Yanjun Han

CONTACT
INFORMATION

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RESEARCH
INTERESTS

- statistical machine learning
- high-dimensional and nonparametric statistics
- information theory
- online learning and bandits
- optimization
- probability theory

EDUCATION

Stanford University, Stanford, CA, USA

Ph.D. Candidate, Electrical Engineering

- Sept. 2015 - Present (Expected: Jun. 2021)
- Advisor: Prof. Tsachy Weissman
- Co-advisor: Prof. Andrea Montanari

M.S., Electrical Engineering

- Sept. 2015 - Jun. 2017
- Advisor: Prof. Tsachy Weissman

Tsinghua University, Haidian, Beijing, China

B.E., Electronic Engineering, Aug. 2011 - Jul. 2015

B.S., School of Economics and Management (second degree), Sept. 2012 - Jul. 2015

PREPRINTS

(† stands for alphabetical order)

P7. Nived Rajaraman, **Yanjun Han**, Lin F. Yang, Kannan Ramchandran, Jiantao Jiao, "Provably Breaking the Quadratic Error Compounding Barrier in Imitation Learning, Optimally", *submitted to COLT 2021*, Feb. 2021. (arXiv: 2102.12948)

P6. Xi Chen, **Yanjun Han**†, and Yining Wang, "Adversarial Combinatorial Bandits with General Non-linear Reward Functions", *submitted to ICML 2021*, Jan. 2021. (arXiv: 2101.01301)

P5. **Yanjun Han**, Ayfer Özgür, and Tsachy Weissman, "Geometric Lower Bounds for Distributed Parameter Estimation under Communication Constraints", *submitted to IEEE Transactions on Information Theory*, Oct. 2020. (arXiv: 1802.08417v3)

P4. **Yanjun Han**, Zhengyuan Zhou, Aaron Flores, Erik Ordentlich, and Tsachy Weissman, "Learning to Bid Optimally and Efficiently in Adversarial First-price Auctions", *submitted to Management Science*, Sept. 2020. (arXiv: 2007.04568)

P3. **Yanjun Han**, Zhengyuan Zhou, and Tsachy Weissman, "Optimal No-regret Learning in Repeated First-price Auctions", *submitted to Operations Research*, May 2020. (arXiv: 2003.09795)

P2. **Yanjun Han**, Zhengqing Zhou, Zhengyuan Zhou, Jose Blanchet, Peter Glynn, and Yinyu Ye, "Sequential Batch Learning in Linear Contextual Bandits", *submitted to Management Science*, Mar. 2020. (arXiv: 2004.06321)

P1. **Yanjun Han**, Kedar Tatwawadi, Zhengqing Zhou, Gowtham Kurri, Vinod Prabhakaran, and Tsachy Weissman, "Optimal Communication Rates and Combinatorial Properties for Distributed Simulation", *submitted to IEEE Transactions on Information Theory*, Apr. 2019. (arXiv: 1904.03271)

JOURNAL
PUBLICATIONS

J15. **Yanjun Han**, Jiantao Jiao, and Tsachy Weissman, "Minimax Rate-Optimal Estimation of Divergences between Discrete Distributions", *Journal on Selected Areas in Information Theory*, vol. 1, no. 3, pp. 814–823, Nov. 2020.

J14. Leighton Barnes, **Yanjun Han**, Ayfer Özgür, "Lower Bounds for Learning Distributions under Communication Constraints via Fisher Information", *Journal of Machine Learning Research*, vol. 21, no. 236, pp. 1–30, 2020.

J13. **Yanjun Han**, Jiantao Jiao, Tsachy Weissman, and Yihong Wu, "Optimal Rates of Entropy Estimation over Lipschitz Balls", *the Annals of Statistics*, vol. 48, no. 6, pp. 3228–3250, Dec. 2020. **(AoS Special Invited Session at JSM 2021)**

J12. **Yanjun Han**, Jiantao Jiao, and Rajarshi Mukherjee, "On Estimation of L_r-Norms in Gaussian White Noise Models", *Probability Theory and Related Fields*, vol. 177, no. 3–4, pp. 1243–1294, 2020.

