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Research Interests

Theoretical and algorithmic aspects of high-dimensional statistics, information theory, and optimization.

Education

Ph.D. in Electrical Engineering, Princeton University, Princeton NJ, September 2011

Thesis: Shannon Theory for Compressed Sensing

Minors: Mathematics, Operational Research and Financial Engineering

Advisor: Prof. Sergio Verdú

M.A. in Electrical Engineering, Princeton University, Princeton NJ, September 2008

B.E. in Electrical Engineering (with distinction), Tsinghua University, Beijing, China, July 2006

Honors & Awards

Alfred P. Sloan Research Fellow in Mathematics, 2018

NSF CAREER award, 2017.

Distinguished Program Committee Service Award, Conference on Learning Theory (COLT), 2016.

Simons-Berkeley Research Fellowship, 2015.

List of Teachers Ranked Excellent by Their Students, University of Illinois, Fall 2014.

Strategic Research Initiatives Grant, University of Illinois, 2014.

Marconi Society Paul Baran Young Scholar Award, 2011.

Best student paper award, IEEE International Symposium on Information Theory (ISIT), 2011.

Wallace Memorial honorific fellowship, Princeton University, 2010 - 2011.

Professional Experience

Yale University, New Haven, CT

Professor, Department of Statistics and Data Science, Jul 2022 – present.

Associate professor without term (tenured), Department of Statistics and Data Science, Jul 2021 – Jun 2022.

Associate professor on term, Department of Statistics and Data Science, Jul 2017 – Jun 2021.

Assistant professor, Department of Statistics and Data Science, Jul 2017 – Jun 2019.

Assistant professor, Department of Statistics, Jul 2016 – Jun 2017.

ENSAE ParisTech, Paris, France

Simons Visiting Professor, Center for Research in Economics and Statistics (CREST), Mar 2018.

Simons Institute for the Theory of Computing, University of California, Berkeley, CA

Research fellow, Jan 2015 – May 2015.

University of Illinois at Urbana-Champaign, Urbana, IL

Assistant professor, Department of Electrical and Computer Engineering, Jan 2013 – Jun 2016.

Research assistant professor, Coordinated Science Laboratory, Jan 2013 – Jun 2016.

Affiliated faculty, Department of Statistics, Jul 2014 – Jun 2016.

Statistics Department, The Wharton School, University of Pennsylvania, Philadelphia, PA

Postdoctoral fellow (Host: Prof. Tony T. Cai), Sep 2011 - Dec 2012.

Information and Quantum Systems Lab, HP Labs, Palo Alto, CA

Research associate intern, Jun 2010 - Sep 2010.

Teaching Experience

Instructor

SDS677: Topics in High-Dimensional Statistics and Information Theory, Yale University, Spring 2021

SDS351: Stochastic Processes, Yale University, Spring 2019.

SDS684: Statistical inference on graphs, Yale University, Fall 2018.

SDS241: Probability theory with applications, Yale University, Fall 2016, 2018, 2020, 2021.

STAT364: Information theory, Yale University, Spring 2017, 2022.

ECE598: Information-theoretic methods in high-dimensional statistics, University of Illinois, Spring 2016.

ECE313: Probability with Engineering Applications, University of Illinois, Spring 2014, Fall 2015.

ECE563: Information Theory, University of Illinois, Fall 2013, Fall 2014.

Invited Lecturer

PhD topic course, “Polynomial method in statistical estimation: from large domain to mixture models,” ENSAE ParisTech, Paris, France, Mar 19-29, 2018.

Invited lecturer on “Information-theoretic methods in high-dimensional statistics,” 2015 JTG/IEEE Information Theory Society Summer School on Signal Processing, Communications and Networks, IISc Bangalore, India, July 20-23, 2015.

Research Grants

NSF CCF-1900507; 2019-23 \$218,210; “CIF: Medium: Collaborative Research: Learning in Networks: Performance Limits and Algorithms”, co-PI, with Bruce Hajek and Jiaming Xu.

NSF CCF-1651588; 2017-22 \$571,000; “CAREER: Statistical Inference on Large Domains and Large Networks: Fundamental Limits and Efficient Algorithms”, PI.

