Amit Rajaraman

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🌐 https://amitrajaraman.github.io/

Research Interests

Theoretical computer science, Markov chains, inference, optimization, sum-of-squares method

Education

2023–Present	**Massachusetts Institute of Technology** PhD in Computer Science	
2019–2023	**Indian Institute of Technology Bombay, India** B.Tech. with Honors in Computer Science Minor in Mathematics	9.75 CPI (top 10% of department)
2017–2019	**Sri Chaitanya Junior College, India** Intermediate/+2	97.80%
2010–2017	**Delhi Public School, Hyderabad, India** Matriculation	10.0 GPA

Publication(s)

1. D. Lee, F. Pernice, **A. Rajaraman**, and I. Zadik, "The Fundamental Limits of Recovering Planted Subgraphs," *arXiv preprint arXiv:2503.15723*, 2025, To appear in COLT 2025.

2. B. Huang, S. Mohanty, **A. Rajaraman**, and D. X. Wu, "Weak Poincaré Inequalities, Simulated Annealing, and Sampling from Spherical Spin Glasses," *arXiv preprint arXiv:2411.09075*, 2024, To appear in STOC 2025.

3. K. Liu, S. Mohanty, P. Raghavendra, **A. Rajaraman**, and D. X. Wu, "Locally Stationary Distributions: A Framework for Analyzing Slow-Mixing Markov Chains," in *2024 IEEE 65th Annual Symposium on Foundations of Computer Science (FOCS)*, Los Alamitos, CA, USA: IEEE Computer Society, 2024, pp. 203–215. 🔗 DOI: 10.1109/FOCS61266.2024.00022.

4. K. Liu, S. Mohanty, **A. Rajaraman**, and D. X. Wu, "Fast Mixing in Sparse Random Ising Models," in *2024 IEEE 65th Annual Symposium on Foundations of Computer Science (FOCS)*, Los Alamitos, CA, USA: IEEE Computer Society, 2024, pp. 120–128. 🔗 DOI: 10.1109/FOCS61266.2024.00018.

5. H. Narayanan, **A. Rajaraman**, and P. Srivastava, "Sampling from convex sets with a cold start using multiscale decompositions," *Probability Theory and Related Fields*, 2024, An extended abstract of this paper appeared in the ACM Symposium on Theory of Computing (STOC) 2023, ISSN: 1432-2064. 🔗 DOI: 10.1007/s00440-024-01341-w.

Service

🔖 **Teaching Assistantship**

2024   **6.S977 (The Sum of Squares Method)**   *Instructor: Prof. Sam Hopkins*

Responsible for holding office hours to answer questions, as well as designing problem sets and preparing notes for the course

2023   **CS 228 (Logic for CS)**   *Instructors: Prof. Ashutosh Gupta and Prof. Krishna S.*

2020   **MA 109 (Calculus I)**   *Instructor: Prof. Ravi Raghunathan*

Responsible for conducting tutorial sessions for a batch of students throughout the semester, answering questions through personal interaction, and correcting answer sheets

2021–2022   🔖 **Mentor, Summer of Science**

Guided students interested in topology and graph theory by creating an action plan, recommending resources, having discussions, and reviewing their reports

2020–2023   🔖 **Notes**

Prepared notes for various undertaken courses and other topics, referred to by hundreds of peers, which can be found at amitrajaraman.github.io/notes

Scholastic Achievements

2023   🔖 Awarded the Akamai Presidential Fellowship for exemplary academic and research achievements

2019   🔖 Secured All India Rank 12 in JEE Advanced among 245,000 aspirants

2019   🔖 Secured All India Rank 102 in JEE Main among 1.2 million aspirants

🔖 Conferred an AP grade for exceptional performance in

    2022   MA214 (Numerical Analysis), awarded to 7 out of 739 students

    2020   MA106 (Linear Algebra), awarded to 8 out of 1108 students

    2019   CS101 (Computer Programming and Utilization), awarded to 1 out of 1212 students

    2019   MA105 (Calculus), awarded to 35 out of 1137 students

    2019   PH107 (Quantum Physics and Application), awarded to 12 out of 1115 students

2017   🔖 Recipient of the prestigious Kishore Vaigyanik Protsahan Yojana (KVPY) Fellowship

Technical Skills

Software   🔖 LaTeX, MATLAB, Git, LEAN

Programming   🔖 C++, C, Python, Bash, Julia

Select Courses Undertaken

Computer Science   🔖 Algorithmic Statistics, Discrete Probability and Stochastic Processes, Information Theory, Derandomization and Pseudorandomness

Mathematics   🔖 Weak Convergence and Martingale Theory, Graph Theory, Combinatorics I, Topics in Algebra II, Real Analysis, Complex Analysis, General Topology