

Canyi Chen

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Brief Research Bio

I am a statistical methodology researcher who develops statistical theories, methodologies, algorithms, and software for complex data structures, including causal mediation analysis, distributed data analytics, modeling of complex dependence structures, and genAI-enhanced inference.

Research Interests

○ Distributed statistical methods and algorithms; Causal mediation analysis; Synthetic data analytics.

Experience

Department of Biostatistics, University of Michigan
Postdoctoral Research Fellow

Ann Arbor
August, 2023 –

Education

Renmin University of China
Ph.D. in Statistics

Beijing
2018 – 2023

Dissertation: “Distributed Statistical Algorithms for Nonsmooth Problems: Theories and Applications”

Beijing Normal University
B.Sc. in Mathematics and Applied Mathematics

Beijing
2014 – 2018

Publications

Journal Articles

* indicates equal contributions

† indicates corresponding author(s) (if not the senior author)

boldface indicates me

- [1] B. Chen* and **C. Chen***†. “A Unified and Efficient Algorithm for Penalized Convolved Support Vector Machines”. In: *Statistics and Computing* (2026). Forthcoming.
- [2] **C. Chen***, Z. Zhu*, and L. Zhu*†. “Efficient Decoding from Heterogeneous 1-Bit Compressive Measurements over Networks”. In: *Statistica Sinica* (2026). Forthcoming.
- [3] N. Qiao*, W. Li*, J. Zhang†, and **C. Chen**†. “Scalable and Distributed Individualized Treatment Rules for Massive Datasets”. In: *Biometrics* (2026). arXiv: 2511.05842. Forthcoming.

- [4] **C. Chen**^{*}, R. Kundu, W. Hao, and P. X.-K. Song[†]. “Copula Structural Equation Models for Mediation Pathway Analysis”. In: *Festschrift in Honor of Claudia Czado*. Ed. by T. Nagler, D. Kurowicka, R. Cooke, and H. Joe. Springer, 2025.
- [5] **C. Chen**^{*}, N. Qiao^{*}, and L. Zhu^{*†}. “Efficient Distributed Learning over Decentralized Networks with Convolved Support Vector Machine”. In: *Journal of the American Statistical Association* (2025). DOI: 10.1080/01621459.2025.2550671.
- [6] W. Hao, **C. Chen**, and P. X.-K. Song[†]. “A Class of Directed Acyclic Graphs with Mixed Data Types in Mediation Analysis”. In: *Canadian Journal of Statistics* (2025). DOI: 10.1002/cjs.70016.
- [7] C. He^{*}, **C. Chen**^{*}, and L. Zhu[†]. “A Goodness-of-fit Assessment for General Learning Procedure in High Dimensions”. In: *Journal of the American Statistical Association* (2025). DOI: 10.1080/01621459.2025.2529602.
- [8] N. Qiao^{*}, **C. Chen**^{*†}, and Z. Zhu^{*}. “Robust and Efficient Sparse Learning over Networks: A Decentralized Surrogate Composite Quantile Regression Approach”. In: *Statistics and Computing* 35.1 (2025), p. 24. DOI: 10.1007/s11222-024-10547-w.
- [9] B. Chen and **C. Chen**[†]. “Convolved Support Matrix Machine in High Dimensions”. In: *Statistica Sinica* (2024). DOI: 10.5705/ss.202024.0194.
- [10] **C. Chen**[†]. “Scalable and Globally Convergent Algorithm for Sufficient Dimension Reduction”. In: *Statistics and Its Interface* 17.3 (2024), pp. 479–491. DOI: 10.4310/23-SII798.
- [11] **C. Chen**^{*}, B. Chen^{*}, L. Kong, and L. Zhu[†]. “Robust Multitask Learning in High Dimensions under Memory Constraint”. In: *Statistical Analysis and Data Mining: The ASA Data Science Journal* 17.3 (2024), e11700. DOI: 10.1002/sam.11700.
- [12] **C. Chen** and Z. Zhu[†]. “Byzantine-Robust and Efficient Distributed Sparsity Learning: A Surrogate Composite Quantile Regression Approach”. In: *Statistics and Computing* 34.5 (2024), p. 158. DOI: 10.1007/s11222-024-10470-0.
- [13] Y. He, **C. Chen**, and W. Xu[†]. “Debiased Distributed Quantile Regression in High Dimensions”. In: *Statistics and Its Interface* 17.3 (2024), pp. 337–347. DOI: 10.4310/22-SII759.
- [14] N. Qiao and **C. Chen**[†]. “Fast and Robust Low-Rank Learning over Networks: A Decentralized Matrix Quantile Regression Approach”. In: *Journal of Computational and Graphical Statistics* 33.4 (2024), pp. 1214–1223. DOI: 10.1007/s11222-024-10547-w.
- [15] B. Chen and **C. Chen**. “Fast Optimization Methods for High-Dimensional Row-Sparse Multivariate Quantile Linear Regression”. In: *Journal of Statistical Computation and Simulation* 94.1 (2023), pp. 69–102. DOI: 10.1080/00949655.2023.2232504.
- [16] **C. Chen**^{*}, Y. Gu^{*}, H. Zou^{*}, and L. Zhu^{*†}. “Distributed Sparse Composite Quantile Regression in Ultrahigh Dimensions”. In: *Statistica Sinica* 33 (2023). DOI: 10.5705/ss.202022.0095.
- [17] **C. Chen**^{*}, W. Xu^{*}, and L. Zhu^{*†}. “Distributed Estimation in Heterogeneous Reduced Rank Regression: With Application to Order Determination in Sufficient Dimension Reduction”. In: *Journal of Multivariate Analysis* 190 (2022), p. 104991. DOI: 10.1016/j.jmva.2022.104991.
- [18] **C. Chen** and L. Zhu[†]. “Distributed Decoding from Heterogeneous 1-Bit Compressive Measurements”. In: *Journal of Computational and Graphical Statistics* 32.3 (2022), pp. 884–894. DOI: 10.1080/10618600.2022.2118751.