NSF CCF-1528159; 2015-18 \$500,000; “CIF: Small: Collaborative Research: Inference of Information Measures on Large Alphabets: Fundamental Limits, Fast Algorithms, and Applications,” co-PI, with Tsachy Weissman. Amount transferred to Yale: \$206,012.

NSF IIS-1447879; 2014-16, \$949,011; “BIGDATA: F: DKA: CSD: DKM: Theory and Algorithms for Processing Data with Sparse and Multilinear Structure,” co-PI, with Yoram Bresler, Marius Junge, Kiryung Lee.

NSF CCF-1423088; 2014-15 \$150,000; “CIF: Small: Collaborative Research: Sketching and Tracking of Covariance Structures for High-dimensional Streaming Data,” co-PI, with Yuejie Chi.

University of Illinois College of Engineering Strategic Research Initiatives; 2014-16 \$150,000; “Big-Data Analytics in Resource-constrained Regime: Statistical Limits and Computational Challenges,” co-PI, with Chandra Chekuri, Bruce Hajek, Sewoong Oh, R. Srikant.

Journal Publications

- [J1] Cheng Mao, Yihong Wu, Jiaming Xu, and Sophie H. Yu, “Testing network correlation efficiently via counting trees,” *preprint*, 2021, arXiv:2110.11816.
- [J2] Yury Polyanskiy and Yihong Wu, “Sharp regret bounds for empirical Bayes and compound decision problems,” *submitted to* The Annals of Statistics, 2021, arXiv preprint arXiv:2109.03943.
- [J3] Jian Ding, Yihong Wu, Jiaming Xu, and Dana Yang, “The planted matching problem: Sharp threshold and infinite-order phase transition,” *submitted to* Probability Theory and Related Fields, 2021, arXiv:2103.09383.
- [J4] Zhou Fan and Yihong Wu, “The replica-symmetric free energy for Ising spin glasses with orthogonally invariant couplings,” *submitted to* Probability Theory and Related Fields, 2021, arXiv:2105.02797.
- [J5] Yihong Wu, Jiaming Xu, and Sophie H. Yu, “Testing correlation of unlabeled random graphs,” *under revision for* The Annals of Applied Probability, Aug 2020, arXiv:2008.10097.
- [J6] Cheng Mao and Yihong Wu, “Learning mixtures of permutations: Groups of pairwise comparisons and combinatorial method of moments,” *to appear in* The Annals of Statistics, 2020, arXiv:2009.06784.
- [J7] Yury Polyanskiy and Yihong Wu, “Self-regularizing property of nonparametric maximum likelihood estimator in mixture models,” *under revision for* The Annals of Statistics, Aug 2020, arXiv:2008.08244.
- [J8] Zhou Fan, Yi Sun, Tianhao Wang, and Yihong Wu, “Likelihood landscape and maximum likelihood estimation for the discrete orbit recovery model,” *to appear in* Communications on Pure and Applied Mathematics, Jul 2020, arXiv:2004.00041.
- [J9] Natalie Doss, Yihong Wu, Pengkun Yang, and Harrison H. Zhou, “Optimal estimation of high-dimensional Gaussian mixtures,” *under revision for* The Annals of Statistics, Feb 2020, arXiv:2002.05818.
- [J10] Jian Ding, Yihong Wu, Jiaming Xu, and Dana Yang, “Consistent recovery threshold of hidden nearest neighbor graphs,” *IEEE Transactions on Information Theory*, vol. 67, no. 8, Aug 2021, arxiv preprint arXiv:1911.08004.
- [J11] Yihong Wu and Harrison H. Zhou, “Randomly initialized EM algorithm for two-component Gaussian mixture achieves near optimality in $O(\sqrt{n})$ iterations,” *to appear in* Mathematical Statistics and Learning, Aug 2019, arxiv preprint arXiv:1908.10935.
- [J12] Zhou Fan, Cheng Mao, Yihong Wu, and Jiaming Xu, “Spectral graph matching and regularized quadratic relaxations I: The Gaussian model,” *submitted to* Foundations of Computational Mathematics, 2019, arxiv preprint arXiv:1907.08880.
- [J13] Zhou Fan, Cheng Mao, Yihong Wu, and Jiaming Xu, “Spectral graph matching and regularized quadratic relaxations II: Erdős-Rényi graphs and universality,” *submitted to* Foundations of Computational Mathematics, 2019, arxiv preprint arXiv:1907.08883.

