

Yizhou (Jake) Cai

Education

- 2021 – 2026 **Ph.D. in Statistics**, University of South Carolina (UofSC)
Advisor: Dr. Ting Fung Ma
- 2019 – 20 **Master of Science in Financial Modelling**, Department of Statistical Sciences,
Western University (UWO)
Advisor: Dr. Hristo Sendov
- 2018 – 19 **Master of Financial Insurance**, Department of Statistics, University of Toronto
(UofT)
Advisor: Dr. Sebastian Jaimungal
- 2014 – 18 **Bachelor of Science in Mathematics and Applied Mathematics**, Shanghai
Jiaotong University (SJTU)

Work Experience

- Aug 2026 – present **Assistant Professor**, *Department of Mathematics*, Texas State University
- Aug 2026 – present **Collaborator**, *GISense Lab*, University of Texas at Austin
- Sep 2021 – present **Member**, *Human Insight for Data and AI(Hi-Da) Lab*, University of South Carolina
- Sep 2021 – Jul 2026 **Statistical Education Policy Researcher**, *Jiuxianzai Education Consulting, LLC*
- Sep 2025 – May 25 **Consultant**, *Thomas Cooper Library*, University of South Carolina
- Sep 2023 – Aug 25 **Lab Instructor**, *University of South Carolina*
- Sep 2021 – Aug 23 **Research & Teaching Assistant**, *University of South Carolina*
- Mar 2019 – Sep 19 **Research Assistant**, *University of Toronto and Oanda*
- Jan 2019 – Sep 19 **Member**, *Fields CQAM Lab*, University of Toronto

Grants

- 2023 **Cluster Detection on Ordinal Tensor under Dependence**, *PI*, Jiuxianzai Education Consulting, LLC, \$14,000
- 2022 **Evaluation System of College Admission Preference**, *PI*, Jiuxianzai Education Consulting, LLC, \$28,000
- 2019 **Western Graduate Research Scholarship**, *Western University*, \$4,000

2018 **Volatility Prediction of FX Market and Data Science Strategy**, *University of Toronto and Oanda*, \$3,000

Awards

2024 **Travel Award for ENVR**, *Boulder, CO*

2024 **Travel Award for ENAR**, *Baltimore, ML*

2023 **Huynh-Feldt Award**, *University of South Carolina, Columbia, SC*

Research Interests

- Scalable Inference and Methods
- Data Science
- Dependence Modeling
- Statistical Applications in Public Health and Epidemiology
- Interdisciplinary Applications in Machine Learning and Data Science
- High-dimensional Statistics
- Change Point Analysis
- Spatiotemporal Statistics

Selected Peer-reviewed Publications

- [1] Lookingbill, V., Mohammadi, E., & **Cai, Y.** (2023). Assessment of Accuracy, User Engagement, and Themes of Eating Disorder Content in Social Media Short Videos. ***JAMA Network Open***. 2023;6(4):e238897. [doi] [IF = 13.8, Medicine - General Medicine: 25/668]
- [2] Ma, T. F., **Cai, Y.**, Shi, P. & Zhu, J. (2024). Hierarchical Dependence Modeling for the Analysis of Large Insurance Claims Data. ***The Annals of Applied Statistics***, 18(2), 1402-1420. [doi]
- [3] Liu, J., Ma, T. F., Gao, R., & **Cai, Y.** (2025). Investigating teacher rating effect using the Pediatric Symptoms Checklist – 17 for elementary school children. Paper presented at ***the Annual Conference of American Educational Research Association***, Denver, Colorado.
- [4] Mohammadi, E., **Cai, Y.**, Novin, A., Vera, V. & Mohammadi, E.S. (2025). Who is a Scientist? Gender and Racial Biases in Google Vision AI. ***AI and Ethics***. [IF = 6.1]
- [5] Mohammadi, E., Thelwall M., **Cai, Y.**, Collier T. & Eftekhari, A. (2026). Is Generative AI Reshaping Academic Practices Worldwide? A Survey of Adoption, Benefits, and Concerns. ***Information Processing and Management***. [IF = 7.4, Engineering - Computer Science Applications: 34/947, Engineering - Management Science and Operations Research: 6/218]
- [6] Yin, Y., & **Cai, Y.** Estimating RMSEAD in Ordinal Factor Analysis. ***Multivariate Behavioral Research***. Major Revision.

