Kaizheng Wang

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ACADEMIC POSITION

Columbia University, New York, NY, USA Jul. 2020 -

Assistant Professor, Department of Industrial Engineering and Operations Research

Member, Data Science Institute

EDUCATION

Princeton University, Princeton, NJ, USA Sep. 2015 - Jun. 2020

Ph.D. in Operations Research and Financial Engineering, Department of ORFE

Peking University, Beijing, China Sep. 2011 - Jul. 2015

B.S. in Mathematics and Applied Mathematics, School of Mathematical Sciences

PUBLICATIONS AND PREPRINTS

(α-β: author names are sorted alphabetically; †: student/postdoc supervised.)

Preprints

- A Minimalist Bayesian Framework for Stochastic Optimization.
  Kaizheng Wang.
  arXiv:2509.07030, 2025.
- Transfer Learning of CATE with Kernel Ridge Regression.
  Seok-Jin Kim†, Hongjie Liu, Molei Liu, Kaizheng Wang.
  arXiv:2502.11331, 2025.
- A Particle Algorithm for Mean-Field Variational Inference.
  Qiang Du, Kaizheng Wang, Edith Zhang, Chenyang Zhong. (α-β)
  arXiv:2412.20385, 2024.
- Localized Exploration in Contextual Dynamic Pricing Achieves Dimension-Free Regret.
  Jinhang Chai, Yaqi Duan, Jianqing Fan, Kaizheng Wang. (α-β)
  arXiv:2412.19252, 2024.

- Adaptive Transfer Clustering: A Unified Framework.
  Yuqi Gu, Zhongyuan Lyu†, Kaizheng Wang. (α-β)
  arXiv:2410.21263, 2024.

- Distribution-Free Predictive Inference under Unknown Temporal Drift.
  Elise Han†, Chengpiao Huang†, Kaizheng Wang. (α-β)
  arXiv:2406.06516, 2024.

- Variable Clustering via Distributionally Robust Nodewise Regression.
  Kaizheng Wang, Xiao Xu, Xun Yu Zhou. (α-β)
  arXiv:2212.07944, 2022.

- Adaptive Data Fusion for Multi-Task Non-Smooth Optimization.
  Henry Lam, Kaizheng Wang, Yuhang Wu†, Yichen Zhang. (α-β)
  arXiv:2210.12334, 2022.

Journal publications

- Pseudo-Labeling for Kernel Ridge Regression under Covariate Shift.
  Kaizheng Wang.
  Annals of Statistics (accepted), 2025+.
  Junior Researcher Award, 2024 ICSA China Conference.

- A Stability Principle for Learning under Non-Stationarity.
  Chengpiao Huang†, Kaizheng Wang. (α-β)
  Operations Research (accepted), 2025+.

- Clustering a Mixture of Gaussians with Unknown Covariance.
  Damek Davis, Mateo Díaz, Kaizheng Wang. (α-β)
  Bernoulli 31 (3): 2105-2126, 2025.

- Learning Gaussian Mixtures Using the Wasserstein-Fisher-Rao Gradient Flow.
  Yuling Yan*, Kaizheng Wang*, Philippe Rigollet. (* = equal contribution)
  Annals of Statistics 52 (4): 1774-1795, 2024.

- Adaptive and Robust Multi-Task Learning.
  Yaqi Duan, Kaizheng Wang. (α-β)
  Annals of Statistics 51 (5): 2015-2039, 2023.

- Communication-Efficient Accurate Statistical Estimation.
  Jianqing Fan, Yongyi Guo, Kaizheng Wang. (α-β)
  Journal of American Statistical Association 118 (542): 1000-1010, 2023.

- An ℓ_p Theory of PCA and Spectral Clustering.
  Emmanuel Abbe, Jianqing Fan, Kaizheng Wang. (α-β)
  Annals of Statistics 50 (4): 2359-2385, 2022.
  Frontiers of Science Award in Mathematics, 2024 International Congress of Basic Science.

- Modern Data Modeling: Cross-Fertilization of the Two Cultures.
  Jianqing Fan, Cong Ma, Kaizheng Wang, Ziwei Zhu. (α-β)
  Observational Studies 7 (1): 65-76, 2021.

- Robust High Dimensional Factor Models with Applications to Statistical Machine Learning.
  Jianqing Fan, Kaizheng Wang, Yiqiao Zhong, Ziwei Zhu. (α-β)
  Statistical Science 36 (2): 303-327, 2021.