- [J14] Jian Ding, Zongming Ma, Yihong Wu, and Jiaming Xu, “Efficient random graph matching via degree profiles,” *Probability Theory and Related Fields*, vol. 179, pp. 29–115, 2021, arxiv preprint arxiv:1811.07821.
- [J15] Yury Polyanskiy and Yihong Wu, “Dualizing Le Cam’s method for functional estimation, with applications to estimating the unseens,” *under revision for The Annals of Statistics*, Feb 2019, arxiv preprint arxiv:1804.05436.
- [J16] Anru Zhang, T. Tony Cai, and Yihong Wu, “Heteroskedastic PCA: Algorithm, optimality, and applications,” *to appear in The Annals of Statistics*, Aug 2020, arXiv preprint arXiv:1810.08316.
- [J17] Yury Polyanskiy and Yihong Wu, “Application of information-percolation method to reconstruction problems on graphs,” *Mathematical Statistics and Learning*, vol. 2, no. 1, pp. 1–24, Jun 2020, arxiv preprint arxiv:1804.05436.
- [J18] 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, Nov 2020, arxiv:1711.02141.
- [J19] Vivek Bagaria, Jian Ding, David Tse, Yihong Wu, and Jiaming Xu, “Hidden Hamiltonian cycle recovery via linear programming,” *Operations Research*, vol. 68, no. 1, pp. 53–70, Jan. 2020.
- [J20] Jason M. Klusowski and Yihong Wu, “Estimating the number of connected components in a graph via subgraph sampling,” *Bernoulli*, vol. 26, no. 3, pp. 1635–1664, Feb 2020.
- [J21] Yihong Wu and Pengkun Yang, “Optimal estimation of Gaussian mixtures with denoised method of moments,” *The Annals of Statistics*, vol. 48, no. 4, pp. 1981–2007, 2020.
- [J22] Tony T. Cai and Yihong Wu, “Statistical and computational limits of detecting high-dimensional sparse matrices,” *The Annals of Statistics*, vol. 48, no. 3, pp. 1593–1614, 2020.
- [J23] Yihong Wu and Pengkun Yang, “Chebyshev polynomials, moment matching, and optimal estimation of the unseen,” *The Annals of Statistics*, vol. 47, no. 2, pp. 857–883, 2019.
- [J24] Bruce Hajek, Yihong Wu, and Jiaming Xu, “Submatrix localization via message passing,” *Journal of Machine Learning Research*, vol. 18, no. 186, pp. 1–52, 2018.
- [J25] Yihong Wu and Pengkun Yang, “Sample complexity of the distinct element problem,” *Mathematical Statistics and Learning*, vol. 1, no. 1, pp. 37–72, 2018.
- [J26] F. Calmon, Y. Polyanskiy, and Y. Wu, “Strong data processing inequalities for input-constrained additive noise channels,” *IEEE Transactions on Information Theory*, vol. 64, no. 3, pp. 1879–1892, Mar. 2018, arXiv:1512.06429.
- [J27] Ashok Vardhan Makkuva and Yihong Wu, “Equivalence of additive-combinatorial linear inequalities for shannon entropy and differential entropy,” *IEEE Transactions on Information Theory*, vol. 64, no. 5, pp. 3579–3589, May 2018, arXiv:1601.07498.
- [J28] B. Hajek, Y. Wu, and J. Xu, “Recovering a hidden community beyond the kesten–stigum threshold in $O(|E| \log^* |V|)$ time,” *Journal of Applied Probability*, vol. 55, no. 2, pp. 325–352, Oct 2018.
- [J29] Kiryung Lee, Yihong Wu, and Yoram Bresler, “Near optimal compressed sensing of sparse rank-one matrices via sparse power factorization,” *IEEE Transactions on Information Theory*, vol. 64, no. 3, pp. 1666–1698, Mar. 2018, arXiv:1312.0525.
- [J30] B. Hajek, Y. Wu, and J. Xu, “Information limits for recovering a hidden community,” *IEEE Transactions on Information Theory*, vol. 63, no. 8, pp. 4729–4745, Aug 2017.
- [J31] Alon Orlitsky, Ananda Theertha Suresh, and Yihong Wu, “Optimal prediction of the number of unseen species,” *Proceedings of the National Academy of Sciences (PNAS)*, vol. 113, no. 47, pp. 13 283–13 288, 2016.