Yizhou (Jake) Cai

✉ yizhouc@txstate.edu

Page 2/5

- [7] **Cai, Y.** & Ma, T. F. Maximum Ideal Likelihood Estimation: A Unified Inference Framework for Latent Variable Models. ***Journal of the Royal Statistical Society Series B***. Under Review.
- [8] Mohammadi, E. & **Cai, Y.** Generative AI in U.S. Healthcare: A Survey of Medical Researchers about Adoption, Concerns, and the Future. ***International Journal of Medical Informatics***. Under Review.
- [9] Mohammadi, E., **Cai, Y.**, Vera, V., Borji, S., Kalantari, A., Eftekhari, A. What Do We Find with AI? A Comparison of Google Scholar and Scholar Labs. ***Telematics and Informatics***. Under Review
- [10] Zou, A., **Cai, Y.**, Ma, T.F. Voronoi-Elitism Genetic Algorithm: A Generic Derivative-Free Routine With Theory and Implementation for Statistical Optimization. ***Statistics and Computing***. Under Review
- [11] **Cai, Y.**, Liu, Z., Ma, T. F. & Zhang, J. Causal Inference with Multiple Change Points for Replicated Multivariate Time Series with Application to the Prevalence of Mental Disorders Symptoms. In preparation.
- [12] **Cai, Y.**, Bussing, A., Ma, T. F. & Shi, P. A Risk Sharing Rule for Peer-to-peer (P2P) Insurance for Hail Losses via Conditional Expectation. In preparation.
- [13] **Cai, Y.**, Chen, F., Hu, H. & Ma, T. F. A General Non-parametric Dependence Measure via Eigenvalues. In preparation.
- [14] **Cai, Y.**, Mei, S., Chen, F., Hong, Q., Pang, W. & Ma, T. F. Item-based University Analysis System: A Quantitative Method of Admission Preference Detection. In preparation.

Other Publications

Patent

- [15] **Cai Y.**, Mei S., Wu S., Pang W., Dong S., Sun J. (2024). "A Data Analysis and Evaluation Method, System, Electronic Storage Equipment." CHN 202410176158.8.

Selected Conference Paper and Presentations

- Jul 25 **Cai, Y.**, Ma, T. F. (2025). Covariance Matrix Estimation and its Jackknife Approximation on High Dimensional Spatial Data, ***Donghu Conference***, Wuhan, Hubei, China.
- Jun 25 **Cai, Y.**, Ma, T. F. (2025). A Probability Transfer Approach of Latent Variable Models., ***Young Scholar Conference***, Hohhot, Inner Mongolia, China.
- Apr 25 Liu, J., Ma, T. F., Gao, R., & **Cai, Y.** (2025). Investigating teacher rating effect using the Pediatric Symptoms Checklist – 17 for elementary school children, ***the Annual Conference of American Educational Research Association***, Denver, Colorado.

