Weihao Kong

✉ kweihao@gmail.com
🖥 cs.stanford.edu/~weihaokong

Research Interests

My current research focuses on applying ideas and insights from probability theory and random matrix theory to yield algorithms for accurately inferring information about large/complex distribution, given surprisingly little data. In general my goal is to design algorithms that are computationally efficient and information theoretically optimal—in that they use the available data as effectively as possible. More broadly, I am interested in problems spanning machine learning, high-dimensional statistics, random matrix theory and theoretical computer science.

Education

2013–2019	**Ph.D.**, *Computer Science*, Stanford University.
2009–2013	**Bachelor of Engineering**, *ACM-Honored class of Computer Science*, Shanghai Jiao Tong University.

Teaching Experience

Teaching Assistant

Spring 2017	**CS168 Modern Algorithmic Toolbox**, *Instructor: Tim Roughgarden and Gregory Valiant.*
Fall 2015	**CS265 Randomized Algorithms and Probabilistic Analysis**, *Instructor: Gregory Valiant.*
Spring 2015	**CS261 Optimization and Algorithmic Paradigms**, *Instructor: Tim Roughgarden.*
Fall 2014	**CS265 Randomized Algorithms and Probabilistic Analysis**, *Instructor: Gregory Valiant.*

Professional Experience

July 2018 - Aug 2018	**Summer research on learning populations of parameters with Sham M. Kakade.** University of Washington
Jun 2017 - Aug 2017	**Summer research on robust statistics with Ilias Diakonikolas.** University of Southern California
Jun 2014 - Sep 2014	**Research on nonparametric Bayesian approaches to clustering, advised by Bo-June(Paul) Hsu.** Microsoft Research, Redmond
Aug 2012 - April 2013	**Research on an allocation algorithm for display advertising, advised by Tao Qin.** Microsoft Research Asia, IECA group

Services

Conference reviewer, *COLT17, SODA18, ITCS18, AAAI 18, ICML 19, FOCS 19, NeurIPS 19.*

Journel reviewer, *Biometrika, Journal of Machine Learning Research (JMLR), Transactions on Pattern Analysis and Machine Intelligence (TPAMI).*

Organizer, *Stanford Theory Seminar 16-17.*

Talks

Learning Populations of Parameters.
- Stanford Theory Lunch, April 2019
- ITA'19, Feb 2019

Efficient Algorithms and Lower Bounds for Robust Linear Regression.
- Stanford ML Lunch, Jan 2019
- SODA '19, Jan 2019
- TTI-Chicago Summer Workshop, Aug 2018

Estimating Learnability in the Sublinear Data Regime.
- Simons Workshop: Foundations of Data Science, Nov 2018
- TOCA-SV, Nov 2018
- University of Washington, July 2018
- Stanford ML Lunch, April 2018

Estimating the Covariance Spectrum.
- Nanjing University, Sep 2017
- Microsoft Research Asia, Beijing, Aug 2017
- University of Southern California, July 2017
- TOCA-SV, May 2017
- UPenn Warton Seminars, April 2017
- IDeAS Seminar at Princeton University, April 2017
- China Theory Week, Aug 2016
- Stanford ML Lunch, Jan 2016
- Stanford Theory Lunch, Dec 2015

Approximating the Spectrum of a Graph.
- KDD'18, Aug 2018

Recovering Structured Probability Matrices.
- ITCS'18, Jan 2018
- Stanford Theory Lunch, Feb 2017

Publications

Ramya Korlakai Vinayak, Weihao Kong, Gregory Valiant and Sham M. Kakade. Maximum Likelihood Estimation for Learning Populations of Parameters. *arXiv preprint arXiv:1902.04553*, 2019.

Ilias Diakonikolas, Weihao Kong, and Alistair Stewart. Efficient algorithms and lower bounds for robust linear regression. *In ACM-SIAM Symposium on Discrete Algorithms (**SODA**)*, 2019.

Weihao Kong and Gregory Valiant. Estimating learnability in the sublinear data regime. *In Advances in Neural Information Processing Systems (**NeurIPS**)*, 2018.

David Cohen-Steiner, Weihao Kong, Christian Sohler, and Gregory Valiant. Approximating the spectrum of a graph. In *Proceedings of the 24th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining (**KDD**)*. ACM, 2018.

Qingqing Huang, Sham M. Kakade, Weihao Kong, and Gregory Valiant. Recovering Structured Probability Matrices. In *9th Innovations in Theoretical Computer Science Conference (**ITCS**)*, 2018.

Kevin Tian, Weihao Kong, and Gregory Valiant. Learning populations of parameters. In *Advances in Neural Information Processing Systems (**NIPS**)*, 2017.

Weihao Kong, Gregory Valiant, et al. Spectrum estimation from samples. ***The Annals of Statistics***, 45(5):2218–2247, 2017.

Weihao Kong, Jian Li, Tie-Yan Liu, and Tao Qin. Optimal allocation for chunked-reward advertising. In *Web and Internet Economics (**WINE**)*. Springer, 2013.

Weihao Kong and Wu-Jun Li. Isotropic hashing. In *Advances in Neural Information Processing Systems 25 (**NIPS**)*, 2012.

Weihao Kong, Wu-Jun Li, and Minyi Guo. Manhattan hashing for large-scale image retrieval. In *Proceedings of the 35th International ACM SIGIR Conference on Research and Development in Information Retrieval (**SIGIR**)*, 2012.

Weihao Kong and Wu-Jun Li. Double-bit quantization for hashing. In *Proceedings of the Twenty-Sixth AAAI Conference on Artificial Intelligence (**AAAI**)*, 2012.