

Yuchen Xu

Curriculum Vitae

Cornell University
Department of Statistics & Data Science
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RESEARCH INTERESTS

Time Series Analysis

Change point detection (Hidden) Markov model

Structured Data Analysis

Joint matrix diagonalization Tensor decomposition
Blind Source Separation (BSS) Independent Component Analysis (ICA)

Image Analysis

Blob detection Ridge detection

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

RESEARCH EXPERIENCE

2018 - Present Research Assistant
Matteson Lab, Cornell University
Advisor: Prof. David S. Matteson
Tasks: Testing simultaneous diagonalizability;
Change point detection & factorization for multivariate time series.

2019 - Present Researcher
Atomic-Level Structural Dynamics in Catalysts (ALSDC) Group
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 Researcher
Enterprise heart failure program, New York-Presbyterian (NYP) Hospital
Advisor: Prof. Martin Wells
Tasks: Heart failure inference from Electrocardiograms (ECG) data.

2022 - Present Researcher
Department of Surgery, Icahn School of Medicine at Mount Sinai Hospital
Tasks: Predicting thyroid cancer recurrence, w/ Denise Lee, MD.

HONORS AND AWARDS

- November 2022 Best Student Poster Award at 2022 IEEE Western New York Image and Signal Processing Workshop (WNYISPW).
- April 2021 Bronze medal presentation at UPSTAT 2021 Conference.

PUBLICATIONS¹

Peer Reviewed Manuscripts

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>.

Submitted

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*, 2022. DOI: 10.48550/ARXIV.2209.13584. [Online]. Available: <https://arxiv.org/abs/2209.13584>.

Xu,Y., Düker, M.-C., and Matteson, D. S., *Testing simultaneous diagonalizability*, Submitted to the Journal of the American Statistical Association, 2021. DOI: 10.48550/ARXIV.2101.07776. [Online]. Available: <https://arxiv.org/abs/2101.07776>.

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>.

In Prep

Xu,Y., Thomas, A. M., Crozier, P. A., and Matteson, D. S., *Dynamic Atomic Column Detection in Transmission Electron Microscopy Videos via Ridge Estimation*, 2022.

PRESENTATIONS

Oral

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, UP-STAT 2021 Conference, (Virtual) Rochester, NY, Apr. 2021.

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

^{1*} First authors contributed equally.

Poster

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.

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.

SOFTWARE

R package `eigTest` available on Github: Approximate and Test Common Eigenvectors.

LINKS

Website:// **Yuchen Xu**
 LinkedIn:// **YuchenXu1015**
 ORCID:// **Yuchen Xu**

Github:// **XycYuchenXu**
 Google Scholar:// **Yuchen Xu**

SKILLS

Programming:	R	Matlab	Python	\LaTeX
	SQL	AWS	Stan	Java

Language:	Native Mandarin	Advanced English
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RELEVANT COURSEWORK

Probability Theory	Mathematical Statistics
Time Series and Spatial Data Science	Statistical/Machine Learning Theory
Bayesian Statistics	Causal Inference
Statistical Consulting	Matrix Computation

TEACHING EXPERIENCE

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

SERVICES

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).

ADDITIONAL TRAINING

Fall 2017 Research Intern Exchange
Center for Applied Mathematics, Cornell University, Ithaca, NY

Aug 2016 Summer Course on Partial Differential Equations
Hertford College, Oxford University, Oxford, UK

INDUSTRIAL EXPERIENCE

May 2022 — Data Scientist Intern
— Aug 2022 Amazon Web Services (AWS), Seattle, WA
Tasks: Modeling efficacy for internal IT-Services products;
 Optimizing data aggregation and interpretation logics.

Mar 2018 — Algorithm & Data Science Intern
— May 2018 China Appraisal Association Data Analysis (CAAD), Shanghai, China
Tasks: Regressing and predicting real estate appraisals;
 Optimizing address search algorithms.