Yuchen Xu

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EDUCATION

2018 - 2023	Ph.D. Candidate in Statistics & Data Science Cornell University, Ithaca, NY
2014 - 2018	B.S. in Mathematics & Applied Mathematics, Zhiyuan Honored Program Shanghai Jiao Tong University, Shanghai, China
Fall 2017	Research Intern Exchange Center for Applied Mathematics, Cornell University, Ithaca, NY
August 2016	Summer Course on Partial Differential Equations Hertford College, Oxford University, Oxford, UK

RESEARCH THEORY & METHODS

Time Series Analysis:
- Changepoints
- (Hidden) Markov model

Multivariate Analysis:
- Joint matrix diagonalization
- Tensor decomposition
- Blind Source Separation (BSS)

Image Analysis:
- Blob detection
- Ridge detection

RESEARCH APPLICATIONS

- Financial Econometrics
- Nanoparticles
- Geology
- Medical Images and Signals
- Molecular Dynamics

RESEARCH EXPERIENCE

2018 - Present	Matteson Lab, Cornell University Advisor: Prof. David S. Matteson Tasks: Testing simultaneous diagonalizability.
2019 - Present	Atomic-Level Structural Dynamics in Catalysts (ALSDC) Group Advisor: Prof. David S. Matteson Tasks: Clustering nanoparticle structures, w/ Prof. Roberto Rivera; Extraction of TEM atomic columns, w/ Prof. Peter A. Crozier; Estimating transition rate matrices, w/ Prof. Mahmoud Moradi.
2021 - Present	Enterprise Heart Failure Program, New York-Presbyterian (NYP) Hospital Advisor: Prof. Martin Wells Tasks: Heart failure inference from ECG data, w/ Ashley N. Beecy, MD.
2022 - Present	Department of Surgery, Icahn School of Medicine at Mount Sinai Hospital Advisor: Prof. David S. Matteson Tasks: Predicting thyroid cancer recurrence, w/ Denise Lee, MD.

PUBLICATIONS[1]

Xu,Y., Düker, M.-C., and Matteson, D. S., "Testing simultaneous diagonalizability," *Journal of the American Statistical Association*, 2023. DOI: `10.1080/01621459.2023.2202435`. [Online]. Available: `https://doi.org/10.1080/01621459.2023.2202435`.

Manzorro, R., ***Xu,Y.**, Vincent, J. L., Rivera, R., Matteson, D. S., and Crozier, P. A., "Exploring blob detection to determine atomic column positions and intensities in time-resolved TEM images with ultra-low signal-to-noise," *Microscopy and Microanalysis*, vol. 28, no. 6, pp. 1917–1930, Mar. 2022. DOI: `10.1017/s1431927622000356`. [Online]. Available: `https://doi.org/10.1017%2Fs1431927622000356`,
○ *The Most Outstanding Students Awards, Bronze Medal, UPSTAT 2021 Conference*.

Thomas, A. M., Crozier, P. A., **Xu,Y.**, and Matteson, D. S., "Detection and hypothesis testing of features in extremely noisy image series using topological data analysis, with applications to nanoparticle videos," *Technometrics*, 2023. DOI: `10.1080/00401706.2023.2203744`. [Online]. Available: `https://doi.org/10.1080/00401706.2023.2203744`.

MANUSCRIPTS UNDER REVIEW OR REVISION

Xu,Y., Thomas, A. M., Crozier, P. A., and Matteson, D. S., *Dynamic Atomic Column Detection in Transmission Electron Microscopy Videos via Ridge Estimation*, 2023. DOI: `10.48550/arXiv.2302.00816`. [Online]. Available: `https://arxiv.org/abs/2302.00816`,
○ *The Best Student Poster Award, 2022 IEEE Western New York Image and Signal Processing Workshop (WNYISPW)*.

Goolsby, C., Losey, J., **Xu,Y.**, Düker, M.-C., Sherman, M. G., Matteson, D. S., and Moradi, M., "Addressing the embeddability problem in transition rate estimation," Aug. 2019. DOI: `10.1101/707919`. [Online]. Available: `https://doi.org/10.1101%2F707919`, Submitted to the Journal of Pyhsical Chemistry.

SOFTWARE

R package `eigTest` available on Github: Jointly Estimate and Test for Common Eigenvectors.

PRESENTATIONS

Non-parametric ridge recovery of TEM image series given temporal parameterization, 2022 IEEE Western New York Image and Signal Processing Workshop (WNYISPW), (Hybrid) Rochester, NY, Nov. 2022.

Non-parametric ridge recovery of TEM image series given temporal parameterization, Science-Integrated Statistical Learning Section, 2022 INFORMS Annual Meeting, Indianapolis, IN, Oct. 2022.

Recording atomic column positions and intensities via Blob Detection in noise-degraded TEM frames, Data Science in Science Minisymposia, The 37th SIDIM, (Virtual) Puerto Rico, Feb. 2022.

Recording atomic column positions and intensities via Blob Detection in noise-degraded TEM frames, UPSTAT 2021 Conference, (Virtual) Rochester, NY, Apr. 2021.

Testing Simultaneous Diagonalizability, Cornell Celebration of Statistics and Data Science, Ithaca, NY, Sep. 2019.

Testing Simultaneous Diagonalizability, Business and Economic Statistics Section, Speed Session, Joint Statistical Meeting (JSM), Denver, CO, Jul. 2019.

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[1]* First authors contributed equally.

LINKS

Website   **Github**   **LinkedIn**   **Google Scholar**   **ORCID**

SKILLS

Programming:	R	Python	Matlab	LaTeX
	SQL	AWS & Azure	Stan	Java
Language:	English		Mandarin	

TEACHING EXPERIENCE

Spring 2023 @ Cornell	Understanding Machine Learning Instructor: Andrew M. Thomas	Teaching Assistant STSCI 4750
Fall 2021 @ Cornell	Operations Research Tools for Financial Engineering Instructor: David Ruppert	Teaching Assistant STSCI 4630
Spring 2021 @ Cornell	Statistics for Financial Engineering Instructor: David S. Matteson	Teaching Assistant STSCI 5640
Fall 2020 @ Cornell	Statistical Sampling Instructor: Thomas DiCiccio	Teaching Assistant STSCI 3100
Spring 2020 @ Cornell	Basic Probability Instructor: Laurent Saloff-Coste	Teaching Assistant MATH 4710
Fall 2019 @ Cornell	Probability Models and Inference Instructor: Florentina Bunea	Teaching assistant STSCI 3080

SERVICE

January 2023	Reviewer for the Journal of Service Research.
November 2021	Reviewer for the Journal of Econometrics.
January 2021	Reviewer for the Best Student Paper Competition of Joint Statistical Meeting (JSM) Business and Economic Statistics Section (B&E).

INDUSTRY EXPERIENCE

May 2022 — — Aug 2022	Data Scientist Intern Amazon Web Services (AWS), Seattle, WA
	Tasks: Modeling efficacy for internal IT-Services products; Optimizing data aggregation and interpretation logics.
Mar 2018 — — May 2018	Algorithm & Data Science Intern China Appraisal Association Data Analysis (CAAD), Shanghai, China
	Tasks: Regressing and predicting real estate appraisals; Optimizing address search algorithms.