Allen X. Liu

Personal Information
Email: cliu568@mit.edu
Date of Birth: June 12, 1999
Citizenship: USA

Education
Massachusetts Institute of Technology
  Candidate for Ph.D in Computer Science (expected graduation 2025)

Massachusetts Institute of Technology
  S.M. in Computer Science, 2022

Massachusetts Institute of Technology
  B. Sc. in Mathematics, 2020

Awards and Honors
Citadel GQS PhD Fellowship (awarded 2024)
Hertz Fellowship (awarded 2021)
NSF Graduate Research Fellowship (awarded 2020)
William Lowell Putnam Mathematical Competition: N1 (2016,17,19), N2 (2018)
International Mathematical Olympiad (IMO): Gold medalist (2014-2016), Perfect score (2016)
USA Mathematical Olympiad (USAMO): National winner (2014-2016), Perfect score (2015,16)

Working Experience
Research Intern, Microsoft Research, WA, Summer 2021, 2022
Hosted by Jerry Li

Research Intern, Google Research, MA, Summer 2020
Hosted by Morteza Zadimoghaddam

Research Intern, Google Research, NY, Summer 2019
Hosted by Jon Schneider and Renato Paes Leme

Quantitative Research Intern, D. E. Shaw & Co., NY, Summer 2018

Trading Intern, Jane Street Capital, NY, Summer 2017

Research
Research Areas: Theoretical Computer Science, Machine Learning, Quantum Information
Selected Publications
*author order is generally alphabetical denoting equal contribution

High-Temperature Gibbs States are Unentangled and Efficiently Preparable
A. Bakshi, A. Liu, A. Moitra, E. Tang
IEEE Symposium on Foundations of Computer Science (FOCS 2024)

Structure Learning of Hamiltonians from Real-Time Evolution
A. Bakshi, A. Liu, A. Moitra, E. Tang
IEEE Symposium on Foundations of Computer Science (FOCS 2024)

Learning Quantum Hamiltonians at Any Temperature in Polynomial Time
A. Bakshi, A. Liu, A. Moitra, E. Tang
*Quantum Information Processing (QIP 2024 **Invited Plenary, Best Student Paper**)*
*ACM Symposium on Theory of Computing (STOC 2024, **Invited to SICOMP Special Issue**)*

Constant Approximation for Individual Preference Stable Clustering
A. Aamand, J. Chen, A. Liu, S. Silwal, P. Sukprasert, A. Vakilian, F. Zhang
*Advances in Neural Information Processing Systems (NeurIPS 2023, **Spotlight**)*

When Does Adaptivity Help for Quantum State Learning?
S. Chen, B. Huang, J. Li, A. Liu, M. Sellke
Quantum Information Processing (QIP 2023)
IEEE Symposium on Foundations of Computer Science (FOCS 2023)

The Full Landscape of Robust Mean Testing: Sharp Separations between Oblivious and Adaptive Contamination
C. Canonne, S. Hopkins, J. Li, A. Liu, S. Narayanan
*IEEE Symposium on Foundations of Computer Science (FOCS 2023, **Invited to SICOMP Special Issue**)*

Matrix Completion in Almost-Verification Time
J. Kelner, J. Li, A. Liu, A. Sidford, K. Tian
IEEE Symposium on Foundations of Computer Science (FOCS 2023)

Semi-Random Sparse Recovery in Nearly-Linear Time
J. Kelner, J. Li, A. Liu, A. Sidford, K. Tian
Conference on Learning Theory (COLT 2023)

Learning Mixtures of Linear Dynamical Systems
A. Bakshi, A. Liu, A. Moitra, M. Yau
International Conference on Machine Learning (ICML 2023)

A New Approach to Learning Linear Dynamical Systems
A. Bakshi, A. Liu, A. Moitra, M. Yau
ACM Symposium on Theory of Computing (STOC 2023)

Robust Voting Rules from Algorithmic Robust Statistics
A. Liu, A. Moitra
ACM-SIAM Symposium on Discrete Algorithms (SODA 2023)

Minimax Rates for Robust Community Detection
A. Liu, A. Moitra
IEEE Symposium on Foundations of Computer Science (FOCS 2022)

Tight Bounds for Quantum State Certification with Incoherent Measurements
S. Chen, B. Huang, J. Li, A. Liu
Quantum Information Processing (QIP 2023)
IEEE Symposium on Foundations of Computer Science (FOCS 2022)

Robust Model Selection and Nearly-Proper Learning for GMMs
J. Li, A. Liu, A. Moitra
Advances in Neural Information Processing Systems (NeurIPS 2022)

Clustering Mixtures with Almost Optimal Separation in Polynomial Time
J. Li, A. Liu
*ACM Symposium on Theory of Computing (STOC 2022, **SICOMP Special Issue**)*

Settling the Robust Learnability of Mixtures of Gaussians
A. Liu, A. Moitra
*ACM Symposium on Theory of Computing (STOC 2021, **Journal of the ACM 2023**)*

Variable Decomposition for Prophet Inequalities and Optimal Ordering
A. Liu, R. Paes Leme, M. Pal, J. Schneider, B. Sivan
ACM Conference on Economics and Computation (EC 2021)

Optimal Contextual Pricing and Extensions
A. Liu, R. Paes Leme, J. Schneider
Annual ACM-SIAM Symposium on Discrete Algorithms (SODA 2021)

Tensor Completion Made Practical
A. Liu, A. Moitra
Advances in Neural Information Processing Systems (NeurIPS 2020)

Fourier and Circulant Matrices are not Rigid
Z. Dvir, A. Liu
Computational Complexity Conference (CCC 2019)

Efficiently Learning Mixtures of Mallows Models
A. Liu, A. Moitra
IEEE Symposium on Foundations of Computer Science (FOCS 2018)

Teaching
Teaching Assistant for 6.S896 (Algorithmic Statistics) at MIT, Fall 2023
Teaching Assistant at USA Math Olympiad Summer Program, Summer 2017, 2018

References
Available upon request