J11. Jiantao Jiao, and **Yanjun Han**, "Bias Correction Using Jackknife, Bootstrap, and Taylor Series", *IEEE Transactions on Information Theory*, vol. 66, no. 7, pp. 4392–4418, Jul. 2020.

J10. Jiantao Jiao, **Yanjun Han**, Irena Fischer-Hwang, and Tsachy Weissman, "Estimating the Fundamental Limits is Easier than Achieving the Fundamental Limits", *IEEE Transactions on Information Theory*, vol. 65, no. 10, pp. 6704–6715, Oct. 2019.

J9. **Yanjun Han**, Guanyang Wang, "Expectation of the Largest Bet Size in the Labouchere System", *Electronic Communications in Probability*, 24 (2019).

J8. Jiantao Jiao, **Yanjun Han**, and Tsachy Weissman, "Minimax Estimation of the L_1 Distance", *IEEE Transactions on Information Theory*, vol. 64, no. 10, pp. 6672–6706, Oct. 2018.

J7. Jiantao Jiao, **Yanjun Han**, and Tsachy Weissman, "Generalizations of Maximal Inequalities to Arbitrary Selection Rules", *Statistics & Probability Letters*, vol. 137, pp. 19–25, 2018.

J6. Jiantao Jiao, Kartik Venkat, **Yanjun Han**, and Tsachy Weissman, "Maximum Likelihood Estimation of Functionals of Discrete Distributions", *IEEE Transactions on Information Theory*, vol. 63, no. 10, pp. 6774–6798, Oct. 2017.

J5. **Yanjun Han**[†], Or Ordentlich, and Ofer Shayevitz. "Mutual Information Bounds via Adjacency Events," *IEEE Transactions on Information Theory*, Vol. 62, No. 11, pp. 6068–6080, Nov. 2016.

J4. **Yanjun Han**, Yuan Shen, Xiao–Ping Zhang, Moe Z. Win and Huadong Meng. "Performance Limits and Geometric Properties of Narrowband Array Localization", *IEEE Transactions on Information Theory*, Vol. 62, No. 2, pp. 1054–1075, Feb. 2016.

J3. **Yanjun Han**, Jiantao Jiao, and Tsachy Weissman. "Minimax Estimation of Discrete Distributions under ℓ_1 Loss", *IEEE Transactions on Information Theory*, Vol. 61, No. 11, pp. 6343–6354, Nov. 2015.

J2. Jiayi Zhang, Linglong Dai, **Yanjun Han**, Yu Zhang, and Zhaocheng Wang. "On the Ergodic Capacity of MIMO Free-Space Optical Systems over Turbulence Channels", *IEEE Journal on Selected Areas in Communications*, Vol. 33, No. 9, pp. 1925–1934, Sept. 2015.

J1. Jiantao Jiao, Kartik Venkat, **Yanjun Han**, and Tsachy Weissman. "Minimax Estimation of Functionals of Discrete Distributions", *IEEE Transactions on Information Theory*, Vol. 61, No. 5, pp. 2835–2885, May 2015.

C23. **Yanjun Han**, "On the High Accuracy Limitation of Adaptive Property Estimation", *International Conference on Artificial Intelligence and Statistics (AISTATS)*, Apr. 2021.

C22. **Yanjun Han**, Kirankumar Shiragur, "The Optimality of Profile Maximum Likelihood in Estimating Sorted Discrete Distributions", *Symposium on Discrete Algorithms (SODA)*, Jan. 2021.

