

Kangjie Zhou

CONTACT INFORMATION

Department of Statistics
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ACADEMIC POSITIONS

Columbia University

Founder's Postdoctoral Research Fellow

New York, NY

August 2024-present

EDUCATION

Stanford University

Ph.D. in Statistics, Advisor: Andrea Montanari

Stanford, CA

2019–2024

Peking University

B.S. in Mathematics, Minor in Economics

Beijing, China

2015–2019

RESEARCH INTERESTS

High-dimensional Statistics, Probability Theory, Deep Learning, and Causal Inference

PUBLICATIONS AND PREPRINTS

- [1] Andrea Montanari*, Yiqiao Zhong*, and Kangjie Zhou*. Tractability from overparametrization: The example of the negative perceptron. *Probability Theory and Related Fields*, vol. 188, no. 3, pp. 805–910, 2024.
- [2] Raphaël Berthier*, Andrea Montanari*, and Kangjie Zhou*. Learning time-scales in two-layers neural networks. *Foundations of Computational Mathematics*, pp. 1–84, 2024.
- [3] Shuangping Li*, Tselil Schramm*, and Kangjie Zhou*. Discrepancy algorithms for the binary perceptron. *arXiv preprint 2408.00796*, 2024.
- [4] Andrea Montanari* and Kangjie Zhou*. Which exceptional low-dimensional projections of a gaussian point cloud can be found in polynomial time? *arXiv preprint 2406.02970*, 2024.
- [5] Fangyi Chen*, Yunxiao Chen*, Zhiliang Ying*, and Kangjie Zhou*. Dynamic factor analysis of high-dimensional recurrent events. *arXiv preprint 2405.19803*, Under major revision at *Biometrika*, 2024.
- [6] Yuchen Wu* and Kangjie Zhou*. Sharp analysis of power iteration for tensor pca. *Journal of Machine Learning Research*, vol. 25, no. 195, pp. 1–42, 2024.
- [7] Yuchen Wu* and Kangjie Zhou*. Lower bounds for the convergence of tensor power iteration on random overcomplete models. in *Conference on Learning Theory*, pp. 3783–3820, PMLR, 2023.

- [8] Andrea Montanari* and Kangjie Zhou*. Overparametrized linear dimensionality reductions: From projection pursuit to two-layer neural networks. *arXiv preprint 2206.06526*, 2022.
- [9] Kangjie Zhou and Andrea Montanari. High-dimensional projection pursuit: Outer bounds and applications to interpolation in neural networks. in *Conference on Learning Theory*, pp. 5525–5527, PMLR, 2022.
- [10] Kangjie Zhou and Jinzhu Jia. Propensity score adapted covariate selection for causal inference. *arXiv preprint 2109.05155*, 2021.

(*Author names ordered alphabetically)

WORKING PAPERS

- [1] Andrea Montanari and Kangjie Zhou. Algorithmic thresholds for high-dimensional multi-index models. *Manuscript available upon request.*
- [2] Kangjie Zhou and Ming Yuan. A statistical theory of empirical CVaR for portfolio selection. *Manuscript available upon request.*
- [3] Jingyang Lyu, Kangjie Zhou, and Yiqiao Zhong. A modern statistical theory of overfitting for imbalanced classification. *Manuscript available upon request.*
- [4] Yuhang Cai, Kangjie Zhou, Jingfeng Wu, Song Mei, Michael Lindsay, and Peter Bartlett. Implicit bias of gradient descent for near homogeneous networks. *Manuscript available upon request.*
- [5] Kangjie Zhou. Overlap gap property for the negative spherical perceptron. *Manuscript available upon request.*
- [6] Kangjie Zhou, Jinzhu Jia, and Peng Ding. Improved covariate-adjusted average treatment effect estimate via generalized analysis of covariance. *Manuscript available upon request.*

TALKS AND PRESENTATIONS

- Dynamic factor analysis of high-dimensional recurrent events
International Conference on Statistics and Data Science, Nice, France *December 2024*
- Dynamic factor analysis of high-dimensional recurrent events
Statistics Seminar, London School of Economics and Political Science *December 2024*
- Dynamic factor analysis of high-dimensional recurrent events
Statistics Seminar, New Jersey Institute of Technology *November 2024*
- Learning time-scales in two-layers neural networks
Joint Statistical Meetings, Portland, Oregon *August 2024*
- Discrepancy algorithms for the binary perceptron
Statistics Seminar, Chinese Academy of Sciences *July 2024*
- Learning time-scales in two-layers neural networks
Statistics Seminar, Peking University *July 2024*
- Discrepancy algorithms for the binary perceptron
Stanford CS Theory Lunch Talk *May 2024*
- Discrepancy algorithms for the binary perceptron
MoDL Workshop at UCSD *May 2024*

- Learning time-scales in two-layers neural networks
Statistics Seminar, Chinese Academy of Sciences *November 2023*
- Lower bounds for the convergence of tensor power iteration on random overcomplete models
Conference on Learning Theory *July 2023*
- Learning time-scales in two-layers neural networks
MoDL Meeting at TTIC *May 2023*
- Learning time-scales in two-layers neural networks
Statistics Seminar, Wuhan University *March 2023*
- From projection pursuit to interpolation in two-layer neural networks
Stanford-Berkeley Joint Colloquium *November 2022*
- High-dimensional projection pursuit: outer bounds and applications to interpolation in neural networks
Conference on Learning Theory *July 2022*

TEACHING

Teaching Assistant at Stanford University

- STATS 207 - Time Series Analysis 2020 Spring
- STATS 202 - Data Mining and Analysis 2020 Summer
- STATS 116 - Theory of Probability 2020 Fall
- STATS 214/CS 229M - Machine Learning Theory 2021 Winter
- STATS 204 - Sampling 2021 Spring
- STATS 263/363 - Experimental Design 2021 and 2022 Fall
- Math 230B/Stat 310B - Theory of Probability II 2023 Winter
- STATS 218 - Introduction to Stochastic Processes II 2022 and 2023 Spring
- STATS 141 - Biostatistics 2024 Winter

PROFESSIONAL SERVICES

- Reviewer for conferences: Conference on Learning Theory (2023, 2024, 2025), International Conference on Algorithmic Learning Theory (2025), International Conference on Artificial Intelligence and Statistics (2025)
- Reviewer for journals: *Annals of Applied Probability* (2), *SIAM Journal on Mathematics of Data Science* (1)

INDUSTRY EXPERIENCE

The Voleon Group Berkeley, CA
 Research Intern Summer 2023

AWARDS AND HONORS

- Probability Thesis Award, Stanford University 2024
- Alibaba Global Mathematics Competition, Gold medal 2021
- S.T. Yau Mathematics Competition for College Students, Gold medal in Probability and Statistics 2017
- National Scholarship, Peking University 2016–2017
- Chinese Mathematical Olympiad, First prize 2014