- [J32] Yury Polyanskiy and Yihong Wu, “Wasserstein continuity of entropy and outer bounds for interference channels,” *IEEE Transactions on Information Theory*, vol. 62, no. 7, pp. 3992–4002, Jul 2016, arXiv:1504.04419.
- [J33] Bruce Hajek, Yihong Wu, and Jiaming Xu, “Achieving exact cluster recovery threshold via semidefinite programming: Extensions,” *IEEE Transactions on Information Theory*, vol. 62, no. 10, pp. 5918–5937, Oct 2016.
- [J34] Bruce Hajek, Yihong Wu, and Jiaming Xu, “Achieving exact cluster recovery threshold via semidefinite programming,” *IEEE Transactions on Information Theory*, vol. 62, no. 5, pp. 2788–2797, May 2016.
- [J35] Yihong Wu and Pengkun Yang, “Minimax rates of entropy estimation on large alphabets via best polynomial approximation,” *IEEE Transactions on Information Theory*, vol. 62, no. 6, pp. 3702–3720, 2016.
- [J36] Yury Polyanskiy and Yihong Wu, “Dissipation of information in channels with input constraints,” *IEEE Transactions on Information Theory*, vol. 62, no. 1, pp. 35–55, Jan. 2016.
- [J37] Zongming Ma and Yihong Wu, “Volume ratio, sparsity, and minimaxity under unitarily invariant norms,” *IEEE Transactions on Information Theory*, vol. 61, no. 12, pp. 6939 – 6956, Dec 2015.
- [J38] Zongming Ma and Yihong Wu, “Computational barriers in minimax submatrix detection,” *The Annals of Statistics*, vol. 43, no. 3, pp. 1089–1116, 2015.
- [J39] T. Tony Cai, Zongming Ma, and Yihong Wu, “Optimal estimation and rank detection for sparse spiked covariance matrices,” *Probability Theory and Related Fields*, vol. 161, no. 3-4, pp. 781–815, Apr. 2015.
- [J40] Yihong Wu, Shlomo Shamai (Shitz), and Sergio Verdú, “Information Dimension and the Degrees of Freedom of the Interference Channel,” *IEEE Transactions on Information Theory*, vol. 61, no. 1, pp. 256 – 279, Jan 2015.
- [J41] T. Tony Cai and Yihong Wu, “Optimal detection of sparse mixtures against a given null distribution,” *IEEE Transactions on Information Theory*, vol. 60, no. 4, pp. 2217 – 2232, Apr 2014.
- [J42] Kai Yang, Jianwei Huang, Yihong Wu, Xiaodong Wang, and Mung Chiang, “Distributed Robust Optimization (DRO) Part I: Framework and Example,” *Optimization and Engineering*, vol. 15, no. 1, pp. 35–67, 2014.
- [J43] Yury Polyanskiy and Yihong Wu, “Peak-to-average power ratio of good codes for Gaussian channel,” *IEEE Transactions on Information Theory*, vol. 60, no. 12, pp. 7655 – 7660, Sep 2014.
- [J44] T. Tony Cai, Zongming Ma, and Yihong Wu, “Sparse PCA: Optimal rates and adaptive estimation,” *The Annals of Statistics*, vol. 41, no. 6, pp. 3074 – 3110, 2013.
- [J45] Yihong Wu and Sergio Verdú, “Optimal Phase Transitions in Compressed Sensing,” *IEEE Transactions on Information Theory*, vol. 58, no. 10, pp. 6241 – 6263, Oct 2012.
- [J46] Yihong Wu and Sergio Verdú, “Functional properties of MMSE and mutual information,” *IEEE Transactions on Information Theory*, vol. 58, no. 3, pp. 1289 – 1301, Mar 2012.
- [J47] Yihong Wu and Sergio Verdú, “MMSE dimension,” *IEEE Transactions on Information Theory*, vol. 57, no. 8, pp. 4857 – 4879, Aug 2011.
- [J48] Dongning Guo, Yihong Wu, Shlomo Shamai(Shitz), and Sergio Verdú, “Estimation in Gaussian Noise: Properties of the Minimum Mean-square Error,” *IEEE Transactions on Information Theory*, vol. 57, no. 4, pp. 1 – 15, May 2011.
- [J49] Yihong Wu, Dongning Guo, and Sergio Verdú, “Derivative of Mutual Information at Zero SNR: the Gaussian Noise Case,” *IEEE Transactions on Information Theory*, pp. 1–6, Jul 2011.