C21. Zijun Gao, **Yanjun Han**, "Minimax Optimal Nonparametric Estimation of Heterogeneous Treatment Effects", *Conference on Neural Information Processing Systems (NeurIPS)*, Dec. 2020. **(Spotlight, 4% acceptance)**

C20. Jayadev Archaya, Clément Canonne, **Yanjun Han**[†], Ziteng Sun, and Himanshu Tyagi, "Domain Compression and its Application to Randomness-Optimal Distributed Goodness-of-Fit", *Conference on Learning Theory (COLT)*, Jul. 2020.

C19. **Yanjun Han**, "Constrained Functional Value under General Convexity Conditions with Applications to Distributed Simulation", *Proceedings of IEEE International Symposium on Information Theory (ISIT)*, Jun. 2020.

C18. Zijun Gao, **Yanjun Han**[†], Zhimei Ren, and Zhengqing Zhou, "Batched Multi-armed Bandits Problem", *Conference on Neural Information Processing Systems (NeurIPS)*, Vancouver, Canada, Dec. 2019. **(Oral, 0.5% acceptance)**

C17. Leighton Barnes, **Yanjun Han**, Ayfer Ozgur, "Fisher Information for Distributed Estimation under a Blackboard Communication Protocol", *Proceedings of the IEEE International Symposium on Information Theory (ISIT)*, Paris, France, Jul. 2019.

C16. **Yanjun Han**[†], Jiantao Jiao, Chuan-Zheng Lee, Tsachy Weissman, Yihong Wu, and Tiancheng Yu, "Entropy Rate Estimation for Markov Chains with Large State Space", *Conference on Neural Information Processing Systems (NIPS)*, Montréal, Canada, Dec. 2018. **(Spotlight, 4% acceptance)**

C15. Jiantao Jiao, Weihao Gao, and **Yanjun Han**, "The Nearest Neighbor Information Estimator is Adaptively Near Minimax Rate-Optimal", *Conference on Neural Information Processing Systems (NIPS)*, Montréal, Canada, Dec. 2018. **(Spotlight, 4% acceptance)**

C14. **Yanjun Han**, Ayfer Özgür, and Tsachy Weissman, "Geometric Lower Bounds for Distributed Parameter Estimation under Communication Constraints", *Conference on Learning Theory (COLT)*, Stockholm, Sweden, Jul. 2018.

C13. **Yanjun Han**, Jiantao Jiao, and Tsachy Weissman, "Local Moment Matching: a Unified Methodology for Symmetric Functional Estimation and Distribution Estimation under Wasserstein Distance", *Conference on Learning Theory (COLT)*, Stockholm, Sweden, Jul. 2018.

C12. **Yanjun Han**, Pritam Mukherjee, Ayfer Özgür, and Tsachy Weissman, "Distributed Statistical Estimation of High-dimensional and Nonparametric Distributions", *Proceedings of the IEEE International Symposium on Information Theory (ISIT)*, Vail, USA, Jun. 2018.

C11. Jiantao Jiao, **Yanjun Han**, and Tsachy Weissman, "Bounding Exploration Bias for General Measurements", *Proceedings of the IEEE International Symposium on Information Theory (ISIT)*, Aachen, Germany, Jun. 2017.

C10. Jiantao Jiao, Kartik Venkat, **Yanjun Han**, and Tsachy Weissman, "Beyond Maximum Likelihood: from Theory to Practice", *Proceedings of Annual Asilomar Conference on Signals, Systems, and Computers (ASILOMAR)*, Pacific Grove, USA, Nov. 2016.

C9. **Yanjun Han**, Jiantao Jiao, and Tsachy Weissman, "Minimax Rate-optimal Estimation of KL Divergence between Discrete Distributions", *Proceedings of the IEICE International Symposium on Information Theory and Its Applications (ISITA)*, Monterey, USA, Nov. 2016. **(Student Paper Award)**

C8. Jiantao Jiao, **Yanjun Han**, and Tsachy Weissman, "Minimax Estimation of L_1 Distance", *Proceedings of the IEEE International Symposium on Information Theory (ISIT)*, Barcelona, Spain, Jul. 2016. **(Best Student Paper Award Finalist)**

C7. **Yanjun Han**, Jiantao Jiao, and Tsachy Weissman, "Does Dirichlet Prior Smoothing Solve the Shannon Entropy Estimation Problem?", *Proceedings of the IEEE International Symposium on Information Theory (ISIT)*, Hong Kong, China, Jun. 2015.

