Li, Gen

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Education

2022.1-now	University of Pennsylvania.	**Postdoc**
	Statistics and Data Science, Wharton School	Advisor: Yuxin Chen and Yuting Wei
2021.9-2021.12	Princeton University.	**Postdoc**
	Electrical and Computer Engineering	Advisor: Yuxin Chen
2016.8-2021.7	Tsinghua University.	**Ph.D. (Hons.)**
	Electronic Engineering	Advisor: Yuantao Gu
2012.8-2016.7	Electronic Engineering, Tsinghua University.	**Bachelor**
2013.8-2016.7	Mathematics, Tsinghua University.	**Bachelor**

Research interest

Reinforcement learning, high-dimensional statistics, mathematical optimization, machine learning

Journal Articles

J1. G. Li, Y. Wei, Y. Chi, Y. Gu, and Y. Chen, "Sample Complexity of Asynchronous Q-Learning: Sharper Analysis and Variance Reduction," IEEE Transactions on Information Theory 68 (1), 448-473, January 2022.

J2. G. Li, L. Shi, Y. Chen, Y. Chi, Y. Wei, "Settling the sample complexity of model-based offline reinforcement learning," arXiv preprint arXiv:2204.05275, 2022.

J3. C. Cai, G. Li, H. V. Poor, and Y. Chen, "Nonconvex Low-Rank Tensor Completion from Noisy Data," Operations Research, vol. 70, no. 2, pp. 1219–1237, 2022.

J4. Y. Yan, G. Li, Y. Chen, J. Fan, "Model-Based Reinforcement Learning Is Minimax-Optimal for Offline Zero-Sum Markov Games," arXiv preprint arXiv:2206.04044, 2022.

J5. Y. Yan, G. Li, Y. Chen, J. Fan, "The Efficacy of Pessimism in Asynchronous Q-Learning," arXiv preprint arXiv:2203.07368, 2022.

J6. G. Li, L. Shi, Y. Chen, Y. Gu, and Y. Chi, "Breaking the Sample Complexity Barrier to Regret-Optimal Model-Free Reinforcement Learning," arXiv preprint arXiv:2110.04645, 2021.

J7. G. Li, C Cai, Y. Chen, Y. Gu, Y. Wei, and Y. Chi, "Is Q-Learning Minimax Optimal? A Tight Sample Complexity Analysis," arXiv preprint arXiv:2102.06548, 2021.

J8. G. Li, Y. Wei, Y. Chi, Y. Gu, and Y. Chen, "Softmax Policy Gradient Methods Can Take Exponential Time to Converge," arXiv preprint arXiv:2102.11270, 2021.

J9. C. Cai, G. Li, Y. Chi, H. V. Poor, and Y. Chen, "Subspace Estimation from Unbalanced and Incomplete Data Matrices: $\ell_{2,\infty}$ Statistical Guarantees," Annals of Statistics 49 (2), 944-967, April 2021.

J10. G. Li, Y. Gu, and J. Ding, "ℓ_1 Regularization in Two-Layer Neural Networks," IEEE Signal Processing Letters, 2021.

J11. G. Li, Y. Wei, Y. Chi, Y. Gu, and Y. Chen, "Breaking the Sample Size Barrier in Model-Based Reinforcement Learning with a Generative Model," arXiv preprint arXiv:2005.12900, 2020.

J12. G. Li, Q. Liu, and Y. Gu, "Rigorous Restricted Isometry Property for Low-Dimensional Subspaces," Applied and Computational Harmonic Analysis, 49(2):608-635, September 2020.

J13. Y. M. Lu, and G. Li, "Phase transitions of spectral initialization for high-dimensional non-convex estimation," Information and Inference: A Journal of the IMA 9(3), 507-541, September 2020.

J14. G. Li, X. Xu, and Y. Gu, "Lower Bound for RIP Constants and Concentration of Sum of Top Order Statistics," IEEE Transactions on Signal Processing, 68:3169-3178, April 2020.

J15. X. Xu, G. Li, and Y. Gu, "Unraveling the Veil of Subspace RIP Through Near-Isometry on Subspaces," IEEE Transactions on Signal Processing, 68:3117-3131, April 2020.

J16. G. Li and Y. Gu, "Restricted Isometry Property of Gaussian Random Projection for Finite Set of Subspaces," IEEE Transactions on Signal Processing, 66(7):1705-1720, April 2018.

