

# JASON GAITONDE

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## RESEARCH INTERESTS

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My research focuses on the interplay between algorithm design, learning theory, probability theory, and game theory. My most recent work in **learning theory** has focused on developing principled algorithms for learning structure in well-studied stochastic environments. Recent research highlights from this line of work include (i) obtaining state-of-the-art algorithms for learning graphical models, (ii) overcoming longstanding computational lower bounds for learning by leveraging correlated data, and (iii) developing the first rigorous PAC-learning algorithms for data generated by graphical models. In **algorithmic game theory**, my research has focused on understanding outcomes of complex learning dynamics between strategic agents. My work provides the first “price of anarchy” guarantees for natural learning dynamics in two fundamental real-world settings: *stateful queuing systems* and *autobidding in online ad auctions*. Moreover, my work in this area has shed light on new models of *opinion formation and polarization* in probabilistic models of network dynamics. I am also broadly interested in machine learning, optimization, and sampling.

## ACADEMIC POSITIONS

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**The Fuqua School of Business, Duke University**  
*Assistant Professor of Business Administration*

**July 2025 - present**

**Massachusetts Institute of Technology**  
Mentored by Professor Elchanan Mossel.  
*Postdoctoral Associate, Department of Mathematics*  
*Instructor of Applied Mathematics*

**July 2023 - June 2025**  
**August 2024 - December 2024**

## EDUCATION

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**Cornell University**  
*Ph.D. in Computer Science*

**August 2018 - June 2023**

Thesis: Dynamics and Phenomena in Stateful Multi-Agent System

Thesis Committee: Éva Tardos (Chair), Robert Kleinberg, Karthik Sridharan, Eshan Chattopadhyay

**Yale University**

**August 2014 - May 2018**

*B.S. in Mathematics (Intensive, with Distinction), B.A. in Economics (summa cum laude)*

## RESEARCH

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### Journal Publications

[1] **The Price of Anarchy of Strategic Queuing Systems**, with Éva Tardos.  
*J. ACM* 70, 3, Article 20: 1-63 (June 2023).  
Available at [DOI:10.1145/3587250](https://doi.org/10.1145/3587250).

[2] **Bounds on the Covariance Matrix of the Sherrington-Kirkpatrick Model**, with Ahmed El Alaoui.  
*Electron. Commun. Probab.* 29: 1-13 (2024).  
Available at [arXiv:2212.02445](https://arxiv.org/abs/2212.02445).

- [3] **Eigenstripping, Spectral Decay, and Edge-Expansion on Posets**, with Max Hopkins, Tali Kaufman, Shachar Lovett, and Ruizhe Zhang.  
*To appear at Theory of Computing (TOC).*  
Available at [arXiv:2205.00644](https://arxiv.org/abs/2205.00644).

### Conference Proceedings

- [4] **Learning Ising Models from Evolutions**, with Ankur Moitra and Elchanan Mossel.  
*To appear at COLT 2026.*  
Available at [arXiv:2507.15173](https://arxiv.org/abs/2507.15173).
- [5] **Comparison Theorems for the Mixing Times of Systematic and Random Scan Dynamics**, with Elchanan Mossel.  
*SIAM Symposium on Discrete Algorithms (SODA 2026)*  
Available at [arXiv:2410.11136](https://arxiv.org/abs/2410.11136).
- [6] **Bypassing the Noisy Parity Barrier: Learning Higher-Order Markov Random Fields from Dynamics**, with Ankur Moitra and Elchanan Mossel.  
*Proceedings of the 57th Annual ACM Symposium on Theory of Computing (STOC 2025).*  
Available at [arXiv:2409.05284](https://arxiv.org/abs/2409.05284).
- [7] **A Unified Approach to Learning Ising Models: Beyond Independence and Bounded Width**, with Elchanan Mossel.  
*Proceedings of the 56th Annual ACM Symposium on Theory of Computing (STOC 2024).*  
Available at [arXiv:2205.08674](https://arxiv.org/abs/2205.08674).
- [8] **Budget Pacing in Repeated Auctions: Regret and Efficiency without Convergence**, with Yingkai Li, Bar Light, Brendan Lucier, and Aleksandrs Slivkins.  
*Extended Abstract in 14th Innovations in Theoretical Computer Science Conference (ITCS 2023).*  
*In submission at Operations Research.*  
Available at [arXiv:2205.08674](https://arxiv.org/abs/2205.08674).
- [9] **Eigenstripping, Spectral Decay, and Edge-Expansion on Posets**, with Max Hopkins, Tali Kaufman, Shachar Lovett, and Ruizhe Zhang.  
*Approximation, Randomization, and Combinatorial Optimization. Algorithms and Techniques (APPROX/RANDOM 2022).*  
Available at [arXiv:2205.00644](https://arxiv.org/abs/2205.00644).
- [10] **Polarization in Geometric Opinion Dynamics**, with Jon Kleinberg and Éva Tardos.  
*Proceedings of the 22nd ACM Conference on Economics and Computation (EC 2021).*  
Available at [arXiv:2106.12459](https://arxiv.org/abs/2106.12459).
- [11] **Virtues of Patience in Strategic Queuing Systems**, with Éva Tardos.  
*Proceedings of the 22nd ACM Conference on Economics and Computation (EC 2021).*  
Available at [arXiv:2011.10205](https://arxiv.org/abs/2011.10205).
- [12] **Fractional Pseudorandom Generators from Any Fourier Level**, with Eshan Chattopadhyay, Chin Ho Lee, Shachar Lovett, and Abhishek Shetty.  
*36th Computational Complexity Conference (CCC 2021).*  
Available at [ECCC - TR20-121](https://arxiv.org/abs/2003.07009).
- [13] **Stability and Learning in Strategic Queuing Systems**, with Éva Tardos.  
*Proceedings of the 21st ACM Conference on Economics and Computation (EC 2020).*  
Available at [arXiv:2003.07009](https://arxiv.org/abs/2003.07009).

