

# Sitan Chen

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## CONTACT INFORMATION

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## RESEARCH INTERESTS

theoretical computer science, machine learning

## EDUCATION

### Massachusetts Institute of Technology

Ph.D. in Computer Science, June 2021 expected  
Advisor: Ankur Moitra

### Harvard University

A.M. in Mathematics, May 2016  
A.B. in Mathematics and Computer Science *Summa Cum Laude*, May 2016  
Thesis: *Geometry in Algorithms and Complexity*  
Advisor: Profs. Joseph Harris, J.M. Landsberg, and Leslie Valiant  
Received the Thomas T. Hoopes Prize and Captain Jonathan Fay Prize (best thesis)

## HONORS AND AWARDS

Paul and Daisy Soros Fellowship  
MIT Presidential Fellowship  
New World Mathematics Award, Gold Prize  
Captain Jonathan Fay Prize  
Wister Prize (Harvard mathematics undergraduate with highest record)  
Thomas T. Hoopes Prize  
Derek Bok Center Certificate of Distinction in Teaching  
Phi Beta Kappa  
CRA Outstanding Undergraduate Researcher- Finalist  
John Harvard Scholar  
Davidson Fellowship  
Intel Science Talent Search Finalist  
Siemens Competition National Individ. Finalist (\$40K winner)  
Siemens Competition National Team Finalist (\$30K winner)  
Research Science Institute Scholar, Top Oral Award

## ACADEMIC EXPERIENCE

*Research Intern*, Microsoft Research Redmond, Summer 2019  
Hosted by Jerry Li  
*Visiting Graduate Student*, UC Berkeley, Summer 2018  
Hosted by Prasad Raghavendra

## PUBLICATIONS

S. Chen, Z. Song, D. Zhuo. On InstaHide, Phase Retrieval, and Sparse Matrix Factorization. *International Conference on Learning Representations (ICLR 2021)*.

S. Chen, F. Koehler, A. Moitra, M. Yau. Classification Under Misspecification: Halfspaces, Generalized Linear Models, and Connections to Evolvability. *Advances in Neural Information Processing Systems (NeurIPS 2020, spotlight)*.

S. Chen, J. Li, A. Moitra. Learning Structured Distributions from Untrusted Batches: Faster and Simpler. *Advances in Neural Information Processing Systems (NeurIPS 2020)*.

S. Bubeck, S. Chen, J. Li. Entanglement is Necessary for Optimal Quantum Property Testing. *Proceedings of the 61st Annual IEEE Symposium on Foundations of Computer Science (FOCS 2020)*.

S. Chen, R. Meka. Learning Polynomials of Few Relevant Dimensions. *Proceedings of the 33rd Annual Conference on Learning Theory (COLT 2020)*.

S. Chen, J. Li, Z. Song. Learning Mixtures of Linear Regressions in Subexponential Time via Fourier Moments. *Proceedings of the 52nd Annual ACM Symposium on Theory of Computing (STOC 2020)*.

S. Chen, J. Li, A. Moitra. Efficiently Learning Structured Distributions from Untrusted Batches. *Proceedings of the 52nd Annual ACM Symposium on Theory of Computing (STOC 2020)*.

S. Chen, A. Moitra. Beyond the Low-Degree Algorithm: Mixtures of Subcubes and Their Applications. *Proceedings of the 51st Annual ACM Symposium on Theory of Computing (STOC 2019)*.

S. Chen, M. Delcourt, A. Moitra, G. Perarnau, L. Postle. Improved Bounds for Randomly Sampling Colorings via Linear Programming. *Proceedings of the 29th Annual ACM-SIAM Symposium on Discrete Algorithms (SODA 2019)*.

S. Chen. Basis Collapse for Holographic Algorithms over All Domain Sizes. *Proceedings of the 48th Annual ACM Symposium on the Theory of Computing (STOC 2016)*.

