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

Advisor: Jianqing Fan

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

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

PUBLICATIONS AND PREPRINTS

Preprints under review (α-β: author names are sorted alphabetically)

- Learning Gaussian Mixtures Using the Wasserstein-Fisher-Rao Gradient Flow
  Yuling Yan*, Kaizheng Wang*, Philippe Rigollet. (* = equal contribution)
  arXiv: 2301.01766, 2023.
- 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.
- Adaptive and robust multi-task learning.
  Yaqi Duan, Kaizheng Wang. (α-β)
  arXiv:2202.05250, 2022.
- Clustering a mixture of Gaussians with unknown covariance.

Damek Davis, Mateo Díaz, Kaizheng Wang. (α-β)
arXiv:2110.01602, 2021.

Journal publications

- 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.
- Communication-efficient accurate statistical estimation.
  Jianqing Fan, Yongyi Guo, Kaizheng Wang. (α-β)
  Journal of American Statistical Association, Accepted, 2021+.
- 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.
- 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

- Efficient clustering for stretched mixtures: landscape and optimality.
  Kaizheng Wang, Yuling Yan, Mateo Díaz.
  Neural Information Processing Systems (NeurIPS) 33: 21309-21320, 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 (ICML) 80: 3345-3354, 2018.

GRANTS AND AWARDS

- NSF Grant DMS-2210907 ($179,999), Role: Principal Investigator — 2022 – 2025
  Statistical and Computational Tools for Analyzing High-Dimensional Heterogeneous Data
- Harold W. Dodds Fellowship (1%) - Princeton University — 2019 - 2020
- Gordon Y. S. Wu Fellowship - Princeton University — 2015 - 2019
- SEAS Award for Excellence - Princeton University — 2018

PROFESSIONAL SERVICES

- Area chair, ICML 2023 — Jul. 2023
- Area chair, NeurIPS 2022 — Dec. 2022
- Session chair, INFORMS Annual Meeting 2022 — Oct. 2022
- Cluster chair, 2022 CORS-INFORMS International Conference — Jun. 2022
- Area chair, NeurIPS 2021 — Dec. 2021
- Session chair, INFORMS Annual Meeting 2021 — Oct. 2021

- Session chair, INFORMS Annual Meeting 2020 Nov. 2020
- Co-organizer, Wilks statistics seminar, Princeton University Jul. 2018 - May. 2019
- Co-organizer, the 6th Princeton Day of Statistics Jul. 2018 - Nov. 2018
- Reviewer for the following journals: Annals of Statistics, Biometrika, Foundations of Computational Mathematics, 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, Mathematics of Operations Research, Operations Research, 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.

TEACHING EXPERIENCES

At Columbia University:

- IEOR E8100 - High-Dimensional Probability with Applications (PhD): Spring 2021, Spring 2023;
- IEOR E4102 - Stochastic Modeling for Management Science and Engineering (Master): Spring 2023;
- IEOR E4307 - Statistics and Data Analysis (Undergraduate): Fall 2020, Fall 2021;
- IEOR E3106 - Stochastic Systems and Applications (Undergraduate): Fall 2021, Fall 2022.

At Princeton University, as Assistants in Instruction (AIs):

- ORF 525 - Statistical Learning and Nonparametric Estimation (Graduate): Spring 2019;
- ORF 363 - Computing and Optimization for Physical and Social Sciences (Undergraduate): Fall 2016;
- ORF 309 - Probability and Stochastic Systems (Undergraduate): Spring 2017, Spring 2018;
- ORF 245 - Fundamentals of Statistics (Undergraduate): Fall 2017, Fall 2018 (Head AI).