

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 book

1. ANOVA with Dependent Error (with Y. Goto, H. Nagahata, M. Taniguchi, A.C. Monti)

Working paper

1. **Xu, X.*** and Taniguchi, M. (2023) “Second-order robustness for time series inference”. *Submitted*.
2. “Adaptive modeling for accounting fraud prediction of publicly traded U.S. firms” with Bin Ke, Ying Chen and Julia Yu, 2023.
3. “Adaptive multi-stage modelling” with Ying Chen and Taniguchi Masanobu, 2023.
4. “Estimating conditional covariance matrices dependent on exogenous variables through a latent factor model” with Jang H. and Ji, Z. 2023.

Publications

1. **Xu, X.***, Zhang, Y. J, Liu, Y., Goto, Y., Taniguchi, M., & Chen, Y. (2023+) “Long-memory log-linear zero-inflated generalized Poisson autoregression for Covid-19 pandemic modeling”. *Statistica Sinica*. Accepted.
2. **Xu, X.***, Taniguchi, M., & Murata, N. (2023). UMVU Estimation for Time Series. In *Research Papers in Statistical Inference for Time Series and Related Models: Essays in Honor of Masanobu Taniguchi* (pp. 555-564). Singapore: Springer. https://doi.org/10.1007/978-981-99-0803-5_25

3. Goto, Y., Suzuki, K., **Xu, X.***, & Taniguchi, M. (2023) “Tests for the existence of group effects and interactions for two-way models with dependent errors”. *The Annals of the Institute of Statistical Mathematics*. 75, 511–532.
4. **Xu, X.***, Liu, Y., & Taniguchi, M. (2023) “Higher-order asymptotics of minimax estimators for time series”. *Journal of Time Series Analysis*. 44(2): 247-257. <https://doi.org/10.1111/jtsa.12661>
5. **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>
6. Petkovic, M*, Chen, Y., Gamrath, I., Gotzes, U., Hadjidimitrou, N. S., Zittel, J., **Xu, X.**, & Koch, T. (2022). A hybrid approach for high precision prediction of gas flows. *Energy Systems*. 13(2): 383-408. <https://doi.org/10.1007/s12667-021-00466-4>
7. **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>
8. **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>
9. **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).
10. **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>
11. 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 mprocess
- 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

- 14-18 March, 2023, NUS WASEDA Workshop 2023, NUS, Singapore
 - Talk: Log-linear Zero-inflated Generalized Poisson Autoregression for Covid-19 Pandemic Modelling
- 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*
- 10-12 March, 2022, Otsu Seminar “Recent Developments in Time Series and Related Topics” In honour of Professor Masanobu Taniguchi on the occasion of his retirement, Japan
 - Higher order asymptotics of minimax estimators for time series
- 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

- Time Series Analysis (Undergraduate compulsory course, Wuhan Univ.). Feb 2023 – July 2023
- 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 machine Learning Data Science: <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)