Yizhou (Jake) Cai

✉ yizhouc@txstate.edu

Page 3/5

- Apr 25 **Cai, Y.** Maximum Ideal Likelihood Estimate: A Unified Framework for Latent Variable Models (2025), *South Carolina Chapter American Statistical Association (SC-ASA) 2025*, Columbia, SC
- Mar 25 **Cai, Y.** An Alternative Methods of Latent Variable Models with Inference (2025), *Statistics Seminar, Indiana University Indianapolis*, Remote
- Oct 24 **Cai, Y.** Spatial Land Surface Temperature Data Analysis: An Estimation Framework based on Latent Variable Models (2024), *ENVIR*, Boulder, CO
- Apr 24 **Cai, Y.** Estimation of Finite Mixture Regression Under Dependence (2024), *South Carolina Chapter American Statistical Association (SC-ASA) 2024*, Columbia, SC
- Mar 24 **Cai, Y.** Hierarchical Regression Model Estimation: Approximation Based on Random Markov Field (2024), *ENAR*, Baltimore, ML
- Jun 19 **Cai, Y.**, Jaimungal, S., Chen, Y. Foreign Exchange Volatility Regime Prediction: Mixed AI Methods (2019), *Fields Industry Workshop*, Toronto, ON, Canada

Book Chapters

- [16] **Cai Y.**, Mei S. (2025). Preparation Handbook: Statistical Inference and Mathematical Statistics.
- [17] Mei S., **Cai Y.** (2025). Preparation Handbook: Mathematical Statistics and Time Series.

Teaching Experiences

Jiuxianzai Education

- Online Advanced Statistics Inference, *Lecturer*, Spring 25
- Online Statistics Inference, *Lecturer*, Fall 24
- Online Review: Mathematics Analysis and Linear Algebra, *Lecturer*, Spring 23, Spring 24
- Online Introduction to Machine Learning Methods, *Lecturer*, Spring 23, Spring 24
- Online Algorithm and Data Science, *Lecturer*, Spring 23, Spring 24
- Online Probability, *Lecturer*, Fall 23
- Online Mathematical Statistics, *Lecturer*, Fall 22
- Online Introduction to Mathematical Statistics, *Lecturer*, Spring 22

University of South Carolina

- STAT 201 Elementary Statistics, *Undergraduate Lab Instructor*, Department of Statistics, Spring 24, Fall 24, Spring 25
- STAT 704 Data Analysis I, *Graduate Teaching Assistant*, Department of Statistics, Fall 2023
- STAT 712 Mathematical Statistics I, *Graduate Teaching Assistant*, Department of Statistics, Fall 2023
- STAT 519 Sampling, *Undergraduate Teaching Assistant*, Department of Statistics, Spring 2023
- STAT 513 Theory Statistical Inference, *Undergraduate Teaching Assistant*, Department of Statistics, Fall 2022

Yizhou (Jake) Cai

✉ yizhouc@txstate.edu

Page 4/5

STAT 512 Mathematical Statistics, *Undergraduate Teaching Assistant*, Department of Statistics, Spring 2022

STAT 511 Probability, *Undergraduate Teaching Assistant*, Department of Statistics, Fall 2021

Mentoring and Supervision

STAT 511 Probability, *Undergraduate Teaching Assistant*, Department of Statistics, Fall 2021

2026 – Present Independent Study: Statistical Verification of IBUAS, *University of Monash*

2025 – Present Independent Study: A correlation Measure Based on Eigen Values, *Shanghai University of Finance and Economics*

2022 – Present Independent Study: Change Point Detection on College Entrance Preference, *University of Melbourne*

2023 – 2024 Member of Committee, Mock Interview Mentoring, *Jiuxianzai Education*

2023 Mentor for PhD Qualification, *Texas AM University*

2022 – 2023 Mentor for PhD Courses, *Bowling Green State University*

2022 Mentor for PhD Courses, *Jiangsu Normal University*

2022 Independent Study: Simulation Study of IRT under Dependence, *University of Malaya*

2020 Mentor for Master Courses, *University of Glasgow*

Professional Services

Reviewer: ACM SIGSPATIAL International Conference on Advances in Geographic Information System 2024

Reviewer: Soft Computing (SOCO)

Reviewer: Frontier in Public Health

Computing

Programming: Proficient in MATLAB, R and Python. Some experience with C++, SAS, SPSS and Stata

Others: Proficient in $\text{\LaTeX}$. Experience with SLURM for high-performance computing