Haotian Xu

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Education

Ph.D in Statistics, University of Geneva, Switzerland 08/2015-07/2021
- Thesis: Contributions to time series analysis
- Advisor: Prof. Maria-Pia Victoria-Feser, Prof. Stéphane Guerrier

M.Sc in Statistics, University of Illinois at Urbana-Champaign, USA 01/2014-05/2015

M.Sc in Applied Statistics, Dongbei University of Finance and Economics, China 09/2011-07/2013

Bachelor in Statistics, Anhui University of Finance and Economics, China 09/2007-07/2011

Academic Positions

Assistant Professor (Harrison Early Career), University of Warwick, UK 09/2023-present

Postdoctoral Researcher, Pennsylvania State University, USA 10/2022-08/2023
- SNSF Postdoc.Mobility Fellowship
- Advisor: Prof. Runze Li

Postdoctoral Researcher, Université Catholique de Louvain, Belgium 06/2022-09/2022
- SNSF Postdoc.Mobility Fellowship
- Advisor: Prof. Johan Segers

Postdoctoral Researcher, University of Warwick, UK 08/2021-05/2022
- Advisor: Prof. Yi Yu

Research interests

- Nonparametric estimation in high-dimensions
- Change point detection and inference
- High-dimensional inference under temporal dependence and contamination

Publications

Xu, H., Wang, D., Zhao, Z., & Yu, Y., "*Change point inference in high-dimensional regression models under temporal dependence*", Annals of Statistics, 52(3) 999-1026, 2024.
Full text: https://doi.org/10.1214/24-AOS2380.

Padilla, C.M.M., **Xu, H.**, Wang, D., Padilla, O.H.M., & Yu, Y., "*Change point detection and inference in multivariable nonparametric models under mixing conditions*", NeurIPS, 2023. Full text: *Link*.

Yu, Y., Chatterjee S., & **Xu, H.**, "*Localising change points in piecewise polynomials of general degrees*", Electronic Journal of Statistics, 16(1), 1855-1890, 2022.
Full text: https://doi.org/10.1214/21-EJS1963.

Guerrier, S., Molinari, R., Victoria-Feser, M. P., & **Xu, H.**, "*Robust two-step wavelet-based inference for time series models*", Journal of the American Statistical Association, 117(540), 1996-2013, 2022. (alphabetical order). Full text: https://doi.org/10.1080/01621459.2021.1895176.

Guerrier, S., Jurado, J., Khaghani, M., Bakalli, G., Karemera, M., Molinari, R., Orso, S., Raquet, J., Kabban, C.M.S., Skaloud, J., **Xu, H.**, & Zhang, Y., "*Wavelet-based moment-matching techniques for*

inertial sensor calibration", IEEE Transactions on Instrumentation and Measurement, *69*(10), 7542-7551, 2020. Full text: https://doi.org/10.1109/TIM.2020.2984820.

Xu, H., Guerrier, S., Molinari, R., & Karemera, M., "*Multivariate signal modeling with applications to inertial sensor calibration*", IEEE Transactions on Signal Processing, *67*(19), 5143-5152, 2019.
Full text: https://doi.org/10.1109/TSP.2019.2935902.

Branca, M., Orso, S., Molinari, R., **Xu, H.**, Guerrier, S., Zhang, Y., & Mili, N., "*Is nonmetastatic cutaneous melanoma predictable through genomic biomarkers?*", Melanoma Research, *28*(1), 21-29, 2018.
Full text: https://doi.org/10.1097/CMR.0000000000000412.

Zhang, Y., **Xu, H.**, Radi, A., Molinari, R., Guerrier, S., Karemera, M., & El-Sheimy, N., "*An optimal virtual inertial sensor framework using wavelet cross covariance*", In 2018 IEEE/ION Position, Location and Navigation Symposium (PLANS) (1342-1350).
Full text: https://doi.org/10.1109/PLANS.2018.8373525.

Xu, H., Guerrier, S., Molinari, R., & Zhang, Y., "*A study of the Allan variance for constant-mean non-stationary processes*", IEEE Signal Processing Letters, *24*(8), 1257-1260, 2017.
Full text: https://doi.org/10.1109/LSP.2017.2722222

Preprints

Xu, H., Padilla, C.M.M., Padilla, O.H.M., & Wang, D., "*Nonparametric estimation of intensity functions in spatial point processes using a higher-order tensor approach*". (preparing for submission).

Xiao, D., **Xu, H.**, Ahn, J., Guerrier, S., Li, R., & Ke, Y., "*Multiple change points detection problems for high-dimensional time series*". (preparing for submission).

Voirol, L., **Xu, H.**, Zhang, Y., Insolia, L., Molinari, R., & Guerrier, S., "*Inference for large scale regression models with dependent errors*". (preparing for submission).
Full text: https://arxiv.org/abs/2409.05160.

