Xiaofei XU (许晓菲)

Assistant Professor
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Position

- Assistant Professor, Department of Probability and Statistics, Wuhan University, Hubei, China. June 2022 – Present
- Assistant Professor, Research Institute for Science and Engineering, Waseda University, Japan. Jan 2021– May 2022
- Research Fellow, Risk Management Institute, National University of Singapore, Singapore. June 2020 – Dec 2020
- Research Assistant, Department of Mathematics, National University of Singapore, Singapore. Aug 2019 – June 2020

Education

- Ph.D. in Statistics, Department of Statistics and Applied Probability, National University of Singapore. Aug 2015 – March 2020.
    - ➢ Thesis topic: Complicated time series modeling & forecasting with high-dimensionality and non-stationarity
    - ➢ Supervisor: A/P Ying CHEN. GPA: 4.7/5, A
- B.Sc. in Statistics, Department of Statistics and Finance, University of Science and Technology of China (中国科学技术大学). Aug 2011-July 2015.
    - ➢ GPA: 91/100 (Top 3%), Outstanding Student Scholarship (Gold) (Top 5%), Zhang Zongzhi Sci-tech Scholarship (Top 5%), Samsung Scholarship (Top 3%)

Research Interests

Functional Data Analysis; Non-Stationary Time Series Analysis; Forecasting; High Dimensional Data Analysis; Spectral Density; Count Time Series.

Publications and Working Papers

Working paper

1. **Xu, X.*,** Chen, Y., Liu, Y., Goto, Y., and Taniguchi, M. (2022) "Long memory modelling to covid-19 pandemic count series". *Submitted.*
2. **Xu, X.*,** Taniguchi, M., and Murata, N. (2022) "UMVU estimation for Time Series". *Submitted.*
3. **Xu, X.*** and Taniguchi, M. (2022) "Second-order robustness for time series inference". *Submitted.*
4. "Zero-inflated integer-valued modeling for US congress speech phrases" with Ying Chen, Steve Kou, Xiuqin Xu, 2022.
5. "Adaptive modeling for accounting fraud prediction of publicly traded U.S. firms" with Bin Ke, Ying Chen and Julia Yu, 2022.
6. "Adaptive multi-stage modelling" with Ying Chen and Taniguchi Masanobu, 2022.

Publications

1. Goto, Y., Suzuki , K., **Xu, X**.*, & Taniguchi, M. (2022) "Two-way random ANOVA model with interaction disturbed by dependent errors". *The Annals of the Institute of Statistical Mathematics.* Accepted.
2. **Xu, X.***, Liu, Y., & Taniguchi, M. (2022) "Higher order asymptotic theory for minimax estimation of time series". *Journal of Time Series Analysis.* To appear. https://doi.org/10.1111/jtsa.12661

3. **Xu, X.**, Chen, Y.*, Zhang, G. & Koch, T. (2022). Modelling functional time series and mixed-type predictors with partially functional autoregression. *Journal of Business and Economic Statistics*. Accepted. https://doi.org/10.1080/07350015.2021.2011299
4. **Xu, X.***, Li, Z., & Taniguchi, M. (2022) "Comparison between the exact likelihood and Whittle likelihood for moving average processes". *STATISTICA.* 82(1) 3-13. https://doi.org/10.6092/issn.1973-2201/13609
5. **Xu, X.,** Kou, S.* and Chen, Y. (2021). Discussion on *"Text Selection"*. *Journal of Business and Economic Statistics.* 39(4), 883-887. https://doi.org/10.1080/07350015.2021.1942890
6. **Xu, X.*,** & Zakiyeva, N. (2021). Nonlinear network autoregressive model with application to natural gas network forecasting. *Scientiae Mathematicae Japonicae*, e 2020 33 2020-7 (in Editione Electronica).
7. **Xu, X.,** Chen, Y., Chen, C. W. S.*, & Lin, X. (2020). Adaptive log-linear zero-inflated generalized Poisson autoregressive model with applications to crime counts. *The Annals of Applied Statistics*. 14(3): 1493-1515. https://doi.org/10.1214/20-AOAS1360
8. Chen, Y., Koch, T., Lim, K. G., **Xu, X.,** & Zakiyeva, N*. (2020). A review study of functional autoregressive models with application to energy forecasting. *Wiley Interdisciplinary Reviews: Computational Statistics*, e1525. https://doi.org/10.1002/wics.1525

Thesis:

Statistical modeling for high-dimensional and non-stationary time series. Ph.D. thesis, NUS, March 2020.

Some features of the spread of epidemics on a random graph. *B.Sc. thesis*, USTC, Supervised by Prof Zhi-Shui Hu, July 2015.