- [J50] Yihong Wu and Sergio Verdú, “Rényi Information Dimension: Fundamental Limits of Almost Lossless Analog Compression,” *IEEE Transactions on Information Theory*, vol. 56, no. 8, pp. 3721 – 3748, Aug 2010.
- [J51] Yiqun Wu, Lin Zhang, Yihong Wu, and Zhisheng Niu, “Motion Indicated Interest Dissemination with Directional Antennas for Wireless Sensor Networks with Mobile Sinks,” *IEEE Transactions of Vehicular Technology*, vol. 58, no. 2, pp. 977 – 989, Feb 2009.

Books & Monographs

- [B1] Yihong Wu and Pengkun Yang, “Polynomial methods in statistical inference: theory and practice,” *Monograph in Foundations and Trends in Communications and Information Theory*, vol. 17, no. 4, pp. 402–586, Oct 2020.
- [B2] Yihong Wu and Jiaming Xu, “Statistical problems with planted structures: Information-theoretical and computational limits,” in *Information-Theoretic Methods in Data Science*, Yonina Eldar and Miguel Rodrigues, Eds. Cambridge University Press, 2020, arXiv:1806.00118.
- [B3] Yury Polyanskiy and Yihong Wu, “Strong data-processing inequalities for channels and Bayesian networks,” in *Convexity and Concentration. The IMA Volumes in Mathematics and its Applications, vol 161*, Eric Carlen, Mokshay Madiman, and Elisabeth M. Werner, Eds. New York, NY: Springer, 2017, pp. 211–249.
- [B4] Yury Polyanskiy and Yihong Wu, *Information Theory: From Coding to Statistical Learning*. Cambridge University Press, 2022, draft: <http://www.stat.yale.edu/~yw562/teaching/itlectures.pdf>.
- [B5] Yihong Wu, “Lecture notes on information-theoretic methods for high-dimensional statistics,” Aug 2017, <http://www.stat.yale.edu/~yw562/teaching/it-stats.pdf>.
- [B6] Yihong Wu and Jiaming Xu, “Statistical Inference on Graphs: Selected Topics,” Aug 2019, <http://www.stat.yale.edu/~yw562/teaching/stats-graphs.pdf>.

