

Ativ Joshi

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Education

University of Massachusetts, Amherst

PhD Computer Science

CGPA: 3.7/4.0

Amherst, MA, USA

Aug'23 - present

Chennai Mathematical Institute

MSc Computer Science

CGPA: 8.75/10 (Link to [transcript](#))

Chennai, TN, India

Aug'19 - Jun'21

Ahmedabad University

BTech in Information and Communication Technology

CGPA: 3.64/4.33 (Link to [transcript](#))

Ahmedabad, Gujarat, India

Aug'15 - May'19

Interests

Online Optimization, Convex Optimization, Linear Programming, Resource Allocation, CDN Caching, Bandits, Natural Language Processing, Graphical Models, Mathematical Modeling, Game Theory, Information Theory, Machine Learning

Publications

Y. Chittepu, **A. Joshi**, R. Bhattacharjee, and S. Niekum. Safe RLHF beyond expectation: Stochastic dominance and optimal transport for universal spectral risk control. Working paper, 2026.

A. Joshi, R. Bhattacharjee, R. De, C. Musco, A. Sinha, and M. Hajiesmaili. Online caching in tree networks: Algorithms, regret, and complexity. Accepted at Learning for Dynamics and Control, 2026.

A. Joshi, Q. Liu, and M. Hajiesmaili. Learning to allocate reusable resources under stochastic rewards and durations. Under review at SIGMETRICS, 2026.

A. Sinha, **A. Joshi**, R. Bhattacharjee, C. Musco, and M. Hajiesmaili. No-regret algorithms for fair resource allocation. *NeurIPS*, 2023.

A. Joshi and A. Sinha. Universal caching. In *2022 IEEE Information Theory Workshop (ITW)*, pages 684–689, 2022.

Technical Skills

- **Languages & Scripts:** C, C++, Java, Python, Shell
- **Tools & Libraries:** PyTorch, TensorFlow, Matlab, Maple, Numba, SageMath, SciPy/NumPy, SymPy, Verilog

Research Experience

Research Assistant

Tata Institute of Fundamental Research & IIT-Madras

- Worked on Online Learning algorithms for network caching at Learning and Networks Group.

Mumbai, India

Jul'21 - Jul'23

Research Intern (MSc Thesis)

IISc, Bangalore,

- Project 1: We survey the nature of the capacity achieving input distribution of the AWGN channel, its behavior as the amplitude constraint is relaxed, and certain bounds on its support. Lastly we made an attempt at generalizing the bounds in a discrete setting.
- Project 2: Read papers on the use of Message Passing Algorithms (MPAs) to bound the the number of k-matchings in bipartite graphs. The bounds are achieved asymptotically for a sequence of 2-lifts of the original graph. These graphical models can also be used to approximate the permanents and subpermanent sums of positive matrices. We also conducted basic experiments to check efficiency of MPA to approximate permanents of various ensembles of sparse matrices.
- Links to [Project 1](#) and [Project 2](#)

Chennai, India

Aug'20 - Jun'21

Research Intern (BTech Project)

Chennai Mathematical Institute

- Worked on approximating the permanent of a matrix using Markov Random Fields.
- The primary approach is to create a Markov Random Field whose partition function is the permanent of a square matrix. Then use Belief Propagation to compute Bethe Free Energy which approximates the permanent. We then try to generalize the algorithm to compute permanent of rectangular matrices. (The internship was a part of my bachelor's thesis).
- Links to [Code](#) and [Report](#)

Chennai, India

Jan'19 - May'19

Summer Student

Institute of Mathematical Sciences

Chennai, India

May'18 - Jul'18

- Studied and presented a parameterized algorithm to approximately count the number of k-paths in a directed graph by embedding the graph into Exterior (or Grassmann) Algebra.
- Attended lectures on topics of theoretical computer science like Parameterized Complexity, Automata Theory, Games and Distributed Algorithms, Computational Geometry, Logic etc.
- : Link to [Certificate](#)

Research Intern

IIT-Gandhinagar

Gandhinagar, India

May'17 - July'18

- Studied and implemented the methods of sparse polynomial interpolation and sparse GCD computation for multivariate polynomials.
- Topics studied include Zippel's work on sparse interpolation, Ben-Or/Tiwari's Deterministic interpolation algorithm, early termination approach by Kaltofen et. al., non monic case of sparse GCD by de Kleine et. al., parallel GCD algorithm by Monagan/Hu etc. Implementation is done in Python using SymPy. (Started as a summer intern and later visited IIT-Gn weekly during the third year of BTech).
- Links to [Certificate](#), [Code](#) and [Report](#)

Teaching Experience

Teaching Assistant

University of Massachusetts, Amherst

Amherst, MA, India

Sep'25 - Dec'25

- CS 515: Algorithms, Game Theory and Fairness

Teaching Assistant

University of Massachusetts, Amherst

Amherst, MA, India

May'25 - Jul'25

- CS 683: Artificial Intelligence

Teaching Assistant

University of Massachusetts, Amherst

Amherst, MA, India

Jan'25 - May'25

- CS 250: Introduction to Computation

Teaching Assistant

University of Massachusetts, Amherst

Amherst, MA, India

Sep'24 - Dec'24

- CS 689: Machine Learning

Teaching Assistant

Ahmedabad University

Ahmedabad, India

Aug'18 - Dec'18

- CSC210-Data Structures and Algorithms course.

Relevant Courses

BTech

- Algorithmic Game Theory
- Information and Coding Theory
- Algorithms and Optimisation for Big Data
- Computer Networks
- Signals and Systems
- Analog and Digital & Communications
- Wireless Communications
- Digital Signal Processing

MSc

- Reinforcement Learning
- Computational Complexity
- Game Theory
- Stochastic Processes
- Linear Programming & Combinatorial Optimization
- Graph Theory

PhD

- CS 689: Machine Learning
- CS 614: Randomized Algorithms
- CS 660: Advance Information Assurance
- CS 685: Advanced Natural Language Processing
- CS 646: Advanced Information Retrieval

Achievements & Other Activities

- Winner of *The Ingenious Hackathon - 2017*, Tech Fest at SEAS, Ahmedabad University.
- Selected for *ICPC Regionals - 2017*, Hindustan University.
- Member of Registration Committee for the 38th IARCS Annual Conference on *Foundations of Software Technology and Theoretical Computer Science (FSTTCS)*, 2018 held at Ahmedabad University.
- Recipient of *Cognizant Foundation Scholarship* (covers the tuition fees for MSc).
- Member of [App Development Team](#) of *Indian Scientists' Response to CoViD-19 (ISRC)* group. Helped develop an SMS-based E-Token system called [SMALL-BAG](#), which helped local vendors to take their business online.
- Conferences attended: [FSTTCS](#), 2018; [Workshop on Algebraic Complexity Theory](#), 2019; [Youth in High-Dimensions](#), 2021(held online); [Information Theory Workshop](#), 2022; [NeurIPS](#), 2023.