Visiting Experience

- Visiting to School of Business and Economics, Humboldt University of Berlin. Germany May - June 2016
  - Supervise a master student for a project of face recognition; Search dataset from website and do data processing; Use PCA and machine learning methods (SVM, LDA, etc.) to do classification.
- Visiting to Chinese Academy of Sciences. College Student Research Program. China, June 2014 - July 2014

Research Projects

- Long memory modelling for integer-valued time series of COVID-19 pandemic Jan 2021 –
  - Propose zero-inflated generalized Poisson integer-valued Fractionally Integrated GARCH model; Study long memory features and make multiple step ahead forecast for daily new cases of covid-19 pandemic.
- Higher order asymptotics of minimax estimators for time series Jan 2021 –
  - Study the Bayes estimator and the Bayesian Whittle estimator for Gaussian stationary process; Consider the risk function based on second-order bias; Compare the likelihood and whittle likelihood for MA moprocess
- High-dimensional and functional time series modeling Jan 2019 –Nov 2021
  - Develop functional autoregressive model to deal with complex time series with mixed curve and scalar data-type and high-dimensionality; Analysis and forecast the natural gas flow supply and demand in Germany.
- Project with UPS for AI powered forecasting of Express and WEPs Sep 2019-Nov 2019
  - Apply financial time series modeling (ARIMA, SAR, etc.) and machine learning method (LSTM, ANN, etc.) to improve the Express and WEPs forecast for different lanes (e.g. HK-US); Improve forecasting by learning the data features; Investigate macroeconomic variables' effects.
- Nonstationary volatility process forecasting March 2019 –
  - Apply adaptive multiple stage modeling to forecast the inhomogeneous volatility process of financial market returns; Automatically detect the historical periods with same level of current volatility.
- Nonstationary integer-valued time series modeling July 2018 –Mar 2019

- Develop integer-valued GARCH autoregressive model for count time series with unique features; Derive adaptive approach to handle unforeseeable structural breaks in a data-driven way; Apply the MCMC-based Bayesian inference for model estimation.

Talks in Conference and Workshop

- 8-9 July, 2022, EAC-ISBA 2022 Conference, Online meeting, Feng Chia University, Taiwan.
  - Talk: *Minimax estimation for time series in view of higher-order asymptotics*
- 28-31 March, 2022, Mathematical Society of Japan Spring Meeting 2022, Online meeting, Japan.
  - Talk: *Comparison between the exact likelihood and Whittle likelihood for moving average processes*
- 7-9 March, 2022, Waseda International Symposium "Topological Data Science, Causality, Analysis of Variance & Time Series" , Tokyo, Japan
  - Talk: *Long-memory Log-linear Zero-inflated Generalized Poisson Autoregression for COVID-19 Pandemic Modelling*
- 14-17 September, 2021, Mathematical Society of Japan Autumn Meeting 2021, Online meeting, Japan.
  - Talk: *Minimax estimation for time series in view of higher-order asymptotics.*
- 5-9 September, 2021, Japanese Joint Statistical Meeting 2021, Online meeting, Japan.
  - Talk: *Minimax estimation for time series in view of higher-order asymptotics.*
- 3-4 June, 2021, Annual meeting of the Japanese Society of Computational Statistics, Online meeting, Japan.
  - Talk: *Zero-inflated Generalized Poisson Autoregression for US Congress Speech Phrase Counts*.
- 19-23 March, 2021, Waseda Cherry Blossom Workshop on Topological Data Science, Tokyo, Japan.
  - Talk: *Adaptive log-linear zero-inflated generalized Poisson autoregressive model with applications to crime counts.*
- 20-22 December, 2019, Invited session "Advanced Statistical Modeling for Complex Data" in the 11th ICSA International Conference, Hang Zhou, China.
  - Talk: *Adaptive log-linear zero-inflated generalized Poisson autoregressive model to crime counts*
- July 27-August 1, 2019, The Joint Statistical Meetings 2019, Denver, USA.
  - Session: Applications in Surveys & Social Science - Contributed Papers. Talk: *Adaptive log-linear zero-inflated generalized Poisson autoregressive model with applications to crime counts*
- 18-23 August, 2019, The 62th ISI World Statistics Congress 2019, Kuala Lumpur, Malaysia.
  - Invited session: Computational Statistics and Application. Talk: *Regularized partially functional autoregressive model with application to high-resolution natural gas forecasting in Germany*
- 18 – 20 May, 2018, The International Conference on Frontiers of Data Science, Hang Zhou, China,
  - Talk: *Regularized partially functional autoregressive model with application to high-resolution natural gas forecasting in Germany*
- 12 -13 May, 2018, The 3rd PKU-NUS Annual International Conference on Finance and Economics, Beijing, China,
  - Talk: *Regularized partially functional autoregressive model with application to high-resolution natural gas forecasting in Germany*

Teaching Experience

Lecturer

- Mathematical Statistics (Graduate course, engineering, Wuhan Univ.). Sep 2022 – Dec 2022

TA:

- Statistics Learning II (undergraduate compulsory course, Statistics department, NUS). Jan 2019 – May 2019
- Business Analytics-Data & Decision (undergraduate compulsory course, Business School, NUS). Aug 2016 – Dec 2018
- Statistics for Life Science (undergraduate compulsory course, Statistics department, NUS). Jan 2016 – May 2016

- Mathematical Statistics (undergraduate compulsory course, Statistics department, NUS). Aug 2015 – Dec 2015

Events

- Coordinator of SEED - The International Online Seminar Series: Statistics maschinElEarning Datascience: https://seed.stat.nus.edu.sg/. (Sep 2018 – Dec 2020)
- Co-ordinate Workshop on AI Powered Sentiment Analysis – NLP, Data Science and Others in NUS (Nov 15, 2019)
- Co-ordinate HUB-NUS FinTech Workshop in NUS, Singapore (March 21, 2019)
- Co-ordinate mini-workshops with Government of Singapore Investment Corp (GIC) (May-June 2018)