Rajarshi Bhattacharjee

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Research Interests

Theoretical Computer Science, Machine Learning (specifically online learning), Randomized Linear Algebra

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. (*) Rajarshi Bhattacharjee, Cameron Musco and Archan Ray. **Sublinear Time Eigenvalue Approximation via Random Sampling.** *2021. Preprint at* [arxiv]

2. Abhishek Sinha and Rajarshi Bhattacharjee. **Optimizing the Age-of-Information for Mobile Users in Adversarial and Stochastic Environments.** *Under submission at* ***IEEE Transactions on Information Theory****, 2020.* [arxiv]

3. Rajarshi Bhattacharjee, Subhankar Banerjee and Abhishek Sinha. **Fundamental Limits on the Regret of Online Network-Caching.** ***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]

4. Subhankar Banerjee, Rajarshi Bhattacharjee and Abhishek Sinha. **Fundamental limits of age-of-information in stationary and non-stationary environments.** *In 2020 IEEE International Symposium on Information Theory* ***(ISIT), 2020****.* [arxiv]

5. Rajarshi Bhattacharjee and Abhishek Sinha. **Competitive algorithms for minimizing the maximum age-of-information.** *Workshop on MAthematical performance Modeling and Analysis (MAMA),* ***ACM SIGMETRICS 2020****.* [PDF]

6. Rajarshi Bhattacharjee and Naresh Manwani. **Online Algorithms for Multiclass Classification Using Partial Labels.** *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

- Our work proves that we can estimate eigenvalues (upto an additive approximation factor) of symmetric matrices in sublinear time by sampling random submatrices
- Area: Randomized Linear Algebra, Data science

Indian Institute of Technology (IIT) Madras Chennai, India
Project Associate under Prof. Abhishek Sinha July 2019–August 2020

- The problem of online caching of files is equivalent to an online optimization problem over a simplex. We derived tight *regret lower bounds* for this problem showing that online gradient decent is actually optimal.
- Proposed simple to implement policies with a bounded *competitive ratio* for minimizing the age-of-information for users in a network 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

- Developed online algorithms based on perceptron and pegasos for the weakly supervised setting of learning with partial label. 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