

MENGYU XU

Contact Information

Department of Statistics and Data Science
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Education and Training

Ph.D. in Statistics

University of Chicago, Chicago, IL, USA, 2012 - 2016

Dissertation: Two Problems in High-Dimensional Inference: L^2 Test by Resampling and Graph Estimation of Non-Stationary Time Series.

Advisor: Wei Biao Wu.

M.S. in Statistics

University of Chicago, Chicago, IL, USA, 2010 - 2012

Advisor: Prof. Wei Biao Wu.

B.S. in Statistics and Actuarial Science

Renmin University of China, Beijing, China, 2006 - 2010.

Professional Experience

Assistant Professor, Department of Statistics and Data Science, University of Central Florida, FL, USA, 2016 – present

Teaching Experience

- **Instructor**, STA2023H – Statistical Methods I. Fall 2016, Spring 2017, Fall 2017, Spring 2018, Fall 2018, Spring 2019. *University of Central Florida.*
- **Instructor**, STA4130 – Life Contingency I, Fall 2022. *University of Central Florida.*
- **Instructor**, STA4163H – Statistical Methods II, Spring 2022. *University of Central Florida.*
- **Instructor**, STA4164 – Statistical Methods III, Spring 2023. *University of Central Florida.*
- **Instructor**, STA4183 – Theory of Interest. Fall 2018, Fall 2019. *University of Central Florida.*
- **Instructor**, STA4184 – Introduction to Derivative Markets. Spring 2020, Spring 2022, Spring 2023. *University of Central Florida.*
- **Instructor**, STA4186 – Theory of Derivatives Pricing. Fall 2019, Fall 2022. *University of Central Florida.*
- **Instructor**, STA4970H – Honored Undergraduate Thesis. Fall 2019. *University of Central Florida.*

- **Instructor**, STA5206 – Statistical Analysis. Fall 2021. *University of Central Florida*.
- **Instructor**, STA5703 – Data Mining Methods I. Fall 2021. *University of Central Florida*.
- **Instructor**, STA6704 – Data Mining Methods II. Summer 2017. *University of Central Florida*.
- **Instructor**, STA6857 – Applied Time Series Analysis. Spring 2017, Spring 2018, Spring 2019, Spring 2020. *University of Central Florida*.
- **Instructor**, STA6908 – Directed Independent Studies. Spring 2018, Fall 2019, Summer 2020, Fall 2021. *University of Central Florida*.
- **Instructor**, STA7919 – Doctoral Research. Spring 2020, Spring 2022. *University of Central Florida*.
- **Instructor**, STA7920 – Statistical Colloquium. Fall 2022, Spring 2023. *University of Central Florida*.
- **Instructor**, STA7980 – Doctoral Dissertation. Fall 2022, Summer 2022, Spring 2023. *University of Central Florida*.
- **Instructor**, STAT 23400 – Statistical Models and Method 1, Fall 2013. *University of Chicago*.
- **Teaching Assistant**, STAT 30400 – Distribution Theory, Fall 2015, *University of Chicago*.
- **Teaching Assistant**, STAT 33600 – Time Dependent Data, Winter 2014, *University of Chicago*.
- **Teaching Assistant**, STAT 23400 – Statistical Models and Method 1, Fall 2012, Summer 2013, Fall 2014, *University of Chicago*.
- **Teaching Assistant**, STAT 22200 – Linear Models and Experimental Design, Spring 2013, *University of Chicago*.

Mentoring

- Jongjin Kim, Ph.D. student, Clustering high-dimensional time series with Asynchronous change point detection. 2023-present. "High-Dimensional Online Change Point Detection", I served as his dissertation chair.
- Mahdi Mirhosseini, Ph.D. candidate, Department of Statistics and Data Science, UCF. 2019-present. "High-Dimensional Online Change Point Detection", I served as his dissertation chair.
- Vipul Goyal, Ph.D., Department of Mechanical and Aerospace Engineering, UCF. 2017-2021. "Anomaly Detection and Failure Prediction in Gas Turbines", I served as his dissertation co-chair.

- Weijun Huang, Honored Undergraduate Student, UCF, 2016-2019. "Time Series Forecasting and Analysis: A Study of American Clothing Retail Sales Data". I served as his thesis chair.
- I served in the Ph.D. dissertation committee for 19 students .
- I mentored data analytics projects and independent study for 12 master students .