Xue, G., **Xu, H.**, & Yu, Y., "*Change point localisation and inference in fragmented functional data*", 2024. (submitted).
Full text: https://arxiv.org/abs/2405.05730.

Kumar, S., **Xu, H.**, Cho, H., & Wang, D., "*Estimation and inference for change points in functional regression time series*", 2024. (submitted).
Full text: https://arxiv.org/abs/2405.05459.

Xu, H., Dubey, P., & Yu, Y., "*Online network change point detection with missing values and temporal dependence*", 2024. (submitted).
Full text: https://arxiv.org/abs/2110.06450.

Xu, H., Guerrier, S., Li, R., & Ke, Y., "*Nonasymptotic theories for tail-robust autocovariance matrix estimation methods*", 2024. (submitted).

Ebooks

Guerrier, S., Molinari, R., **Xu, H.** & Zhang, Y., "*Applied Time Series Analysis with R*".
Full text: https://smac-group.github.io/ts/.

Statistical Softwares

FragmentCP - R package: performs change point localisation and inference in fragmented functional data.

changepoints - R package: performs a series of offline and/or online change-point detection algorithms for numerous settings. Available on CRAN.

rcov - **R package**: collection of tools for estimating robust autocovariance matrix for high-dimensional time series.

avar - **R package**: implements the allan variance and allan variance linear regression estimator for time series models. Available on CRAN.

Grants

Swiss National Science Foundation (SNSF) Postdoc.Mobility Fellowship (USD 120,000), 2022-2023.

Travel Funding, Société Académique de Genève (USD 1400), .

Invited Talks

"*Change point localisation and inference in high-dimensional regression models under dependence*", Statistics Seminar, Fudan University, China, 08/2023.

"*Online network change point detection with missing values and temporal dependence*", Workshop on Changepoint Analysis, University of Warwick, UK, 05/2023.

"*Online network change point detection with missing values*", StatScale Seminar, online, 02/2023.

"*Change point localisation and inference in high-dimensional regression models under dependence*", SMAC Talk, Penn State University, USA, 04/2023.

"*Change point localisation and inference in high-dimensional regression models under dependence*", Statistics Seminar, University of Notre Dame, USA, 11/2022.

"*Change point localisation and inference in high-dimensional regression models under dependence*", ICMS workshop: Structural Breaks and Shape Constraints, Edinburgh, 05/2022.

"*Robust Estimation of Large Autocovariance Matrices*", 2021 ICSA Applied Statistics Symposium, online, 09/2021.

"*Robust Estimation of Large Autocovariance Matrices*", Statistics seminar, Université catholique de Louvain, 05/2021.

"*Long-run Covariance Matrix Estimator for High-dimensional Time Series*", The 3rd International Conference on Econometrics and Statistics, National Chung Hsing University, Taiwan, 06/2019.

"*A GMWM-based Inference for Correlated Latent Processes*", 2017 IMS-China International Conference on Statistics and Probability, Guangxi University For Nationalities, China, 06/2017.

Academic Visits

Visiting student at University of Illinois at Urbana-Champaign, Feb–Jun 2016, Feb-May 2017

Visiting student at Penn State University, Feb–Jun 2018

Teaching experience

Instructor:

- Bayesian forecasting and intervention (undergraduate/graduate), University of Warwick, Spring 2024

- Elementary Mathematical Statistics (undergraduate), Penn State University, Spring 2023

Teaching Assistant: responsible for giving weekly recitation lectures/office hours, exam preparation and grading.

- Statistical Modeling (undergraduate), University of Geneva, Fall 2015-2020

- Business Analytics (undergraduate), University of Geneva, Fall 2016-2017

- Numerical Methods (undergraduate), University of Geneva, Fall 2020

- Statistics I (undergraduate), University of Geneva, Fall 2015-2020

- Mixed Linear Models (graduate), University of Geneva, Fall 2016-2019

Students Mentoring

Gengyu Xue, PhD student at University of Warwick, 2023-present. (co-advised with Prof. Yi Yu; Student Travel Award, ICSDS 2024).

Lionel Voirol, PhD student at University of Geneva, 2024-present. (co-advised with Prof. Stéphane Guerrier).

Academic Services

- Organiser of the Department of Statistics Research Seminar at University of Warwick (Spring and Fall 2024).

- Organiser of the invited session *New advances in statistical learning and simulation-based inference*, CMStatistics, Berlin, 2023.

Skills

Languages: Chinese (native); English (fluent); French (elementary).

Computer Programming and Statistical Software: C++, R, SAS, Matlab, Python

Professional Experience

Statistician, IMS Health (now IQVIA), Beijing, China, 10/2013–01/2014: Design statistical methods to investigate the causes of changes in trend of Rx data in mail order, retail order and longtime-care order. Programmed SAS, SQL and JCL code to manipulate Rx data and generate reproducible report.