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<https://yanjunhan2021.github.io>

**RESEARCH INTERESTS**

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

**EDUCATION** **University of California, Berkeley**, Berkeley, CA, USA

Postdoctoral scholar, Simons Institute for the Theory of Computing

- Aug. 2021 - Present

**Stanford University**, Stanford, CA, USA

Ph.D., Electrical Engineering

- Sept. 2015 - Aug. 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** ( $\alpha^\beta$  stands for alphabetical order)

- P6. Nika Haghtalab, **YanJun Han** $^{\alpha^\beta}$ , Abhishek Shetty, and Kunhe Yang, “Oracle-efficient online learning for beyond worst-case adversaries”, Feb. 2022. (arXiv: 2202.08549)
- P5. Brian Axelrod, Shivam Garg, **YanJun Han** $^{\alpha^\beta}$ , Vatsal Sharan, and Gregory Valiant, “On the statistical complexity of sample amplification”, Jan. 2022. (arXiv: 2201.04315)
- P4. Nived Rajaraman, **YanJun Han**, Lin F. Yang, Kannan Ramchandran, and Jiantao Jiao, “Provably Breaking the Quadratic Error Compounding Barrier in Imitation Learning, Optimally”, Feb. 2021. (arXiv: 2102.12948)
- P3. **YanJun Han**, Zhengyuan Zhou, Aaron Flores, Erik Ordentlich, and Tsachy Weissman, “Learning to Bid Optimally and Efficiently in Adversarial First-price Auctions”, Sept. 2020. (arXiv: 2007.04568)
- P2. **YanJun Han**, Zhengqing Zhou, Zhengyuan Zhou, Jose Blanchet, Peter Glynn, and Yinyu Ye, “Sequential Batch Learning in Linear Contextual Bandits”, Apr. 2020. (arXiv: 2004.06321)
- P1. **YanJun Han**, Zhengyuan Zhou, and Tsachy Weissman, “Optimal No-regret Learning in Repeated First-price Auctions”, Mar. 2020. (arXiv: 2003.09795)