Conference Publications

- [C1] Haoyu Wang, Yihong Wu, Jiaming Xu, and Israel Yolou, “Random graph matching in geometric models: the case of complete graphs,” in *submitted to Conference on Learning Theory (COLT)*, 2022.
- [C2] Yanjun Han, Soham Jana, and Yihong Wu, “Optimal prediction of Markov chains with and without spectral gap,” in *Thirty-fifth Conference on Neural Information Processing Systems (NeurIPS)*, 2021, arXiv preprint arXiv:2106.13947.
- [C3] Yihong Wu, Jiaming Xu, and Sophie H Yu, “Settling the sharp reconstruction thresholds of random graph matching,” in *2021 IEEE International Symposium on Information Theory (ISIT)*, 2021, pp. 2714–2719, arXiv preprint arXiv:2102.00082.
- [C4] Soham Jana, Yury Polyanskiy, and Yihong Wu, “Extrapolating the profile of a finite population,” in *Proceedings of Conference on Learning Theory (COLT)*, Jul 2020, arXiv:2005.10561.
- [C5] Jian Ding, Yihong Wu, Jiaming Xu, and Dana Yang, “Consistent recovery threshold of hidden nearest neighbor graphs,” in *Proceedings of Conference on Learning Theory (COLT)*, Jul 2020.
- [C6] Zhou Fan, Cheng Mao, Yihong Wu, and Jiaming Xu, “Spectral graph matching and regularized quadratic relaxations: Algorithm and theory,” in *International Conference on Machine Learning (ICML)*, Jul 2020.
- [C7] Yanjun Han, Jiantao Jiao, Chuan-Zheng Lee, Tsachy Weissman, Yihong Wu, and Tiancheng Yu, “Entropy rate estimation for Markov chains with large state space,” in *Advances in Neural Information Processing Systems (NIPS)*, 2018, pp. 9802–9813.

- [C8] Yi Hao, Alon Orlitsky, Ananda Theertha Suresh, and Yihong Wu, “Data amplification: A unified and competitive approach to property estimation,” in *Advances in Neural Information Processing Systems (NIPS)*, 2018, pp. 8847–8856.
- [C9] Jason M. Klusowski and Yihong Wu, “Counting motifs with graph sampling,” in *Proceedings of Conference on Learning Theory (COLT)*, Stockholm, Sweden, Jul 2018, arXiv:1802.07773.
- [C10] Yury Polyanskiy, Ananda Theertha Suresh, and Yihong Wu, “Sample complexity of population recovery,” in *Proceedings of Conference on Learning Theory (COLT)*, Amsterdam, Netherland, Jul 2017, arXiv:1702.05574.
- [C11] Maxim Raginsky, Alexander Rakhlin, Matthew Tsao, and Yihong Wu, “Information-theoretic analysis of stability and bias of learning algorithms,” in *Proceedings of 2016 IEEE Information Theory Workshop*, Cambridge, UK, Sep 2016, (invited).
- [C12] Bruce Hajek, Yihong Wu, and Jiaming Xu, “Semidefinite programs for exact recovery of a hidden community,” in *Proceedings of Conference on Learning Theory (COLT)*, New York, NY, Jun 2016, arXiv:1602.06410.
- [C13] B. Hajek, Y. Wu, and J. Xu, “Information limits for recovering a hidden community,” in *2016 IEEE International Symposium on Information Theory*, Barcelona, Spain, Jul 2016.
- [C14] Yury Polyanskiy and Yihong Wu, “Converse bounds via coupling for interference channels and proof of Costa’s conjecture,” in *2016 IEEE International Symposium on Information Theory*, Barcelona, Spain, Jul 2016.
- [C15] Ashok Vardhan Makkuva and Yihong Wu, “On additive-combinatorial affine inequalities for Shannon entropy and differential entropy,” in *2016 IEEE International Symposium on Information Theory*, Barcelona, Spain, Jul 2016.
- [C16] Bruce Hajek, Yihong Wu, and Jiaming Xu, “Achieving exact cluster recovery threshold via semidefinite programming under the stochastic block model,” in *Proceedings of Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, California, Nov 2015, (invited).
- [C17] Yuejie Chi and Yihong Wu, “Change-point estimation of high-dimensional streaming data via sketching,” in *Proceedings of Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, California, Nov 2015.
- [C18] Bruce Hajek, Yihong Wu, and Jiaming Xu, “Exact recovery threshold in the binary censored block model,” in *Proceedings of 2015 IEEE Information Theory Workshop*, Jeju, Korea, Oct 2015, (invited).
- [C19] Bruce Hajek, Yihong Wu, and Jiaming Xu, “Computational lower bounds for community detection on random graphs,” *Conference on Learning Theory (COLT)*, Jul 2015, arxiv:1406.6625.
- [C20] Yihong Wu and Pengkun Yang, “Optimal entropy estimation on large alphabets via best polynomial approximation,” in *Proceedings of 2015 IEEE International Symposium on Information Theory*, Hong Kong, China, Jun 2015, (best student paper award).
- [C21] Bruce Hajek, Yihong Wu, and Jiaming Xu, “Achieving exact cluster recovery threshold via semidefinite programming,” in *Proceedings of 2015 IEEE International Symposium on Information Theory*, Hong Kong, China, Jun 2015, (semi-plenary).
- [C22] F. Calmon, Y. Polyanskiy, and Y. Wu, “Strong data processing inequalities in power-constrained Gaussian channels,” in *Proceedings of 2015 IEEE International Symposium on Information Theory*, Hong Kong, China, Jun 2015.
- [C23] Zongming Ma and Yihong Wu, “Volume ratio, sparsity, and minimaxity under unitarily invariant norms,” in *Proceedings of 2013 IEEE International Symposium on Information Theory*, Istanbul, Turkey, Jul 2013.