- [19] Y. Zhang, **C. Chen**, and L. Zhu[†]. “Sliced Independence Test”. In: *Statistica Sinica* 32 (2022). DOI: 10.5705/ss.202021.0203.
- [20] P. Song, **C. Chen**, Y. Lou, H. Jiang, W. Li, and L. Zhu. “Assessing Effectiveness of Integrated Strategies for Preventing and Controlling the Outbreak of COVID-19 and Predicting Impact of Opening Exit Channels to Leave Hubei Province”. In: *Chinese Journal of Applied Probability and Statistics* 36.3 (2020), pp. 321–330. DOI: 10.3969/j.issn.1001-4268.2020.03.007.

Software

- SIT: ASSOCIATION MEASUREMENT THROUGH SLICED INDEPENDENCE TEST. 2023. [Link]
- abima: ADAPTIVE BOOTSTRAP INFERENCE FOR MEDIATION ANALYSIS WITH ENHANCED STATISTICAL POWER. 2024. [Link]
- abimaQ: ADAPTIVE BOOTSTRAP INFERENCE FOR QUANTILE MEDIATION ANALYSIS WITH ENHANCED STATISTICAL POWER. 2025. [Link]
- MarginalMaxTest: TEST THE MARGINAL CORRELATION BETWEEN A SCALAR RESPONSE VARIABLE WITH A VECTOR OF EXPLANATORY VARIABLES USING THE MAX-TYPE TEST WITH BOOTSTRAP. 2025. [Link]
- ZoteroQuickLookNG-z7: BRING QUICK LOOK TO ZOTERO 7 IN MACOS. 2025. [Link]

Grant Proposals

Renmin University of China

Canonical Correlation Analysis of Functional Data 2020

National Students’ Innovation and Entrepreneurship Training Program

Asymptotics of the Derrida–Retaux Branch System 2016

Fellowships, Honors, and Awards

Excellent Doctoral Dissertation Award of Renmin University of China 2024

UMPDA Conference Award, University of Michigan 2024

National Scholarship of China 2023

Outstanding Graduate of Renmin University of China 2023

Wu Yuzhang Scholarship Finalist 2023

Jingdong Special Scholarship Finalist 2022

The Best Presented Poster 2020

Distributed Decoding from Heterogeneous 1-Bit Compressive Measurements

Statistics and Data Science Young Scholars Forum, Beijing. [pdf]

National Second Prize in National Undergraduate Mathematical Modeling Contest 2016

Volunteer Experience

Teaching Assistant

Computer Skills in Data Science – Ph.D. Level Fall 2019

Asymptotic Statistics – Ph.D. Level
Natural Language Processing – Ph.D. Level

Fall 2020
Spring 2021

Volunteer Teaching

Pengshui, high school, Chongqing, China 2016
Yongding, high school, Fujian, China 2017

Service as Journal Referee

- Reviewer for journals: *Statistica Sinica* (2022–2023); *IEEE Transactions on Neural Networks and Learning Systems* (2023–2025); *IEEE Transactions on Information Theory* (2025); *Statistics and Computing* (2024–2025); *Annals of Applied Statistics* (2024–2025); *SCIENCE CHINA Mathematics* (2024); *Acta Mathematica Scientia* (2024); *The American Statistician* (2024); *Applied Mathematics and Computation* (2024); *ScienceAsia* (2025); *Journal of the American Statistical Association* (2025); *Mathematics* (2025); *Artificial Intelligence Review* (2025); *Brain Sciences* (2025); *Electronics* (2025); *Symmetry* (2025); *Journal of Computational and Graphical Statistics* (2025); and *Statistics in Biosciences* (2025).

Seminars & Presentations

- 14th High Dimensional Data Analysis Workshop, taking place at the Central Michigan University Biological Station on Beaver Island, August 19-22, 2025. (invited speaker)
- Graduate Student Seminar, Department of Statistics, George Washington University, Washington, D.C., October 18, 2024. (invited speaker)
- ICSA Applied Statistics Symposium, Nashville, Tennessee, June 16-19, 2024. (invited speaker)
- The 7th International Conference on Statistical Optimization and Learning, Beijing Jiaotong University, Beijing, China, December 2022. (invited speaker)
- Data Science Frontiers Forum, Southwestern University of Finance and Economics, Chengdu, China, July 2021. (invited speaker)

Skills

- Programming languages: Python, R, C++, Bash, \LaTeX , MATLAB, SQL
- Languages: Chinese, English, Eastern Min

References

Dr. Liping Zhu — Ph.D. Advisor

- Professor of Statistics
- Institute of Statistics and Big Data, Renmin University of China
- Email: zhu.liping@ruc.edu.cn

Dr. Peter Song — Postdoc Advisor

- Professor of Biostatistics
- Department of Biostatistics, University of Michigan, Ann Arbor
- Email: pxsong@umich.edu

Dr. Hui Zou — Collaborator

- Professor of Statistics

- School of Statistics, University of Minnesota
- *Email*: zouxx019@umn.edu