

CONTACT	211 Blockley Hall 423 Guardian Drive Philadelphia, PA 19104	caichangxiao@gmail.com https://cxcai.github.io
EDUCATION	<p>Ph.D. in Electrical Engineering, Princeton University, Princeton, NJ, USA May 2021 Advisors: Prof. Yuxin Chen and Prof. H. Vincent Poor</p> <p>M.A. in Electrical Engineering, Princeton University, Princeton, NJ, USA May 2018 Advisor: Prof. Sergio Verdú</p> <p>B.E. in Electronic Engineering (with distinction), Tsinghua University, Beijing, China June 2016</p> <p>B.S. in Economics (second degree), Tsinghua University, Beijing, China June 2016</p>	
EMPLOYMENT	<p>University of Pennsylvania, Philadelphia, PA, USA Postdoctoral researcher July 2021 - present Advisors: Prof. T. Tony Cai and Prof. Hongzhe Li</p>	
RESEARCH INTERESTS	Mathematical data science, high-dimensional statistics, reinforcement learning, convex and nonconvex optimization, information theory	
PREPRINTS	<ol style="list-style-type: none"> 1. Changxiao Cai, T. Tony Cai, Hongzhe Li, “Transfer Learning for Contextual Multi-armed Bandits”, submitted to <i>The Annals of Statistics</i>, 2022, arXiv:2211.12612 2. Gen Li, Changxiao Cai, H. Vincent Poor, Yuxin Chen, “Minimax Estimation of Linear Functions of Eigenvectors in the Face of Small Eigen-Gaps”, submitted to <i>The Annals of Applied Probability</i>, 2022, arXiv:2104.03298 3. Gen Li, Changxiao Cai, Yuxin Chen, Yuting Wei, Yuejie Chi, “Is Q-Learning Minimax Optimal? A Tight Sample Complexity Analysis”, major revision for <i>Operations Research</i>, 2022, arXiv:2102.06548 	
JOURNALS	<ol style="list-style-type: none"> 1. Changxiao Cai, H. Vincent Poor, Yuxin Chen, “Uncertainty Quantification for Non-convex Tensor Completion: Confidence Intervals, Heteroscedasticity and Optimality”, accepted to <i>IEEE Transactions on Information Theory</i>, 2022+, arXiv:2006.08580 2. Changxiao Cai, Gen Li, Yuejie Chi, H. Vincent Poor, Yuxin Chen, “Subspace Estimation from Unbalanced and Incomplete Data Matrices: $\ell_{2,\infty}$ Statistical Guarantees”, <i>The Annals of Statistics</i>, 49(2): 944–967, 2021. 3. Changxiao Cai, Gen Li, H. Vincent Poor, Yuxin Chen, “Nonconvex Low-Rank Tensor Completion from Noisy Data”, <i>Operations Research</i>, 70(2): 1219–1237, 2022. 4. Changxiao Cai, Sergio Verdú, “Conditional Rényi Divergence Saddlepoint and the Maximization of α-Mutual Information”, <i>Entropy, Special Issue on Probabilistic Methods in Information Theory, Hypothesis Testing, and Coding</i>, vol. 21, issue 10, Oct. 2019. 5. Changxiao Cai, Sujay Sanghavi, Haris Vikalo, “Structured Low-Rank Matrix Factorization for Haplotype Assembly”, <i>IEEE Journal of Selected Topics in Signal Processing, Special Issue on Structured Matrices in Signal and Data Processing</i>, vol. 10, no. 4, pp. 647–657, June 2016. 	