Publications (underlines indicate student co-authors, first author had greatest contribution)

Peer-Reviewed Journal and Conference Publications

1. Chuanhai Zhang, Zhengjun Zhang, **Mengyu Xu**, and Zhe Peng. Good and bad self-excitation: Asymmetric self-exciting jumps in bitcoin returns. *Economic Modelling*, 119:106124, 2023
2. Chun-Hung Wang, Anthony C. Terracciano, Artem E. Masunov, **Mengyu Xu**, and Subith Vasu. Accurate prediction of terahertz spectra of molecular crystals of fentanyl and its analogs. *Scientific reports*, 2021
3. **Mengyu Xu**, Xiaohui Chen, and Wei Biao Wu. Estimation of dynamic networks for high-dimensional nonstationary time series. *Entropy*, 22(1):55, 2020
4. Zhongzhou Chen, **Mengyu Xu**, Geoffrey Garrido, and Matthew W. Guthrie. Relationship between students' online learning behavior and course performance: What contextual information matters? *Phys. Rev. Phys. Educ. Res.*, 16:010138, Jun 2020
5. **Mengyu Xu**, Chun-Hung Wang, Anthony C Terracciano, Artem E Masunov, and Subith S Vasu. High accuracy machine learning identification of fentanyl-relevant molecular compound classification via constituent functional group analysis. *Scientific reports*, 10(1):1–10, 2020
6. **Mengyu Xu**, Danna Zhang, and Wei Biao Wu. Pearson's chi-squared statistics: approximation theory and beyond. *Biometrika*, 106(3):716–723, 2019
7. Xiaohui Chen, **Mengyu Xu**, and Wei Biao Wu. Regularized estimation of linear functionals of precision matrices for high-dimensional time series. *IEEE Transactions on Signal Processing*, 64(24):6459–6470, 2016
8. Xiaohui Chen, **Mengyu Xu**, and Wei Biao Wu. Covariance and precision matrix estimation for high-dimensional time series. *Annals of Statistics*, 41(6):2994–3021, 2013
9. Vipul Goyal, **Mengyu Xu**, Jayanta Kapat, and Ladislav Vesely. Prediction enhancement of machine learning using time series modeling in gas turbines. In ***best paper award Turbo Expo: Power for Land, Sea, and Air***. American Society of Mechanical Engineers Digital Collection, 2021
10. Vipul Goyal, **Mengyu Xu**, Jayanta Kapat, and Ladislav Vesely. Prediction of gas turbine performance using machine learning methods. In *Turbo Expo: Power for Land, Sea, and Air*. American Society of Mechanical Engineers Digital Collection, 2020

11. Vipul Goyal, **Mengyu Xu**, and Jayanta Kapat. Use of vector autoregressive model for anomaly detection in utility gas turbines. In *Turbo Expo: Power for Land, Sea, and Air*, volume 3: Coal, Biomass, Hydrogen, and Alternative Fuels; Cycle Innovations; Electric Power; Industrial and Cogeneration; Organic Rankine Cycle Power Systems. American Society of Mechanical Engineers Digital Collection, 2019
12. Vipul Goyal, **Mengyu Xu**, and Jayanta S Kapat. Statistical modeling in failure detection in gas turbine. In *AIAA Propulsion and Energy 2019 Forum*, volume 4088, 2019

Preprints and Working Papers

1. Danna Zhang and **Mengyu Xu**. A high dimensional cramér-von mises test. *Under second-round review at Statistica Sinica*, 2023+
2. Likai Chen and **Mengyu Xu**. Quantile change point detection for high-dimensional time series. *In preparation*, 2023+
3. **Mengyu Xu**, Zhipeng Lou, and Wei Biao Wu. Half-sampling calibration for high-dimensional two-sample test. *Manuscript*, 2023+
4. Xiaochuan Wang, **Mengyu Xu**, Kim Gryglewicz, and Susanny Beltran. Race and age differences in depression and anxiety during covid-19: A longitudinal study. *In preparation*, 2023+
5. Mahdi Mirhosseini and **Mengyu Xu**. Online change point monitoring from high-dimensional factor models. *In preparation*, 2023+
6. Vipul Goyal, **Mengyu Xu**, Ladslav Vesley, and Jayant Kapat. Gas turbine anomaly detection using deep learning. *In preparation*, 2023+
7. Chait Rendu and **Mengyu Xu**. Gans generated datasets for community health improvement plan (chip) modeling. *In preparation*, 2023+

