Tianhao Wang

CONTACT INFORMATION

Yale University
24 Hillhouse Avenue
New Haven, CT 06511
Phone: 203-305-9456

✉ tianhao.wang@yale.edu
Homepage
Linkedin
Google Scholar

EDUCATION

Yale University, New Haven, CT — 2018–present

- Ph.D. in Statistics and Data Science
- Advisor: Prof. Zhou Fan

University of Science and Technology of China (USTC), Hefei, China — 2014–2018

- B.S. in Mathematics
- B.E. in Computer Science (dual)

EXPERIENCE

Research Intern, Google Deepmind — Summer 2023

- Project: Efficient Transformers for encoding long sequence of user activities
- Mentors: Jacob Conrad Trinidad, Jianmo Ni, Wang-Cheng Kang

RESEARCH INTERESTS

- *Approximate Message Passing algorithms*
- *Optimization and deep learning theory*
- *Data-driven decision making problems*
- *Orbit recovery problems*

PREPRINTS

(*: equal contribution)

3. Runzhe Wang, Sadhika Malladi, **Tianhao Wang**, Kaifeng Lyu, and Zhiyuan Li. "The Marginal Value of Momentum for Small Learning Rate SGD". Available at arXiv:2307.15196.
2. **Tianhao Wang**, Xinyi Zhong, Zhou Fan. "Universality of Approximate Message Passing algorithms and tensor networks". *Submitted to The Annals of Applied Probability*, minor revision. Available at arXiv:2206.13037.
1. Xinyi Zhong*, **Tianhao Wang***, Zhou Fan. ''Approximate Message Passing for orthogonally invariant ensembles: Multivariate non-linearities and spectral initialization". *Submitted to Information and Inference*, minor revision. Available at arXiv:2110.02318.

PUBLICATIONS

(*: equal contribution)

16. Ruitu Xu, Yifei Min, and **Tianhao Wang**. "Noise-adaptive Thompson sampling for linear contextual bandits". *In Advances in Neural Information Processing Systems (NeurIPS)*, 2023.
15. Zhou Fan, Roy R. Lederman, Yi Sun, **Tianhao Wang**, Sheng Xu. ''Maximum likelihood for high-noise group orbit estimation and single-particle cryo-EM". *The Annals of Statistics*, to appear. Available at https://arxiv.org/abs/2107.01305.
14. Yifei Min, Jiafan He, **Tianhao Wang**, Quanquan Gu. "Cooperative Multi-Agent Reinforcement Learning: Asynchronous Communication and Linear Function Approximation". *International Conference on Machine Learning (ICML), 2023.*
13. Ruitu Xu, Yifei Min, **Tianhao Wang**, Michael I. Jordan, Zhaoran Wang, Zhuoran Yang. "Finding Regularized Competitive Equilibria of Heterogeneous Agent Macroeconomic Models via Reinforcement Learning". *International Conference on Artificial Intelligence and Statistics (AISTATS), 2023.*

12. Zhiyuan Li, **Tianhao Wang**, Dingli Yu. "Fast Mixing of Stochastic Gradient Descent with Normalization and Weight Decay". *In Advances in Neural Information Processing Systems (NeurIPS)*, 2022.

11. Zhiyuan Li*, **Tianhao Wang***, Jason D. Lee, Sanjeev Arora. "Implicit bias of gradient descent on reparametrized models: on equivalence to mirror descent". *In Advances in Neural Information Processing Systems (NeurIPS)*, 2022.

10. Jiafan He*, **Tianhao Wang***, Yifei Min*, Quanquan Gu. "A simple and provably efficient algorithm for asynchronous federeted linear bandits". *In Advances in Neural Information Processing Systems (NeurIPS)*, 2022.

9. Yifei Min, **Tianhao Wang**, Ruitu Xu, Zhaoran Wang, Michael I. Jordan, Zhuoran Yang. "Learn to match with no regret: Reinforcement learning in Markov matching market". *In Advances in Neural Information Processing Systems (NeurIPS)*, 2022. **(Oral)**

8. Yifei Min, Jiafan He, **Tianhao Wang**, Quanquan Gu. "Learning stochastic shortest path with linear function approximation". *International Conference on Machine Learning (ICML)*, 2022.

7. Zhiyuan Li, **Tianhao Wang**, Sanjeev Arora. "What happens after SGD reaches zero loss? – A mathematical framework". *International Conference on Learning Representations (ICLR)*, 2022. **(Spotlight)**

6. Zhou Fan, Yi Sun, **Tianhao Wang**, Yihong Wu. "Likelihood landscape and maximum likelihood estimation for the discrete orbit recovery model". *Communications on Pure and Applied Mathematics*, 2022.

5. Pamela L Valentino, **Tianhao Wang**, Veronika Shabanova, Vicky Lee Ng, John C Bucuvalas, Amy G Feldman, Regino P Gonzalez-Peralta, Nitika Arora Gupta, Tamir A Miloh, Saeed Mohammad, Erika Pace, Shikha S Sundaram, Nada A Yazigi, Kyle Soltys, Society of Pediatric Liver Transplantation (SPLIT). "North American biliary stricture management strategies in children post liver transplant: multicenter analysis from the SPLIT Registry". *Liver Transplatation*, 2021.

4. Yifei Min*, **Tianhao Wang***, Dongruo Zhou, Quanquan Gu. "Variance-aware off-policy evaluation with linear function approximation". *In Advances in Neural Information Processing Systems (NeurIPS)*, 2021.

3. **Tianhao Wang***, Dongruo Zhou*, Quanquan Gu. "Provably efficient reinforcement learning with linear function approximation under adaptivity constraints". *In Advances in Neural Information Processing Systems (NeurIPS)*, 2021.

2. Pan Xu*, **Tianhao Wang***, Quanquan Gu. "Continuous and discrete-time accelerated stochstic mirror descent for strongly convex functions". *International Conference on Machine Learning (ICML)*, 2018.

1. Pan Xu*, **Tianhao Wang***, Quanquan Gu. "Accelerated stochastic mirror descent: From continuous-time dynamics to discrete-time algorithms". *International Conference on Artificial Intelligence and Statistics (AISTATS)*, 2018.

Honors and Awards

- Poster award in Conference on Recent Advances in Statistics and Data Science 2023
- NeurIPS 2022 top reviewer NeurIPS, 2022
- Wedworth W. Clarke Fellowship Yale, 2021
- ICML 2018 travel award ICML, 2018
- Huang Yu Memorial Scholarship USTC, 2017

Teaching Experience

- High-Dimensional Phenomena in Statistics and Learning — Spring 2023
- Intermediate Machine Learning — Spring 2022
- Statistical Inference — Fall 2020, Fall 2021
- Information Theory — Spring 2021
- Probability and Statistics — Fall 2019
- Stochastic Processes — Spring 2019, Spring 2020

Service

- Conference reviewer
  - AISTATS 2022, 2023, 2024
  - ECML 2023
  - ICLR 2023, 2024
  - ICML 2022, 2023
  - IEEE ITW 2023
  - NeurIPS 2022, 2023
- Journal reviewer
  - IEEE Transactions on Information Theory
  - The Annals of Statistics