CONFERENCES	<ol style="list-style-type: none"> 1. Gen Li, Changxiao Cai, Yuxin Chen, Yuantao Gu, Yuting Wei, Yuejie Chi, “Tightening the Dependence on Horizon in the Sample Complexity of Q-Learning”, <i>International Conference on Machine Learning (ICML)</i>, July, 2021. 2. Changxiao Cai, H. Vincent Poor, Yuxin Chen, “Uncertainty Quantification for Non-convex Tensor Completion: Confidence Intervals, Heteroscedasticity and Optimality”, <i>International Conference on Machine Learning (ICML)</i>, July, 2020. 3. Changxiao Cai, Gen Li, H. Vincent Poor, Yuxin Chen, “Nonconvex Low-Rank Tensor Completion from Noisy Data”, <i>Conference on Neural Information Processing Systems (NeurIPS)</i>, pp. 1863–1874, Vancouver, Canada, Dec. 2019. 4. Changxiao Cai, Sujay Sanghavi, Haris Vikalo, “Structurally-constrained Gradient Descent for Matrix Factorization in Haplotype Assembly Problems”, <i>IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)</i>, pp.2638–2641, Shanghai, China, Mar. 2016. 												
WORKING PAPERS	<ol style="list-style-type: none"> 1. Changxiao Cai, T. Tony Cai, Hongzhe Li, “Transfer Learning for Clustering in Gaussian Mixture Models”, in preparation. 2. Hongzhe Zhang, Changxiao Cai, T. Tony Cai, Hongzhe Li, “Transfer Learning for Ridge Regression with Random Coefficients”, in preparation. 												
HONORS AND AWARDS	<table> <tr> <td>SEAS Award for Excellence, Princeton University</td><td>2020</td></tr> <tr> <td>Gordon Y.S. Wu Fellowship in Engineering, Princeton University</td><td>2016 - 2021</td></tr> <tr> <td>Outstanding Undergraduate in Beijing, Tsinghua University</td><td>2016</td></tr> <tr> <td>China National Scholarship (2%), Tsinghua University</td><td>2013 & 2014</td></tr> <tr> <td>ST Engineering China Scholarship (1%), Tsinghua University</td><td>2013 - 2015</td></tr> <tr> <td>Outstanding Academic Performance Scholarship, Tsinghua University</td><td>2013 - 2016</td></tr> </table>	SEAS Award for Excellence, Princeton University	2020	Gordon Y.S. Wu Fellowship in Engineering, Princeton University	2016 - 2021	Outstanding Undergraduate in Beijing, Tsinghua University	2016	China National Scholarship (2%), Tsinghua University	2013 & 2014	ST Engineering China Scholarship (1%), Tsinghua University	2013 - 2015	Outstanding Academic Performance Scholarship, Tsinghua University	2013 - 2016
SEAS Award for Excellence, Princeton University	2020												
Gordon Y.S. Wu Fellowship in Engineering, Princeton University	2016 - 2021												
Outstanding Undergraduate in Beijing, Tsinghua University	2016												
China National Scholarship (2%), Tsinghua University	2013 & 2014												
ST Engineering China Scholarship (1%), Tsinghua University	2013 - 2015												
Outstanding Academic Performance Scholarship, Tsinghua University	2013 - 2016												
TEACHING	<p>ELE538: Mathematics of High-Dimensional Data, Fall 2018, Teaching Assistant</p> <p>ELE520: Mathematics of Data Science, Fall 2020, Teaching Assistant</p>												
TALKS	<p>“Uncertainty Quantification for Nonconvex Tensor Completion: Confidence Intervals, Heteroscedasticity and Optimality”, <i>The Machine Learning/Artificial Intelligence Seminar</i>, EE, Princeton University, 2020</p> <p>“Nonconvex Low-rank Tensor Completion from Noisy Data”, <i>Virtual Workshop on Missing Data Challenges in Computation, Statistics and Applications</i>, IAS, 2020</p> <p>“Uncertainty Quantification for Nonconvex Tensor Completion: Confidence Intervals, Heteroscedasticity and Optimality”, <i>International Conference on Machine Learning (ICML)</i>, 2020</p>												
PROFESSIONAL SERVICE	<p>Reviewer for journals: The Annals of Statistics, IEEE Transactions on Information Theory, Operations Research, SIAM Journal on Matrix Analysis and Applications, IEEE Transactions on Signal Processing, Information and Inference: A Journal of the IMA, IEEE Communications Letters, Entropy</p> <p>Reviewer for conferences: Conference on Neural Information Processing Systems (NeurIPS), International Conference on Machine Learning (ICML), IEEE International Symposium on Information Theory (ISIT), International Conference on Learning Representations (ICLR), Conference on Information Sciences and Systems (CISS)</p>												

Member of Technical Program Committee: 52nd Annual Conference on Information Sciences and Systems (CISS 2018), 54th Annual Conference on Information Sciences and Systems (CISS 2020)