Grants, Contracts and Awards

- Northrop Grumman Corporation: “Uncertainty Quantification in Digital Twins: A Bayesian Model”. My role: Sole PI . April 2023 - December 2023.
- United Negro College Funds: “ Leveraging Big Data Analytics to Improve the Education and Workforce Outcomes of African American and Hispanic/Latino Students at HBCUs and HSIs”. My role: PI . January 2022 - April 2023.
- Casualty Actuaries of the Southeast: “ Actuarial Science Student Training with Extracurricular Projects”. My role: PI . August 2022 - July 2024.
- Siemens Inc. University Professor Engagement: “Scouting area of Statistics and Big Data”. My role: Sole PI . July 2017 - August 2018.

- *UCF COVID-19 Artificial Intelligence and Big Data Initiative Seed Funding Program: “High-Dimensional Analysis for Spectroscopy of Exhaled Gas from COVID-19 Patients”*. My role: PI. August 2020 - Dec 2022.
- *UCF Seed Funding Program: “Towards Creating a Digital Twin Architecture for a Gas Turbine Engine for Power Generation or Aviation”*. My role: Co-PI. January 2020 - July 2021.

Invited Talks

- The 6th International Conference on Econometrics and Statistics (EcoSta 2023), Tokyo, Japan. August 2023.
- The 12th ICSA International Conference, Hong Kong, July 2023.
- International Conference on Approximation Theory and Beyond, Nashville, TN, May 2023.
- UNCF Leveraging Big Data for Equity, DC, Washington. Jan. 2023.
- The 4th International Conference on Statistical Distributions and Applications (ICOSDA 2019), Huntington, WV. October 2022.
- The 14th International Conference of the ERCIM WG on Computational and Methodological Statistics (CMStatistics 2021), London, Dec. 2021
- International Chinese Statistical Association (ICSA) Applied Statistics Symposium 2020, Virtual Meeting. Dec. 2020.
- The 12th International Conference of the ERCIM WG on Computational and Methodological Statistics (CMStatistics 2019), London, UK. December 2019.
- The 3rd International Conference on Statistical Distributions and Applications (ICOSDA 2019), Grand Rapids, MI. October 2019.
- International Workshop on Data Science 2019, Shenyang, China. July 2019.
- The 3rd International Conference on Econometrics and Statistics (EcoSta 2019), Taichung, Taiwan. June 2019.
- Hangzhou International Conference on Frontiers of Data Science 2019, Hangzhou, China. May 2019.
- International Chinese Statistical Association (ICSA) Applied Statistics Symposium 2018, New Brunswick, NJ. June 2018.
- International Chinese Statistical Association (ICSA) Applied Statistics Symposium 2017, Chicago, IL. August 2017.
- The 1st International Conference on Econometrics and Statistics (EcoSta 2017), Hong Kong. June 2017.
- The 31st New England Statistics Symposium, Storrs, CT. April, 2017.

Service in Professional Community

- Organizer of topic-contributed talk session at the 2022 Joint Statistical Meeting, 2022, Washington DC.
- Organizer and co-chair of the American Statistical Association (ASA) Florida Chapter Meeting 2019, Orlando, FL
- Reviewer for various journals and conferences: Annals of Statistics, Bernoulli, Econometrics and Statistics, Electronic Journal of Statistics, Frontier in Big Data, GlobalSIP 2017, GlobalSIP 2018, IEEE Signal Processing Magazine, IEEE-Transactions on Network Science and Engineering, International Journal of Mathematics & Computer Science, International Journal of Production Research, Journal of Business and Economic Statistics, Journal of Machine Learning Research, Journal of Linear Algebra and Its Applications, Journal of Multivariate Analysis, Journal of Nonparametric Statistics, Statistics and Probability Letters
- Served in department search committee, assessment committee for the BS program in Actuarial Sciences, colloquium committee, the graduate programs committee, undergraduate curriculum committee, the joint search committee of the Stats department and the forensic science center, library liaison, and Diversity, Equality and Inclusion action team at the College of Sciences at University of Central Florida.

Actuarial Exams (SOA/CAS)

Exam P/1, Exam FM/2, Exam MFE/3F, Exam MLC/LC, Exam C/4, VEE.