

RESEARCH INTERESTS

Sublinear Algorithms for large scale data, Computational Linear Algebra, Machine Learning, Optimization

EDUCATION

University of Massachusetts Amherst

2020–Current

Ph.D. in Computer Science, GPA: 4.0/4.0

– Advisor: Prof. Cameron Musco

Indian Statistical Institute

2015–2017

Master of Technology in Computer Science, Final Aggregate: 85.90 % (First Class with Distinction)

Jadavpur University

2009–2013

Bachelor of Engineering in Mechanical Engineering, GPA: 7.86/10.00 (First Class)

PUBLICATIONS AND PREPRINTS

(*): alphabetical ordering

1. **Sublinear Time Eigenvalue Approximation via Random Sampling.** (*) Rajarshi Bhattacharjee, Cameron Musco and Archan Ray. 2021. Preprint at [\[arxiv\]](#)
2. **Fundamental Limits on the Regret of Online Network-Caching.** Rajarshi Bhattacharjee, Subhankar Banerjee and Abhishek Sinha. *Proceedings of the ACM on the Measurement and Analysis of Computing Systems*, Vol 4, No. 2, Article 25, 2020. Also published at *ACM SIGMETRICS 2020* [\[PDF\]](#)
3. **Optimizing the Age-of-Information for Mobile Users in Adversarial and Stochastic Environments.** Abhishek Sinha and Rajarshi Bhattacharjee. Under submission at *IEEE Transactions on Information Theory*, 2020. [\[arxiv\]](#)
4. **Fundamental limits of age-of-information in stationary and non-stationary environments.** Subhankar Banerjee, Rajarshi Bhattacharjee and Abhishek Sinha. In *2020 IEEE International Symposium on Information Theory (ISIT)*, 2020. [\[arxiv\]](#)
5. **Competitive algorithms for minimizing the maximum age-of-information.** Rajarshi Bhattacharjee and Abhishek Sinha. *Workshop on Mathematical performance Modeling and Analysis (MAMA)*, *ACM SIGMETRICS 2020*. [\[PDF\]](#)
6. **Online Algorithms for Multiclass Classification Using Partial Labels.** Rajarshi Bhattacharjee and Naresh Manwani. *Proceedings of the Pacific-Asia Conference on Knowledge Discovery and Data Mining (PAKDD)*, 2020. [\[arxiv\]](#)

RESEARCH EXPERIENCE

University of Massachusetts Amherst

Amherst, MA

Graduate Research Assistant

Fall 2020–Current

- Working on estimating the eigenspectrum of a symmetric matrix in sublinear time by sampling random submatrices.

- Worked on finding the lower bound of the number of entries to be sampled by any algorithm for estimating the second eigenvalue of a kernel matrix.
- Area: Randomized Linear Algebra, Data science, Fine-grained complexity

Indian Institute of Technology (IIT) Madras

Chennai, India

Project Associate under Prof. Abhishek Sinha

July 2019–August 2020

- Worked on the problem of optimal caching of files in a network from the point of view of online learning (specifically online linear optimization over a simplex). We derived tight non-asymptotic *regret lower bounds* for this problem showing that online gradient decent is close to optimal for this problem.
- Worked on the problem of minimizing the age-of-information (AoI) for users in a communication network. Proposed policies with a small *competitive ratio* for minimizing AoI in an online setting.
- Area: Online Convex Optimization, Machine Learning, Age-of-information of Communication networks

Indian Institute of Information Technology (IIIT) Hyderabad

Hyderabad, India

Research Assistant under Prof. Naresh Manwani

February 2018–May 2019

- Worked on online learning algorithms based on perceptron and pegasos for the weakly supervised setting of learning with partial labels. Derived mistake bounds and regret bounds for the algorithms.
- Area: Online learning, Optimization

PROFESSIONAL EXPERIENCE

Deloitte Consulting India Private Limited

Hyderabad, India

Business Analyst/Data Scientist

August 2017–December 2017

- Worked in the Data Science division involved in providing machine learning based solutions to clients

PricewaterhouseCoopers Private Limited

Chennai, India

Consultant

September 2013–July 2015

- Work involved development of software modules using Java, Oracle ADF and PLSQ for clients after understanding requirement.

SCHOLARSHIPS AND AWARDS

- Awarded **Sudha and Rajesh Jha Scholarship** at UMass Amherst. (awarded to one student every year)
- **Rashi Ray Memorial Medal** for standing **First** in the order of merit in M.Tech. Computer Science at Indian Statistical Institute
- Awarded **Dean's Fellowship** along with admission to the **PhD program** in Electrical and Systems Engineering at **Boston University**. (declined offer)

SERVICE

- Helped Prof. Abhishek Sinha review papers for **IEEE Transactions on Networking**
- Helped Prof. Naresh Manwani review papers for **IJCAI, IJCNN**

RELEVANT COURSEWORK

Advanced Algorithms, Optimization, Machine Learning, Probabilistic Graphical Models

PROGRAMMING LANGUAGES

Python, C, Java, Matlab