Tarun Kathuria

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RESEARCH INTERESTS
: Iterative methods for Convex and Non-Convex Optimization, High-Dimensional Probability and Stochastic Processes, Randomized Numerical Linear Algebra, Random Matrix Theory and applications to Machine Learning and Database Theory

EMPLOYMENT

Adobe Research, San Jose, CA　　　　　　　　　　　　　　　*Feb 2023 - June 2023*
Summer Intern　　　　　　　　　　　　　　　　　　　　　*Mentor: Dr. Anup Rao*
- Worked on designing new accelerated diffusion models for image generation
- Obtained significant speed-ups (33% lesser sampling time) on MNIST, CIFAR-10, ImageNet generation with competing FID scores to HuggingFace's DPM-Solver Implementation

Microsoft Research India, Bangalore　　　　　　　　　　　　*July 2015 - July 2017*
Research Fellow, Algorithms and Theory Group　　　　　　*Mentor: Dr. Amit Deshpande*
- Worked on theoretical and applied problems in optimization and randomized numerical linear algebra problems
- Published some of this work in the context of Bayesian optimization (NIPS 2016) and Fairness in Machine Learning (FATML2016, ICML 2018).

IBM Research India, Bangalore　　　　　　　　　　　　　　　*Summer 2014*
Summer Intern, Data Mining Group　　　　　*Mentor: Dr. Indrajit Bhattacharyya*

EDUCATION

University of California, Berkeley　　　　　　　　　　*August 2017 - Present*
Doctor of Philosophy (Ph.D.)　　　　　　　　　　Advisor: Prasad Raghavendra
- Major: Computer Science (Convex Optimization and Graph Algorithms)
- Minor: Mathematics

Indian Institute of Technology - Bombay　　　　　　　*July 2011 - June 2015*
Bachelor of Technology (Honors)
- Major: Computer Science & Engineering
- Minor: Applied Statistics and Informatics

PUBLICATIONS

1. Ankit Garg, Tarun Kathuria, Nikhil Srivastava Scalar Poincare implies Matrix Poincare. Electronic Communications in Probability (26), 2021.

2. Tarun Kathuria. A Potential Reduction Inspired Algorithm for Exact Max Flow in Almost $O(m^{4/3})$ Time. *61st IEEE Annual Symposium on Foundatins of Computer Science,* **(FOCS 2020)**

3. Haotian Jiang, Tarun Kathuria, Yin Tat Lee, Swati Padmanabhan, Zhao Song. A Faster Interior Point Method for Semidefinite Programming. *61st IEEE Annual Symposium on Foundations of Computer Science,* **(FOCS 2020)**

4. Yeshwanth Cherpanamjeri, Samuel B. Hopkins, Tarun Kathuria, Prasad Raghavendra, Nilesh Tripuraneni. Algorithms for heavy-tailed statistics: regression, covariance estimation, and beyond. *52nd Annual ACM-SIGACT Symposium on Theory of Computing,* **(STOC 2020)**

5. Tarun Kathuria, S. Sudarshan. Efficient and Provable Multi-Query Optimization. *Proceedings of the 36th ACM SIGMOD-SIGACT-SIGART Symposium on Principles of Database Systems* **(PODS 2017)**

6. Tarun Kathuria, Amit Deshpande, Pushmeet Kohli. Batched Gaussian Process Bandit Optimization via Determinantal Point Processes. *Advances in Neural Information Processing Systems* **(NIPS 2016)**

7. L. Elisa Celis, Amit Deshpande, Tarun Kathuria, Nisheeth K. Vishnoi. How to be Fair and Diverse? *3rd Workshop on Fairness, Accountability, and Transparency in Machine Learning* **(FATML 2016)**

MANUSCRIPTS

1. Tarun Kathuria, Satyaki Mukherjee, Nikhil Srivastava. On Concentration Inequalities for Random Matrix Products. 2020

2. Tarun Kathuria. A Matrix Bernstein Inequality for Strong Rayleigh Distributions. 2020

EXTERNAL REVIEWER
: Conference on Learning Theory (COLT), Neural Information Processing Systems (NIPS), International Conference on Machine Learning (ICML), Symposium on Discrete Algorithms (SODA), Foundations of Computer Science (FOCS), Symposium on Theory of Computing (STOC)

Teaching Experience	**Graduate Student Instructor, UC Berkeley** *Course : Convex Optimization (EECS127/227A)*	*Fall 2022, Spring 2023, Fall 2023*
	Graduate Student Instructor, UC Berkeley *Course : Efficient Algorithms and Intractable Problems (CS170)*	*Fall 2018, Spring 2019*
	Undergraduate Teaching Assistant, IIT Bombay *Course : Introduction to Numerical Analysis*	*Summer 2013, Spring 2014, Spring 2015*
	Undergraduate Teaching Assistant, IIT Bombay *Course : Linear Algebra*	*Autumn 2014*
	Undergraduate Teaching Assistant, IIT Bombay *Course : Electricity & Magnetism*	*Autumn 2012*

Technical Skills	**Programming**	Python, Julia, C++, Java
	Machine Learning	Pytorch, TensorFlow, Scikit-learn