- J17. **Yanjun Han**, Kedar Tatwawadi, Zhengqing Zhou, Gowtham Kurri, Vinod Prabhakaran, and Tsachy Weissman, “Optimal Communication Rates and Combinatorial Properties for Common Randomness Generation”, *IEEE Transactions on Information Theory*, vol. 67, no. 12, pp. 7723–7739, Dec. 2021.
- J16. **Yanjun Han**, Ayfer Özgür, and Tsachy Weissman, “Geometric Lower Bounds for Distributed Parameter Estimation under Communication Constraints”, *IEEE Transactions on Information Theory*, vol. 67, no. 12, pp. 8248–8263, Dec. 2021.
- 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** <sup>$\alpha$ - $\beta$</sup> , 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  $\ell_1$  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.
- C27. **Yanjun Han** <sup>$\alpha$ - $\beta$</sup> , Soham Jana, and Yihong Wu, “Optimal Prediction of Markov Chains with and without Spectral Gap”, *Conference on Neural Information Processing Systems (NeurIPS)*, Dec. 2021.
- C26. Nived Rajaraman, **Yanjun Han**, Lin Yang, Jingbo Liu, Jiantao Jiao, Kannan Ramchandran, “On the Value of Interaction and Function Approximation in Imitation Learning”, *Conference on Neural Information Processing Systems (NeurIPS)*, Dec. 2021.
- C25. Wei Zhang, Brendan Kitts, **Yanjun Han**, Zhengyuan Zhou, Tingyu Mao, Hao He, Shengjun Pan, Aaron Flores, San Gultekin, Tsachy Weissman, “MEOW: A Space-Efficient Non-Parametric Bid Shading Algorithm”, *ACM SIGKDD Conference on Knowledge Discovery and Data Mining (KDD)*, Aug. 2021.
- C24. Xi Chen, **Yanjun Han** <sup>$\alpha$ - $\beta$</sup> , and Yining Wang, “Adversarial Combinatorial Bandits with General Non-linear Reward Functions”, *International Conference on Machine Learning (ICML)*, Jul. 2021.
- 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)**
- C20. Jayadev Archaya, Clément Canonne, **Yanjun Han**<sup>†</sup>, 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** <sup>$\alpha$ - $\beta$</sup> , Zhimei Ren, and Zhengqing Zhou, “Batched Multi-armed Bandits Problem”, *Conference on Neural Information Processing Systems (NeurIPS)*, Vancouver, Canada, Dec. 2019. **(Oral)**
- 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** <sup>$\alpha$ - $\beta$</sup> , 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)**
- 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)**
- 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 IEEE 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  $\ell_1$  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
- TOPS Seminar, NYU Stern Nov. 2021
  - 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. The tight statistical analysis of a maximum likelihood estimator based on profiles
- MAD+ Seminar, NYU Courant and Center for Data Science Nov. 2021
  - 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 ( <b>highest honor</b> )	Jul. 2015
	Google Research Award	Feb. 2015
	Tsinghua presidential award ( <b>highest honor for undergraduates</b> )	Nov. 2014
	Gold medal in Chinese Mathematics Olympiad	Jan. 2011
	Silver medal in Chinese Physics Olympiad	Nov. 2010
TEACHING EXPERIENCE	Instructor: EE378C - Information-theoretic Lower Bounds in Data Science	Spring 2021
	Mentor and main editor of online journal for high schoolers	Summer 2019, 2020
	Link: <a href="https://theinformaticists.com/category/blog/journal-for-high-schoolers/">https://theinformaticists.com/category/blog/journal-for-high-schoolers/</a>	
	Online lecture: information-theoretic lower bounds	Summer 2019
	Link: <a href="https://theinformaticists.com/category/blog/online-lectures/">https://theinformaticists.com/category/blog/online-lectures/</a>	
	Course Assistant: EE376A - Information Theory	Winter 2018 - 2021
	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: <a href="https://github.com/Mathengineer/NonparametricHTE">https://github.com/Mathengineer/NonparametricHTE</a>	
	BaSE (Batched Successive Elimination) policy for batched bandits:	
	– Github: <a href="https://github.com/Mathengineer/batched-bandit">https://github.com/Mathengineer/batched-bandit</a>	
	HJW (Han–Jiao–Weissman) Kullback–Leibler divergence estimator:	
	– Github: <a href="https://github.com/Mathengineer/HJW_KL_divergence_estimator">https://github.com/Mathengineer/HJW_KL_divergence_estimator</a>	
	JVHW (Jiao–Venkat–Han–Weissman) entropy and mutual information estimators:	
	– Github: <a href="https://github.com/EEthinker/JVHW_Entropy_Estimators">https://github.com/EEthinker/JVHW_Entropy_Estimators</a>	
	JVHW (Jiao–Venkat–Han–Weissman) Rényi entropy estimators:	
	– Github: <a href="https://github.com/EEthinker/JVHW-Renyi-entropy-estimators">https://github.com/EEthinker/JVHW-Renyi-entropy-estimators</a>	

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
- Journal of the American Statistical Association
- Management Science
- Probability and Statistics Letters
- IEEE Transactions on Wireless Communications
- IEEE Communications Letter

Conference Reviews:

- International Symposium on Information Theory (ISIT): 2016 – 2021
- Conference on Learning Theory (COLT): 2018 – 2021
- Neural Information Processing Systems (NeurIPS): 2018 – 2021
- International Conference on Machine Learning (ICML): 2019 – 2021
- Information Theory Workshop (ITW): 2017 – 2021
- Conference on Artificial Intelligence (AAAI): 2020
- International Conference on Artificial Intelligence and Statistics (AISTATS): 2020 – 2022
- Conference on Uncertainty in Artificial Intelligence (UAI): 2020 – 2021