

# Canyi Chen

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## Experience

**Department of Biostatistics, University of Michigan**  
*Postdoc Researcher*

**Ann Arbor**  
2023 –

## Education

**Renmin University of China**  
*PhD in Statistics*

**Beijing**  
2018 – 2023

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

**Beijing Normal University**  
*BSc in Mathematics and Applied Mathematics*

**Beijing**  
2014 – 2018

## Research Interests

○ Distributed statistical computing; High-dimensional data analysis; Non-Linear dependence measure

## Publications

### Journal Articles

\* indicates equal contributions

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

**boldface** indicates me

- [1] W. Hao, **C. Chen**, and P. X.-K. Song<sup>†</sup>. “A Class of Directed Acyclic Graphs with Mixed Data Types in Mediation Analysis”. In: *Canadian Journal of Statistics* (2025). accepted.
- [2] N. Qiao\*, **C. Chen**<sup>\*†</sup>, and Z. Zhu\*. “Robust and Efficient Sparse Learning over Networks: A Decentralized Surrogate Composite Quantile Regression Approach”. In: *Statistics and Computing* 35.1 (Jan. 2025), p. 24.
- [3] B. Chen and **C. Chen**<sup>†</sup>. “Convolved Support Matrix Machine in High Dimensions”. In: *Statistica Sinica* (2024). DOI: 10.5705/ss.202024.0194.
- [4] **C. Chen**<sup>†</sup>. “Scalable and Globally Convergent Algorithm for Sufficient Dimension Reduction”. In: *Statistics and Its Interface* 17.3 (July 2024), pp. 479–491.
- [5] **C. Chen**\*, B. Chen\*, L. Kong, and L. Zhu<sup>†</sup>. “Robust Multi-Task Learning in High Dimensions under Memory Constraint”. In: *Statistical Analysis and Data Mining* 17 (3 2024), e11700. DOI: 10.1002/sam.11700.

- [6] **C. Chen** and Z. Zhu<sup>†</sup>. “Byzantine-Robust and Efficient Distributed Sparsity Learning: A Surrogate Composite Quantile Regression Approach”. In: *Statistics and Computing* 34.5 (Oct. 2024), p. 158.
- [7] Y. He, **C. Chen**, and W. Xu<sup>†</sup>. “Debiased Distributed Quantile Regression in High Dimensions”. In: *Statistics and Its Interface* 17.3 (2024), pp. 337–347.
- [8] N. Qiao and **C. Chen**<sup>†</sup>. “Fast and Robust Low-Rank Learning over Networks: A Decentralized Matrix Quantile Regression Approach”. In: *Journal of Computational and Graphical Statistics* 33.4 (Oct. 2024), pp. 1214–1223.
- [9] 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 (July 2023), pp. 69–102.
- [10] **C. Chen**<sup>\*</sup>, Y. Gu<sup>\*</sup>, H. Zou<sup>\*</sup>, and L. Zhu<sup>\*†</sup>. “Distributed Sparse Composite Quantile Regression in Ultrahigh Dimensions”. In: *Statistica Sinica* 33 (2023). DOI: 10.5705/ss.202022.0095.
- [11] 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 (July 2022), p. 104991. DOI: 10.1016/j.jmva.2022.104991.
- [12] **C. Chen** and L. Zhu<sup>†</sup>. “Distributed Decoding from Heterogeneous 1-Bit Compressive Measurements”. In: *Journal of Computational and Graphical Statistics* 32.3 (Aug. 2022), pp. 884–894. DOI: 10.1080/10618600.2022.2118751.
- [13] Y. Zhang, C. Chen, and L. Zhu. “Sliced Independence Test”. In: *Statistica Sinica* 32 (2022). DOI: 10.5705/ss.202021.0203.
- [14] 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 (June 2020), pp. 321–330. DOI: 10.3969/j.issn.1001-4268.2020.03.007.

