

Canyi Chen

 canyic@umich.edu •  canyi-chen.github.io
 canyi-chen-b031a228b •  0000-0002-0673-5812 •  Chen_Canyi
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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 **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 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

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| <i>Excellent Doctoral Dissertation Award of Renmin University of China</i> | 2024 |
| <i>UMPDA Conference Award, University of Michigan</i> | 2024 |
| <i>National Scholarship of China</i> | 2023 |
| <i>Outstanding Graduate of Renmin University of China</i> | 2023 |
| <i>Wu Yuzhang Scholarship Finalist</i> | 2023 |
| <i>Jingdong Special Scholarship Finalist</i> | 2022 |
| <i>The Best Presented Poster</i> | 2020 |
| Distributed Decoding from Heterogeneous 1-Bit Compressive Measurements
<i>Statistics and Data Science Young Scholars Forum, Beijing. [pdf]</i> | |
| <i>National Second Prize in National Undergraduate Mathematical Modeling Contest</i> | 2016 |

Volunteer Experience

Teaching Assistant

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

<i>Asymptotic Statistics – Ph.D. Level</i>	<i>Fall 2020</i>
<i>Natural Language Processing – Ph.D. Level</i>	<i>Spring 2021</i>

Volunteer Teaching	
<i>Pengshui, high school, Chongqing, China</i>	<i>2016</i>
<i>Yongding, high school, Fujian, China</i>	<i>2017</i>

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, L^AT_EX, 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