- [C24] A. Andoni, H. L. Nguyen, Y. Polyanskiy, and Y. Wu, “Tight lower bound for linear sketches of moments,” in *Proceedings of 40th Internat. Coll. Automata, Languages, and Programming (ICALP-2013)*, Riga, Latvia, Jul 2013.
- [C25] Erik Ordentlich, Marcelo Weinberger, and Yihong Wu, “Piecewise constant prediction,” in *Proceedings of 2012 IEEE International Symposium on Information Theory*, Boston, MA, USA, Jul 2012.
- [C26] Yihong Wu and Sergio Verdú, “Optimal phase transitions in compressed sensing with noisy measurements,” in *Proceedings of 2012 IEEE International Symposium on Information Theory*, Boston, MA, USA, Jul 2012.
- [C27] Yihong Wu, Erik Ordentlich, and Marcelo J. Weinberger, “Energy-driven Lossless Data Compression: Rate-variability Tradeoff,” in *Proceedings of 2011 IEEE International Symposium on Information Theory*, Saint Petersburg, Russia, Aug 2011.
- [C28] Yihong Wu and Sergio Verdú, “Witsenhausen’s Counterexample: a View from Optimal Transport Theory,” in *Proceedings of 50th IEEE Conference on Decision and Control*, Orlando, FL, Dec 2011.
- [C29] Yihong Wu, Shlomo Shamai (Shitz), and Sergio Verdú, “Degrees of Freedom of Interference Channel: a General Formula,” in *Proceedings of 2011 IEEE International Symposium on Information Theory*, Saint Petersburg, Russia, Aug 2011, (best student paper award).
- [C30] Yihong Wu and Sergio Verdú, “The Impact of Constellation Cardinality on Gaussian Channel Capacity,” in *Forty-Eighth Annual Allerton Conference on Communication, Control, and Computing*, Monticello, IL, Sep 2010, (invited).
- [C31] Yihong Wu and Sergio Verdú, “MMSE Dimension,” in *Proceedings of 2010 IEEE International Symposium on Information Theory*, Austin, TX, Jun 2010, (best student paper award finalist).
- [C32] Yihong Wu and Sergio Verdú, “Functional Properties of MMSE,” in *Proceedings of 2010 IEEE International Symposium on Information Theory*, Austin, TX, Jun 2010.
- [C33] Yihong Wu and Sergio Verdú, “Fundamental Limits of Almost Lossless Analog Compression,” in *Proceedings of 2009 IEEE International Symposium on Information Theory*, Seoul, Korea, Jun 2009.
- [C34] Kai Yang, Yihong Wu, Jianwei Huang, Xiaodong Wang, and Sergio Verdú, “Distributed Robust Optimization for Communication Networks,” in *Proceedings of IEEE INFOCOM*, Phoenix, AZ, Apr 2009.
- [C35] Yihong Wu, Xiaobo Chen, Lin Zhang, and Zhisheng Niu, “Interest Dissemination with Directional Antenna for Wireless Sensor Networks with Mobile Sinks,” in *Proceedings of ACM SenSys*, Boulder, CO, Nov 2006.