## Preprints.....

- [15] **C. Chen**, R. Kundu, W. Hao, and P. X.-K. Song. “Copula Structural Equation Models for Mediation Pathway Analysis”. 2025.
- [16] **C. Chen**<sup>\*</sup>, N. Qiao<sup>\*</sup>, and L. Zhu<sup>\*†</sup>. “Efficient Distributed Learning over Decentralized Networks with Convolved Support Vector Machine”. Mar. 2025. arXiv: 2503.07563 [stat].
- [17] **C. Chen**, L. Zhou, and P. X.-K. Song. “An Efficient Two-Way Cross Test for Mediation Effects with High Sensitivity to Weak Signals”. submitted. 2025.
- [18] R. Kundu<sup>\*</sup>, **C. Chen**<sup>\*</sup>, and P. X.-K. Song<sup>†</sup>. “Statistical Inference for Causally Ordered Multiple Mediation Analysis”. 2025.
- [19] B. Chen and **C. Chen**<sup>†</sup>. “A Unified and Efficient Algorithm for Penalized Convolved Support Vector Machines”. submitted. 2024.
- [20] **C. Chen**, Y. He, H. J. Wang, G. Xu, and P. X.-K. Song<sup>†</sup>. “Quantile Mediation Analytics”. submitted. Dec. 2024. arXiv: 2412.15401 [stat].

- [21] **C. Chen**<sup>\*</sup>, Z. Zhu<sup>\*</sup>, and L. Zhu<sup>\*†</sup>. “Robust and Efficient Decoding from Heterogeneous 1-Bit Compressive Measurements over Networks”. major revision at Statistica Sinica. 2024.
- [22] C. He<sup>\*</sup>, **C. Chen**<sup>\*</sup>, and L. Zhu<sup>†</sup>. “A Goodness-of-fit Assessment for General Learning Procedure in High Dimensions”. major revision at JASA. 2024.
- [23] M. Al-Hinai, **C. Chen**, E. C. Jansen, K. E. Peterson, P. X.-K. Song, and A. Baylin. “Vitamin D is Associated with Sleep Disturbance and Cognitive Function in Older Adults”. 2024.
- [24] N. Qiao, W. Li, J. Zhang, and **C. Chen**<sup>†</sup>. “Scalable and Distributed Individualized Treatment Rules for Massive Datasets”. major revision at Biometrics. 2024.
- [25] **C. Chen** and L. Zhu<sup>†</sup>. “Distributed Estimation and Gap-Free Analysis of Canonical Correlations”. submitted. Dec. 2023. arXiv: 2412.17792 [stat].

## Open-Source Software

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- SIT: ASSOCIATION MEASUREMENT THROUGH SLICED INDEPENDENCE TEST. [Link]
- abima: ADAPTIVE BOOTSTRAP INFERENCE FOR MEDIATION ANALYSIS WITH ENHANCED STATISTICAL POWER. [Link]
- MarginalMaxTest: TEST THE MARGINAL CORRELATION BETWEEN A SCALAR RESPONSE VARIABLE WITH A VECTOR OF EXPLANATORY VARIABLES USING THE MAX-TYPE TEST WITH BOOTSTRAP. [Link]

## Grant Proposals

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### 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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*Excellent Doctoral Dissertation Award of Renmin University of China* 2024

*UMPDA Conference Award* 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

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### Teaching Assistant

*Computer Skills in Data Science – PhD Level* Fall 2019

### Anonymous Referee.....

- *Statistica Sinica* (22, 23)
- *IEEE Transactions on Neural Networks and Learning Systems* (23, 24, 25)
- *Statistics and Computing* (24, 25)
- *Annals of Applied Statistics* (24, 25)
- *SCIENCE CHINA Mathematics* (24)
- *Acta Mathematica Scientia* (24)
- *The American Statistician* (24)
- *Applied Mathematics and Computation* (24)
- *ScienceAsia* (25)
- *Journal of the American Statistical Association* (25)
- *Mathematics* (25)

### Seminars & Presentations

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- 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

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