PAPERS IN  
SUBMISSION

S. Chen, F. Koehler, A. Moitra, M. Yau. Online and Distribution-Free Robustness: Regression and Contextual Bandits with Huber Contamination. arxiv:2010.04157

S. Chen, A.R. Klivans, R. Meka. Learning Deep ReLU Networks Is Fixed-Parameter Tractable. arxiv:2009.13512

S. Chen, A. Moitra. Algorithmic Foundations for the Diffraction Limit. arxiv:2004.07659

TALKS

Learning Deep ReLU Networks Is Fixed-Parameter Tractable  
Northwestern Quarterly Theory Workshop, December 2020  
Simons Institute Workshop: Learning and Testing in High Dimensions, December 2020  
Talks at TTIC, January 2021  
MSR Redmond Machine Learning Foundations Seminar, January 2021

Algorithmic Foundations for the Diffraction Limit  
MIT ML Tea, June 2020

Entanglement is Necessary for Optimal Quantum Property Testing  
Workshop on Local Algorithms, July 2020  
IEEE Symposium on Foundations of Computer Science, November 2020

Learning Polynomials of Few Relevant Dimensions  
Conference on Learning Theory, July 2020

Learning Mixtures of Linear Regressions in Subexponential Time  
CSAIL-MIT Trustworthy AI Collaboration Workshop, November 2019  
MIT LIDS Student Conference, January 2020  
ACM Symposium on Theory of Computing, June 2020  
Highlights of Algorithms, August 2020

Efficiently Learning Structured Distributions from Untrusted Batches

UW Theory Lunch, August 2019  
LIDS & Stats Tea, October 2019  
MIT Center for Deployable Machine Learning Seminar, May 2020  
ACM Symposium on Theory of Computing, June 2020  
Google Research Algorithms Seminar, October 2020

**Beyond the Low-Degree Algorithm: Mixtures of Subcubes and Their Applications**

MIT Theory Lunch, November 2017  
MIT Algorithms and Complexity Seminar, May 2018  
ACM Symposium on Theory of Computing, June 2019

**Improved Bounds for Randomly Sampling Colorings via Linear Programming**

MIT Theory Lunch, April 2018  
MIT Combinatorics Seminar, October 2018  
ACM-SIAM Symposium on Discrete Algorithms, January 2019  
MSR Machine Learning and Optimization Lunch, August 2019

**Basis Collapse for Holographic Algorithms over All Domain Sizes**

National Collegiate Research Conference, January 2016  
Harvard Theory of Computation Seminar, February 2016  
Simons Institute Workshop: The Classification Program of Counting Complexity, March 2016  
ACM Symposium on Theory of Computing, June 2016

SERVICE AND  
OUTREACH

*Journal Reviewing:* Transactions on Algorithms, SIAM Journal on Computing, Foundations and Trends in Theoretical Computer Science, IEEE Transactions on Information Theory  
*Conference Reviewing (external):* STOC, FOCS, SODA, NeurIPS, COLT, ITCS, ICALP, ALT  
Co-organizer, MIT Algorithms and Complexity Seminar  
Co-organizer, MIT Theory Lunch

TEACHING AND  
INDUSTRY  
EXPERIENCE

Teaching Assistant, 6.437 (Information and Inference, graduate), MIT, Spring 2018  
Teaching Fellow, CS 221 (Advanced Complexity Theory, graduate), Harvard, Spring 2016  
Teaching Fellow, CS 125 (Algorithms and Complexity, undergraduate), Harvard, Fall 2015  
Course Assistant, Math 113 (Complex Analysis, undergraduate), Harvard, Spring 2015  
Course Assistant, Math 131 (Topology, undergraduate), Harvard, Fall 2014  
Teaching Fellow, CS E-124 (Data Structures and Algorithms, ext. school), Harvard, Spring 2014  
Course Assistant, Economics 1011a (Microeconomics, undergraduate), Harvard, Fall 2013  
Software Engineer Intern, Khan Academy, Summer 2013