Preprints & Technical reports

- [P1] Soham Jana, Yury Polyanskiy, and Yihong Wu, “Regret optimality of minimum-distance based empirical Bayes method for the Poisson model,” *Preprint*, 2021.
- [P2] Yury Polyanskiy and Yihong Wu, “Note on approximating the Laplace transform of a Gaussian on a unit disk,” *Preprint*, 2020, arXiv:2008.13372.
- [P3] Yihong Wu, “A simple proof of the Gaussian HWI inequality and extensions,” *preprint*, Dec 2015.
- [P4] Yihong Wu, Erik Ordentlich, and Marcelo J. Weinberger, “Energy-driven Data Compression,” Information and Quantum Systems Lab, HP Labs, Tech. Rep., 2010.

Students and Postdocs

Pengkun Yang, MS and PhD, Department of Electrical and Computer Engineering, University of Illinois, 2018. Current position: Assistant professor, Center for Statistical Science, Tsinghua University, Beijing, China

Ashok Vardhan Makkuva, MS, Department of Electrical and Computer Engineering, University of Illinois, 2016. Current position: PhD student at University of Illinois.

Cheng Mao (PhD in Mathematics, MIT), Postdoc, Department of Statistics and Data Science, Yale University, July 2018–Dec 2019. Current position: Assistant Professor, School of Mathematics, Georgia Tech.

Dana Yang, PhD, Department of Statistics and Data Science, Yale University, 2019 (co-advised with David Pollard and John Lafferty). Current position: Assistant professor, Department of Statistics and Data Science, Cornell University

Natalie Doss, PhD, Department of Statistics and Data Science, Yale University, 2020 (co-advised with Harrison H. Zhou). Current position: Two Sigma Investments.

Soham Jana, PhD, Department of Statistics and Data Science, Yale University, expected 2021.

Yutong Nie, PhD, Department of Statistics and Data Science, Yale University, expected 2025.

Haoyu Wang, PhD, Department of Mathematics, Yale University, expected 2025.

Professional activities

Associate editor, *The Annals of Statistics*, 2020 – Present

Associate editor, *Statistical Science*, 2019 – 2021

Co-guest editor, Special Issue on “Network Analysis and Applications” for *Statistical Science*, 2019

Co-guest editor, Special Issue on “Statistical Inference and Estimation” for *Journal on Selected Areas in Information Theory*, 2020

Co-organizer, Semester-long program on “Computational Complexity of Statistical Inference”, Simons Institute for the Theory of Computing, Berkeley, CA, Fall 2021

Co-organizer of CMO Workshop on “Learning in Networks: Performance Limits and Algorithms”, Banff International Research Station, Oaxaca, Mexico, Nov 2022

Co-organizer of Sublinear Algorithms Workshop, MIT, Cambridge, MA, Jun 2018

Program Committee member/Area chair

ISIT 2015, 2016, 2019, 2021; COLT 2016-2018, 2020-2022.

Referees:

Journals: *The Annals of Statistics*, *Applied and Computational Harmonic Analysis*, *Automatica*, *Bernoulli*, *Communications in Mathematical Physics*, *Communications on Pure and Applied Mathematics*, *Entropy*, *Electronic Journal of Statistics*, *IEEE Transactions on Information Theory*, *IEEE Transactions on Signal Processing*, *IEEE Transactions on Wireless Communications*, *Journal of Statistical Mechanics: Theory and Experiments*, *Latin American Journal of Probability and Mathematical Statistics (ALEA)*, *Mathematical Statistics and Learning*, *Probability Theory and Related Fields*, *Proceedings of the IEEE*, *SIAM Journal on Imaging Sciences*, *Theory of Computing*.

Conferences: Conference on Learning Theory (COLT), IEEE Symposium on Foundations of Computer Science (FOCS), IEEE International Symposium on Information Theory (ISIT), IEEE Information Theory Workshop (ITW), IEEE Annual Conference on Decision and Control (CDC), Annual Conference on Neural Information Processing Systems (NeurIPS), International Workshop on Randomization and Computation (RANDOM), ACM-SIAM Symposium on Discrete Algorithms (SODA),

ACM Symposium on Theory of Computing (STOC).