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 — **Ann Arbor**
Postdoctoral Research Fellow — *August, 2023 –*

Education

Renmin University of China — **Beijing**
Ph.D. in Statistics — *2018 – 2023*
Dissertation: "Distributed Statistical Algorithms for Nonsmooth Problems: Theories and Applications"

Beijing Normal University — **Beijing**
B.Sc. in Mathematics and Applied Mathematics — *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 Convoluted 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 Convoluted 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**[†]. "Convoluted 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 *Fall 2020*

Natural Language Processing – Ph.D. Level *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