Hsu (National University of Kaohsiung)

On model selection from a finite family of possibly misspecified time series models

16:10 – 17:00   Kou Fujimori (Waseda University)

The Dantzig Selector for Statistical Models of Stochastic Processes in High

Dimensional and Sparse Settings

18:00 –   Dinner

September 3

Session (IV):   10:00~17:00   Free Discussion

Abstract

Taniguchi, Masanobu

Waseda University, Japan

Joint circular distributions in view of higher order spectra of time series

Abstract:

This talk delivers a series of recent developments for time series analysis under non-standard settings. Concretely the following subjects are addressed:

(i) Non-regular estimation for discontinuous spectra.

(ii) Jackknifed Whittle estimation.

(iii) Higher order asymptotic theory for semi-parametric spectral estimation.

(iv) Asymptotics of realized volatility with ARCH(∞) microstructure noise.

(v) Model selection for contiguously specified spectral family.

The results show unusual aspects of the asymptotic theory, and open a new horizon for time series.

Huang, Shih-Feng

National University of Kaohsiung, Taiwan

Stock Market Trend Prediction Using Functional Time Series Approach

Abstract

Thanks to advanced technologies, ultra-high frequency limit order book (LOB) data are now available to data analysts. An LOB contains comprehensive information on all transactions in a market. We use LOB data to investigate the high frequency dynamics of market supply and demand (S-D) and inspect their impacts on intra-daily market trends. The intra-daily S-D curves are fitted with B-spline basis functions. Technique of multiresolution is introduced to capture inhomogeneous curvature of the S-D curves and a lasso-type criterion is employed to select a common basis set. Based on empirical evidence, we model the time varying coefficients in the B-spline interpolation by vector autoregressive models of order p ($\geq$ 1). The Xgboost algorithm is employed to extract information from the areas under the S-D curves to predict the intra-daily market trends. In the empirical study, we analyze the LOB data from LOBSTER (https://lobsterdata.com/). The results show that the proposed approach is able to recover the S-D curves and has satisfactory performance on both curve and market trend predictions.

Chiou, Hai-Tang

National Tsing Hua University, Taiwan

(co-author: Meihui Guo, Ching-Kang Ing)

Variable Selection for High-Dimensional Regression Models with Time Series and Heteroscedastic Errors

Abstract

Although existing literature on high-dimensional regression models is rich, the vast majority of studies have focused on independent and homogeneous error terms. In this article, we consider the problem of selecting high-dimensional regression models with heteroscedastic and time series errors, which have broad applications in economics, quantitative finance, environmental science, and many other fields. The error term in our model is not only allowed to be short- or long-range dependent, but also contains a high-dimensional dispersion function accounting for heteroscedasticity. By making use of the orthogonal greedy algorithm and the high-dimensional information criterion, we propose a new model selection procedure that can consistently choose the relevant variables in both the regression and the dispersion functions. The finite sample performance of the proposed procedure is also illustrated via simulations and real data analysis.

Hsu, Hsiang-Ling

National University of Kaohsiung, Taiwan

(co-author: Ching-Kang Ing, Howell Tong)

On model selection from a finite family of possibly misspecified time series models

Abstract

Consider finite parametric time series models. `I have n observations and k models, which model should I choose on the basis of the data alone?' is a frequently asked question in many practical situations. This poses the key problem of selecting a model from a collection of candidate models, none of which is necessarily the true data generating process (DGP). Although existing literature on model selection is vast, there is a serious lacuna in that the above problem does not seem to have received much attention. In fact, existing model selection criteria have avoided addressing the above problem directly, either by assuming that the true DGP is included among the candidate models and aiming at choosing this DGP, or by assuming that the true DGP can be asymptotically approximated by an increasing sequence of candidate models and aiming at choosing the candidate having the best predictive capability in some asymptotic sense. In this article, we propose a misspecification-resistant information criterion (MRIC) to address the key problem directly. We first prove the asymptotic efficiency of MRIC whether the true DGP is among the candidates or not, within the fixed-dimensional framework. We then extend this result to the high-dimensional case in which the number of candidate variables is much larger than the sample size. In particular, we show that MRIC can be used in conjunction with a high-dimensional model selection method to select the (asymptotically) best predictive model across several high-dimensional misspecified time series models.

Fujimori, Kou

Waseda University, Japan

The Dantzig selector for statistical models of
stochastic processes in high dimensional and sparse settings

Abstract

The Dantzig selector, which was proposed by Cand¥'es and Tao in 2007, is an estimation procedure for regression models in high-dimensional and sparse settings. In this talk, the Dantzig selectors for some statistical models of stochastic processes will be discussed. We apply this procedure to Cox's proportional hazards model and some specific models of diffusion processes and prove the consistencies and the variable selection consistencies of the estimators which enables us to reduce the dimension.

Speakers

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圖例		
機車停車場	郵局	登山步道
汽車停車場	書(禮品)店	海水浴場
商鋪	餐廳	保健中心

行政單位
1. 行政大樓
2. 圖資大樓
3. 逸仙館
4. 體育館
5. 學生活動中心
6. 國際研究大樓

教學單位
7. 社會科學院
8. 管理學院
9. 理學院
10. 工學院
11. 生科館
12. 物理館
13. 化學館
14. 材料大樓
15. 理工大樓
16. 電資大樓
17. 綜合大樓(左)
18. 海洋科學學院
19. 文學院
20. 藝術學院

宿舍
21. 職員宿舍
22. 女生宿舍-H/L棟
23. 男生宿舍-翠亨
24. 男生宿舍-武嶺

運動場所
25. 操場(排球、籃球場)
26. 游泳池
27. 網球場
28. 棒壘球場
29. 溜冰場

氣氛設施
30. 國父及蔣公銅像
31. 蔣公行館
32. 幼稚園
33. 海景餐廳(校友會館)
34. 周大觀藝術銅雕
35. 隧道口
36. 西子樓

海工館(右)