Allen X. Liu

Personal Information

Email: cliu568@mit.edu
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Citizenship: USA

Education

Massachusetts Institute of Technology *2020-present*
   Candidate for Ph.D in Computer Science
Massachusetts Institute of Technology *2016-2020*
   B. Sc. in Mathematics
Department of Mathematics, University of Rochester *2011-2015*
   Concurrent enrollment during high school

Awards and Honors

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 Scorer (2016)
USA Mathematical Olympiad (USAMO): National winner (2014-2016), Perfect Scorer (2015,16)

Research

Research Interests

Combinatorics, Theoretical Computer Science, Machine Learning

Selected Publications

Settling the Robust Learnability of Mixtures of Gaussians

A. Liu, A. Moitra

Manuscript

Variable Decomposition for Prophet Inequalities and Optimal Ordering

A. Liu, R. Paes Leme, M. Pal, J. Schneider, B. Sivan

Manuscript

Optimal Contextual Pricing and Extensions

A. Liu, R. Paes Leme, J. Schneider

Proceedings of the 30th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA 2021)

Tensor Completion Made Practical

A. Liu, A. Moitra

Advances in Neural Information Processing Systems 33 (NeurIPS 2020)

Myersonian Regression

A. Liu, R. Paes Leme, J. Schneider

Advances in Neural Information Processing Systems 33 (NeurIPS 2020)

Better Algorithms for Estimating Non-Parametric Models in Crowd-Sourcing and Rank Aggregation

A. Liu, A. Moitra

Proceedings of the 33rd Annual Conference on Learning Theory (COLT 2020)

Fourier and Circulant Matrices are not Rigid

Z. Dvir, A. Liu

34th Computational Complexity Conference (CCC 2019)

Efficiently Learning Mixtures of Mallows Models

A. Liu, A. Moitra

Proceedings of the 59th Annual IEEE Symposium on Foundations of Computer Science (FOCS 2018)

Wavelet decomposition and bandwidth of functions defined on vector spaces over finite fields

Working Experience

Google Research, MA *2020*
Worked on proving theoretical guarantees for distributed load balancing algorithms and correlation clustering

Google Research, NY *2019*
Worked on theoretical research in online learning related to bandits, contextual search, and prophet inequalities

D. E. Shaw & Co., NY *2018*
Quantitative research intern, worked on generating synthetic orderbook data using recurrent neural networks

Jane Street Capital, NY *2017*
Trading intern, analyzed real market data and built models to develop trading strategies for options and commodity futures

MIT Computer Science and Artificial Intelligence Laboratory, MA *2017-2020*
Researching and developing algorithms with provable guarantees for learning and modeling ranking data

Volunteer and Teaching

Problem Czar for Harvard MIT Math Tournament 2016-2018
Wrote problems and assembled tests for the tournament.

Teaching Assistant and Grader at USA Math Olympiad Summer Program 2017-2018
Training program for the USA team for the International Math Olympiad (IMO). Gave lectures to students on a variety of topics and helped coordinate logistics and grading.

References

Available upon request