- Entrywise Eigenvector Analysis of Random Matrices with Low Expected Rank.
  Emmanuel Abbe, Jianqing Fan, Kaizheng Wang, Yiqiao Zhong. (α-β)
  Annals of Statistics 48 (3): 1452-1474, 2020.

- Implicit Regularization in Nonconvex Statistical Estimation: Gradient Descent Converges Linearly for Phase Retrieval, Matrix Completion and Blind Deconvolution.
  Cong Ma, Kaizheng Wang, Yuejie Chi, Yuxin Chen.
  Foundations of Computational Mathematics 20: 451–632, 2020.
  Short version accepted by **International Conference on Machine Learning (ICML)** 2018.
  SIAM Activity Group on Imaging Science Best Paper Prize, 2024.

- Factor-Adjusted Regularized Model Selection.
  Jianqing Fan, Yuan Ke, Kaizheng Wang. (α-β)
  Journal of Econometrics 216 (1): 71-85, 2020.

- Comment on "A Tuning-Free Robust and Efficient Approach to High-Dimensional Regression".
  Jianqing Fan, Cong Ma, Kaizheng Wang. (α-β)
  Journal of American Statistical Association 115 (532): 1720-1725, 2020.

- Distributed Estimation of Principal Eigenspaces.
  Jianqing Fan, Dong Wang, Kaizheng Wang, Ziwei Zhu. (α-β)
  Annals of Statistics 47 (6): 3009-3031, 2019.

- Spectral Method and Regularized MLE are both Optimal for Top-K Ranking.
  Yuxin Chen, Jianqing Fan, Cong Ma, Kaizheng Wang. (α-β)
  Annals of Statistics 47 (4): 2204-2235, 2019.

- Stochastic Representations for the Wave Equation on Graphs and Their Scaling Limits.
  Kaizheng Wang
  Journal of Mathematical Analysis and Applications 449 (1): 808-828, 2017.

- On the Neumann Problem for Harmonic Functions in the Upper Half Plane.
  Kaizheng Wang
  Journal of Mathematical Analysis and Applications 419 (2): 839-848, 2014.

Conference publications

- Uncertainty Quantification for LLM-Based Survey Simulations.
  Chengpiao Huang†, Yuhang Wu†, Kaizheng Wang.
  International Conference on Machine Learning, 2025

- Model Assessment and Selection under Temporal Distribution Shift.
  Elise Han†, Chengpiao Huang†, Kaizheng Wang. (α-β)
  International Conference on Machine Learning, 2024.

- Efficient Clustering for Stretched Mixtures: Landscape and Optimality.
  Kaizheng Wang, Yuling Yan, Mateo Díaz.
  Neural Information Processing Systems, 2020.

- Implicit Regularization in Nonconvex Statistical Estimation: Gradient Descent Converges Linearly for Phase Retrieval and Matrix Completion.
  Cong Ma, Kaizheng Wang, Yuejie Chi, Yuxin Chen.
  International Conference on Machine Learning, 2018.

AWARDS

- ICBS Frontiers of Science Award in Mathematics 2024
- ICSA China Conference Junior Researcher Award 2024
- SIAM Activity Group on Imaging Science Best Paper Prize 2024
- Second Place Award - 2023 INFORMS Blue Summit Supplies Data Challenge 2023

- Harold W. Dodds Fellowship - Princeton University 2019 - 2020
- Gordon Y. S. Wu Fellowship - Princeton University 2015 - 2019
- SEAS Award for Excellence - Princeton University 2018

GRANTS

- Columbia University SEAS GenAI in Education Initiative Grant ($16,000) 2025 – 2026
  Digital Twins of Columbia Engineering Students
  Role: PI
- NSF Grant DMS- 2515679 ($155,000) 2025 – 2028
  Adaptive Data Integration: Harnessing Commonality amidst Heterogeneity
  Role: PI
- NIH Grant 5R01AG087496 ($710,697) 2025 – 2029
  Statistical Framework for Unraveling Age-Dependent Genetic Landscape of Alzheimer's Disease and Related Dementias: Harnessing Large-Scale EHR and DNA-Biobank Integration
  Role: Co-PI
- NSF Grant DMS-2210907 ($179,999) 2022 – 2026
  Statistical and Computational Tools for Analyzing High-Dimensional Heterogeneous Data
  Role: PI
- Columbia University Data Science Institute Seed Fund ($75,000) 2024 – 2025
  Policy Evaluation with Transfer Learning: How to assess safety performance of self-driving cars in NYC?
  Role: Co-PI