J17. L. Meng, G. Li, J. Yan, and Y. Gu, "A General Framework for Understanding Compressed Subspace Clustering Algorithms," IEEE Journal of Selected Topics in Signal Processing, 12(6):1504-1519, December 2018.

J18. J. Wang, G. Li, L. Rencker, W. Wang, and Y. Gu, "An RIP-Based Performance Guarantee of Covariance-Assisted Matching," IEEE Signal Processing Letters, 25(6), 828-832, March 2018.

J19. Y. Chen, G. Li, and Y. Gu, "Active Orthogonal Matching Pursuit for Sparse Subspace Clustering," IEEE Signal Processing Letters, 25(2):164 - 168, February 2018.

Conference papers

C1. L. Shi, G. Li, Y. Wei, Y. Chen, Y. Chi, "Pessimistic Q-Learning for Offline Reinforcement Learning: Towards Optimal Sample Complexity," International Conference on Machine Learning (ICML), July 2022.

C2. G. Li, L. Shi, Y. Chen, Y. Gu, and Y. Chi, "Breaking the Sample Complexity Barrier to Regret-Optimal Model-Free Reinforcement Learning," Neural Information Processing Systems (NeurIPS) (Spotlight), December 2021.

C3. G. Li, Y. Chen, Y. Chi, Y. Gu, and Y. Wei, "Sample-Efficient Reinforcement Learning Is Feasible for Linearly Realizable MDPs with Limited Revisiting," Neural Information Processing Systems (NeurIPS), December 2021.

C4. G. Li and Y. Gu, "Theory of Spectral Method for Union of Subspaces-Based Random Geometry Graph," International Conference on Machine Learning (ICML), July 2021.

C5. G. Li, C Cai, Y. Chen, Y. Gu, Y. Wei, and Y. Chi, "Tightening the Dependence on Horizon in the Sample Complexity of Q-Learning," International Conference on Machine Learning (ICML), July 2021.

C6. G. Li, Y. Wei, Y. Chi, Y. Gu, and Y. Chen, "Softmax Policy Gradient Methods Can Take Exponential Time to Converge," Conference on Learning Theory (COLT), August 2021.

C7. G. Li, Y. Wei, Y. Chi, Y. Gu, and Y. Chen, "Breaking the Sample Size Barrier in Model-Based Reinforcement Learning with a Generative Model," Neural Information Processing Systems (NeurIPS), December 2020

C8. G. Li, Y. Wei, Y. Chi, Y. Gu, and Y. Chen, "Sample Complexity of Asynchronous Q-Learning: Sharper Analysis and Variance Reduction," Neural Information Processing Systems (NeurIPS), December 2020

C9. C. Cai, G. Li, Y. Chi, H. V. Poor, and Y. Chen, "Nonconvex Low-Rank Symmetric Tensor Completion from Noisy Data," Neural Information Processing Systems (NeurIPS), Vancouver, Canada, December 2019.

C10. G. Li, J. Yan, and Y. Gu, Information Theoretic Lower Bound of Restricted Isometry Property Constant, IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), Brighton, UK, May, 2019.

C11. G. Li, J. Yan, and Y. Gu, "Outage Probability Conjecture Does Not Hold for Two-Input-Multiple-Output (TIMO) System," IEEE International Symposium on Information Theory (ISIT), Vail, CO, USA, June 2018.

C12. G. Li, Y. Jiao, and Y. Gu, "Convergence Analysis on A Fast Iterative Phase Retrieval Algorithm without Independence Assumption," IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), Calgary, Canada, April 2018.

C13. Y. Jiao, G. Li, and Y, Gu, "Principal Angles Preserving Property of Gaussian Random Projection for Subspaces," IEEE Global Conference on Signal and Information Processing (GlobalSIP), Montreal, Canada, November 2017.

C14. G. Li and Y. Gu, "Distance-preserving property of random projection for subspaces," IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), New Orleans, USA, March 2017.

C15. G. Li, Y. Gu, and Y. M. Lu, "Phase Retrieval Using Iterative Projections: Dynamics in the Large Systems Limit," IEEE Allerton Conference on Communications, Control, and Computing, September 2015.

Honors

2020	Excellent graduate award.	Tsinghua University (4 in EE department)
2020	Excellent thesis award.	Tsinghua University (6 in EE department)