C6. **Yanjun Han**, Jiantao Jiao, and Tsachy Weissman, "Adaptive Estimation of Shannon Entropy", *Proceedings of the IEEE International Symposium on Information Theory (ISIT)*, Hong Kong, China, Jun. 2015.

C5. **Yanjun Han**, Jiantao Jiao, and Tsachy Weissman. "Minimax Estimation of Discrete Distributions under ℓ_1 Loss", *Proceedings of the IEEE International Symposium on Information Theory (ISIT)*, Hong Kong, China, Jun. 2015.

C4. Jiantao Jiao, Kartik Venkat, **Yanjun Han**, and Tsachy Weissman, "Minimax Estimation of Information Measures", *Proceedings of the IEEE International Symposium on Information Theory (ISIT)*, Hong Kong, China, Jun. 2015.

C3. Jiantao Jiao, Kartik Venkat, **Yanjun Han**, and Tsachy Weissman, "Maximum Likelihood Estimation of Information Measures", *Proceedings of the IEEE International Symposium on Information Theory (ISIT)*, Hong Kong, China, Jun. 2015. **(Semi-plenary talk)**

C2. **Yanjun Han**, Peiyao Zhao, Linzhi Sui, and Zhenkai Fan, "Time-Varying Channel Estimation Based on Dynamic Compressive Sensing for OFDM Systems", *IEEE International Symposium on Broadband Multimedia Systems and Broadcasting (BMSB)*, Beijing, China, Jun. 2014.

C1. **Yanjun Han**, Huadong Meng, Yuan Shen, and Yimin Liu. "Fundamental Localization Accuracy in Narrowband Array-based Systems," *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, Florence, Italy, May 2014. **(Oral)**

INVITED TALKS

T10. Learning to bid in repeated first-price auctions

– Department of Statistics, Harvard University	Feb. 2021
– MIT EECS Special Seminar	Feb. 2021
– Statistics Group, Department of DSO, USC Marshall	Feb. 2021
– Department of IOE, University of Michigan	Feb. 2021
– Stanford Statistics Seminar	Feb. 2021
– Informs Annual Meeting	Nov. 2020
– Econ Reading Group, Stanford Graduate School of Business	Oct. 2020
– Stanford Information Theory Forum	Sept. 2020

- Quant Marketing WIP Seminar, Stanford Graduate School of Business

  Sept. 2020
- Yahoo! Faculty and Research Engagement Program (FREP) Jul. 2020
- Conference on Information Sciences and Systems (CISS), Princeton
  University (canceled due to Covid-19) Mar. 2020

T9. High-accuracy optimality and limitation of the Profile Maximum Likelihood

- Prof. Yury Polyanskiy's group meeting Feb. 2021
- Symposium on Discrete Algorithms (SODA), virtual Jan. 2021
- Stanford Information Theory Forum Sept. 2020

T8. Optimal rates of entropy estimation over Lipschitz balls

- Annals of Statistics Special Invited Session at JSM Aug. 2021
- Department of Electronic Engineering, Tsinghua University Jul. 2018

T7. Optimal communication rates and combinatorial properties for distributed simulation

- Workshop on Local Algorithms (WOLA), virtual Jul. 2020

T6. Domain compression and its application to randomness-optimal distributed goodness-of-fit

- Conference on Learning Theory (COLT), virtual Jul. 2020

T5. Constrained functional value under general convexity conditions with applications to distributed simulation