- [14] **Adversarial Perturbations of Opinion Dynamics in Networks**, with Jon Kleinberg and Éva Tardos.  
*Proceedings of the 21st ACM Conference on Economics and Computation (EC 2020).*

## Preprints

- [15] **Learning  $AC^0$  Under Graphical Models**, with Gautam Chandrasekharan, Ankur Moitra, and Arsen Vasilyan.  
Available at [arXiv:2604.06109](https://arxiv.org/abs/2604.06109).
- [16] **On Algorithmic Robustness of Corrupted Markov Chains**, with Elchanan Mossel.  
Available at [arXiv:2507.15176](https://arxiv.org/abs/2507.15176).
- [17] **Sample-Efficient Linear Regression with Self-Selection Bias**, with Elchanan Mossel.  
Available at [arXiv:2402.14229](https://arxiv.org/abs/2402.14229).

## INVITED PRESENTATIONS

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### **Learning $AC^0$ Under Graphical Models.**

Duke University, Department of Computer Science, March 2026, Durham, NC.

### **Learning and Dynamics in Multi-Agent Systems.**

Duke University, Department of Computer Science, March 2025, Durham, NC.

### **Efficiently Learning Markov Random Fields from Dynamics.**

TTIC Summer Workshop on Algorithmic Game Theory, July 2025, Chicago, IL.

Applied Probability Society, July 2025, Atlanta, GA.

STOC 2025, June 2025, Prague, CZ.

The Fuqua School of Business, January 2025, Durham, NC.

Cornell University Theory Seminar, August 2024, Ithaca, NY.

### **A Unified Approach to Learning Ising Models.** Available [online](#).

Duke University Probability Seminar, February 2026, Durham, NC.

Physics-Inspired Machine Learning, October 2024, Los Alamos, NM.

STOC, June 2024, Vancouver, CA.

### **Sample-Efficient Linear Regression with Self-Selection Bias.**

Mathematical and Scientific Foundations of Deep Learning, May 2024, San Diego, CA.

### **Budget Pacing in Repeated Auctions: Regret and Efficiency without Convergence.** Available [online](#).

Workshop on Games, Learning, and Networks, April 2024, Singapore.

ITCS, January 2023, Cambridge, MA.

Marketplace Innovation Workshop, May 2022, virtual.

**Fractional Pseudorandom Generators from Any Fourier Level.** Available [online](#).

Purdue University Theory Seminar, March 2023, West Lafayette, IN.

Cornell Theory Tea, February 2022, Ithaca, NY.

**Polarization in Geometric Opinion Dynamics.** Available [online](#).

EC, July 2021, virtual.

**Virtues of Patience in Strategic Queuing Systems.** Available [online](#).

Microsoft Research NYC Machine Learning Seminar, July 2021, virtual.

EC, July 2021, virtual.

Cornell Theory Seminar, February 2021, virtual.

INFORMS, October 2021, virtual.

**Stability and Learning in Strategic Queuing Systems.** Available [online](#).

Microsoft Research Machine Learning Seminar, July 2021, virtual.

INFORMS, October 2021, virtual.

Cornell Theory Seminar, February 2021, virtual.

EC, July 2020, virtual.

**Adversarial Perturbations of Opinion Dynamics in Networks.** Available [online](#).

EC, July 2020, virtual.

## HONORS

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**Cornell Microsoft PhD Fellowship Nominee, CS Department, 2020.**

**Cornell Graduate Fellowship, 2018.**

**Phi Beta Kappa, Yale University, 2018.**

**Tobin Scholar, Yale University, 2018.** Awarded to top four economics majors.

**Morse College Class Marshal, 2018.** Awarded to top two graduating students in Morse College.

## TEACHING AND MENTORSHIP EXPERIENCE

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**Instructor for BA 990S.01, Topics in Learning Theory (Ph.D),** Duke University, Spring, 2026.

**Instructor for DEC 610, Foundations of Business Analytics,** Duke University, Fall I, 2025.

**Instructor for 18.424, Seminar on Information Theory,** Massachusetts Institute of Technology, Fall 2024.

**Undergraduate Research Supervisor,** Massachusetts Institute of Technology.

*Mentees:* Akshaya Chakravarthy (Fall 2024), Donald Stralkus (Spring 2024), Dylan Yu (Spring 2024)

## PROFESSIONAL SERVICE

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**General Program Committee:** AAAI (2025, 2026), COLT (2023, 2024, 2025, 2026), EC (2024, 2025, 2026)

**Conference Reviewer:** AAAI (2025, 2026), COLT (2023, 2024, 2025, 2026), EC (2024, 2025, 2026), ICALP (2026), ICML (2022 Outstanding Reviewer, 2024), ICLR (2024), ITCS (2021), FOCS (2025), NeurIPS (2021, 2022, 2023), RANDOM (2025), SODA (2022, 2025), STOC (2019, 2025, 2026), TheWebConf (2024)

**Journal Reviewer:** Operations Research, JACM, JCSS, IEEE Transactions of Information Theory, Electronic Communications in Probability

**Peer Mentorship:** EC, Learning Theory Alliance

## **INDUSTRY EXPERIENCE**

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**Student Researcher, Google Research, New York City**  
*Mentored by Mehryar Mohri and Aranyak Mehta*

**October 2022 - June 2023**

**Student Researcher, Microsoft Research New England**  
*Mentored by Brendan Lucier*

**June 2021 - August 2021**