PROFESSIONAL ACTIVITIES AND SERVICES

- Area chair/meta-reviewer: AAAI 2025, COLT 2024 - 2025, ICML 2023 - 2025, NeurIPS 2021 - 2022
- Session chair: INFORMS Annual Meeting 2020 - 2025, ICML 2025
- Cluster chair, 2022 CORS-INFORMS International Conference Jun. 2022
- Co-organizer, Berkeley-Columbia Meeting in Engineering and Statistics Oct. 2025
- Co-organizer, Optimization and Statistical Learning Workshop, Columbia University Apr. 2025
- Reviewer for the following journals: Annals of Applied Probability, Annals of Statistics, Bernoulli, Biometrika, Communications on Pure and Applied Mathematics, Foundations of Computational Mathematics, IEEE Transactions on Information Theory, Journal of Business & Economic Statistics, Journal of Econometrics, Journal of Machine Learning Research, Journal of the American Statistical Association, Journal of the Royal Statistical Society: Series B, Management Science, Mathematics of Operations Research, Operations Research, Random Structures & Algorithms, etc.

- Reviewer for the following conferences: Conference on Learning Theory (COLT), International Conference on Machine Learning (ICML), IEEE International Symposium on Information Theory (ISIT), Neural Information Processing Systems (NeurIPS), ACM-SIAM Symposium on Discrete Algorithms (SODA), etc.
- Proposal reviewer for the National Science Foundation (NSF).
- Outreach program: Mentor in the Data Science Research Program for high school students (run by The Coding School in collaboration with Columbia University and other institutes), Jun. - Aug. 2024.

TEACHING EXPERIENCES

- IEOR E8100 - High-Dimensional Probability with Applications (PhD): Spring 21, 23, 24 & 26;
- IEOR E4106 - Stochastic Models (Master): Spring 24;
- IEOR E4102 - Stochastic Modeling for Management Science and Engineering (Master): Spring 23;
- IEOR E4307 - Statistics and Data Analysis (Undergraduate): Fall 20 & 21;
- IEOR E3658 - Probability for Engineers (Undergraduate): Spring 25 & Fall 25;
- IEOR E3106 - Stochastic Systems and Applications (Undergraduate): Fall 21 – 23 & 25.

RESEARCH GROUP

Ph.D. students

- Chengpiao Huang
  Deming Doctoral Fellowship, 2025-2026.
  Best Student Presentation Award, The 38th New England Statistics Symposium (NESS 2025).
  Outstanding Teaching Assistant Award, Department of IEOR, Columbia University, 2025.
  Second Place Award, 2023 INFORMS Blue Summit Supplies Data Challenge.
- Seok-Jin Kim
- Nathan Weill
- Yuhang Wu (co-advised with Assaf Zeevi)
  Second Place Award, 2023 INFORMS Blue Summit Supplies Data Challenge.
- Yu-Shiou Willy Lin (co-advised with Garud Iyengar)

Alumni

- Zhongyuan Lyu (Postdoc co-mentored with Yuqi Gu).
  Lecturer (equivalent to US tenure-track Assistant Professor) of Business Analytics at the University of Sydney Business School.
- Elise Han (Undergraduate)

PhD student in the Computer Science Department at Stanford University.
INFORMS Scholarship and Bonomi Scholarship in 2024.

- Alan Ma (Undergraduate): Data Science Institute scholarship in Spring 2025.
- Caden Lin (Undergraduate)
- Yuxi (Eric) Chen (Undergraduate)
  PhD student in the Department of Statistics and Data Science at Carnegie Mellon University.
- Naomi Toft (Undergraduate)
- Geraldine Nina Montano (Undergraduate): Bonomi Scholarship in 2023.
- Rain Wei (Undergraduate): Bonomi Scholarship in 2023.
- Yuhang Wu (Undergraduate)
  PhD student at the Decision, Risk, and Operations (DRO) division at Columbia Business School. Second Place Award in the 2023 INFORMS Blue Summit Supplies Data Challenge.
- Alice Chen (Master)
- Sara Zhao (Undergraduate): Stephen D. Guarino Memorial Award in 2022.
- Ethan Turok (Undergraduate)