- International Symposium on Information Theory (ISIT), virtual Jun. 2020

T4. Batched multi-armed bandit problem

- Conference on Information Sciences and Systems (CISS), Princeton
  University (canceled due to Covid-19) Mar. 2020
- Oral presentation at Neural Information Processing Systems (NeurIPS),
  Vancouver, Canada Dec. 2019

T3. Geometric lower bounds for distributed parameter estimation under communication constraints

- Conference on Learning Theory (COLT), Stockholm, Sweden Jul. 2018
- International Symposium on Information Theory (ISIT), Vail, Colorado, USA

  Jun. 2018

T2. Local moment matching: A unified methodology for symmetric functional estimation and distribution estimation under Wasserstein distance

- Conference on Learning Theory (COLT), Stockholm, Sweden Jul. 2018
- Department of Electronic Engineering, Tsinghua University Jul. 2017

T1. Approximation in high-dimensional and nonparametric statistics

- International Symposium on Information Theory and Its Applications (ISITA),
  Monterey, California, USA Oct. 2016
- Department of Electronic Engineering, Tsinghua University Jul. 2016

SELECTED AWARDS & HONORS		
Yahoo! Faculty and Research Engagement Program (FREP) Award	Jul. 2019
ISITA Student Paper Award	Nov. 2016
ISIT Best Student Paper Award Finalist	Jul. 2016
Outstanding Undergraduates in Tsinghua (highest honor)	Jul. 2015
Google Research Award	Feb. 2015
Tsinghua presidential award (highest honor for undergraduates)	Nov. 2014
Gold medal in Chinese Mathematics Olympiad	Jan. 2011
Silver medal in Chinese Physics Olympiad	Nov. 2010

Teaching Experience	Mentor and main editor of online journal for high schoolers Summer 2019, 2020
	Link: https://theinformaticists.com/category/blog/journal-for-high-schoolers/
	Online lecture: information-theoretic lower bounds Summer 2019
	Link: https://theinformaticists.com/category/blog/online-lectures/
	Course Assistant: EE376A - Information Theory Winter 2018, 2019, 2020
	Course Assistant: EE378A - Statistical Signal Processing Spring 2016, 2017
	Course Assistant: EE376C - Universal Schemes in Information Theory Autumn 2016

SOFTWARE

Two-stage nearest-neighbor estimator for heterogeneous treatment effect estimation:
– Github: https://github.com/Mathegineer/NonparametricHTE

BaSE (Batched Successive Elimination) policy for batched bandits:
– Github: https://github.com/Mathegineer/batched-bandit

HJW (Han–Jiao–Weissman) Kullback–Leibler divergence estimator:
– Github: https://github.com/Mathegineer/HJW_KL_divergence_estimator

JVHW (Jiao–Venkat–Han–Weissman) entropy and mutual information estimators:
– Github: https://github.com/EEthinker/JVHW_Entropy_Estimators

JVHW (Jiao–Venkat–Han–Weissman) Rényi entropy estimators:
– Github: https://github.com/EEthinker/JVHW-Renyi-entropy-estimators

PROFESSIONAL ACTIVITIES

Co-organizer:

– 2019 NeurIPS workshop on information theory and machine learning
– Stanford Information Theory Forum

Journal Reviews:

– IEEE Transactions on Information Theory
– The Annals of Statistics
– Bernoulli
– Probability and Statistics Letters
– IEEE Transactions on Wireless Communications
– IEEE Communications Letter

Conference Reviews:

– International Symposium on Information Theory (ISIT): 2016 – 2020
– Conference on Learning Theory (COLT): 2018 – 2021
– Neural Information Processing Systems (NeurIPS): 2018 – 2020
– International Conference on Machine Learning (ICML): 2019 – 2020
– Information Theory Workshop (ITW): 2017 – 2020
– Conference on Artificial Intelligence (AAAI): 2020
– International Conference on Artificial Intelligence and Statistics (AISTATS): 2020 – 2021
– Conference on Uncertainty in Artificial Intelligence (UAI): 2020 – 2021