Prathamesh Mayekar

Linkedin: https://www.linkedin.com/in/prathamesh-mayekar-04269a28/ Email: pratha22@nus.edu.sg
Github: https://github.com/prathamesh220 Nationality: Indian

Title

Research Scientist at National University of Singapore, Singapore *Present*

Research Interest

Applied Research: Computational Advertising, Federated Learning.

Theoretical Research: Information Theory, Applied Probability, Stohastic Optimization, Statistics under Information Constraints, Multi-Armed Bandits.

Education

Indian Institute of Science, Bengaluru,

Ph.D., Electrical and Communication Engineering *July' 16-July' 21*

- Thesis Topic: *Compression Algorithms for Distributed Computing and Learning*

Indian Institute of Technology Bombay, Mumbai,

M.Tech., Industrial Engineering and Operations Research *July'13-June'15*

- Thesis Topic: *Multi-armed Bandit Approach to Dynamic Pricing*

K.J.Somaiya College of Engineering, Mumbai,

B.E, Electronics and Communication Engineering *July'09-June'13*

Honors and Awards

1. Recipient of the Jack Keil Wolf Student Paper Award (Best Student Paper Award) at International Symposium on Information Theory (ISIT), 2018, Colorado, USA.
2. Recipient of the Wipro PhD. Fellowship, Indian Institute of Science, 2018, Bangalore, India.
3. Finalist for Qualcomm Innovation Fellowship, 2018, Bangalore, India.
4. Best Poster Presentations at Supply Chain Practitioner's Council (SCPC), Mumbai Chapter. 2015, Mumbai, India.

Work Experience

National University of Singapore, Singapore *Present*

Research Scientist

Research Fellow in the Computer Science Department at National University of Singapore. I work on problems at the intersection of Federated Learning, Online Learning, and Information Theory.

Huawei Research, India *February' 22- August' 22*

Research Scientist

- I worked in the area of computational (programmatic) advertising. Specifically, I worked on building deep learning models for various ad types to increase their click-through rate and conversion rate (CTR/CVR).
- My efforts were recognized by three awards: I was part of one of the two teams to be awarded the Huawei India, CEO award; I was one of the two employees from Huawei Research, India, to be awarded the Timely Incentive Award for the Second Quarter (Best performer award for the second quarter); I also received the SPOT award for July (best performer award for the month of July).

Indian Urban Data Exchange (IUDX), India *August' 21 - January' 22*

Research Scientist

I broadly worked in the area of differential privacy. Specifically, I worked on creating differentially private data pipelines for various public queries.

TCS Innovation Lab (TRDDC), India. *July'15-July'16*

Software Engineer

Conducted research in the area of supply-chain systems, IT systesm using queuing theory and optimization theory. Built a "what-if simulation engine" for a client using discrete even simulation framework Simpy in Python.

Journal Publications

1. **P Mayekar**, S Jha, A T Suresh, and H Tyagi. Wyner-Ziv Estimators for Distributed Mean Estimation with Side Information and Optimization, submitted.
2. S Jha, **P Mayekar**, and H Tyagi. *Fundamental limits of over-the-air optimization: Are analog schemes optimal?*, IEEE Journal on Selected Areas in Information Theory (Special Issue on Distributed Coding and Computation).
3. **P Mayekar** and H Tyagi. *RATQ: A Universal Fixed-Length Quantizer for Stochastic Optimization*, IEEE Transactions on Information Theory.
4. **P Mayekar**, P Parag, and H Tyagi. *Optimal Source Codes for Timely Updates*, IEEE Transactions on Information Theory.

Conference Publications

1. **P Mayekar**, S Jha, and H Tyagi. *Wyner-Ziv Compression is optimal for distributed optimization,* in proceedings of IEEE International Symposium on Information Theory (ISIT), 2022, Aalto, Finland.
2. S Jha, **P Mayekar**, and H Tyagi. *Fundamental limits of over-the-air optimization: Are analog schemes optimal?* in proceedings of IEEE Global Communications Conference (GLOBECOM), 2021, Madrid, Spain.
3. J Acharya, C Canonne, **P Mayekar**, and H Tyagi. *Information-constrained optimization: Can adaptive processing of gradients help?*, in proceedings of Neural Information Processing Systems (NeurIPS), 2021.
4. **P Mayekar**, A T Suresh, and H Tyagi. *Wyner-Ziv Estimators: Efficient Distributed Mean Estimation with Side Information*, in proceedings of International Conference on Artificial Intelligence and Statistics (AISTATS), 2021.
5. **P Mayekar** and H Tyagi. *Limits on gradient compression for stochastic optimization*, in proceedings of IEEE International Symposium on Information Theory (ISIT), 2020, Los Angeles, USA.
6. **P Mayekar** and H Tyagi. *RATQ: A Universal Fixed-Length Quantizer for Stochastic Optimization*, in proceedings of International Conference on Artificial Intelligence and Statistics (AISTATS), 2020, Palermo, Italy.
7. **P Mayekar**, P Parag, and H Tyagi. *Optimal Lossless Source Codes for Timely Updates*, in proceedings of IEEE International Symposium on Information Theory (ISIT), 2018, Vail, USA. (Winner of the *Jack Keil Wolf Student Paper Award.*)

Major Courses

Analysis, Information Theory, Probability Theory, Concentration Inequalities, Detection and Estimation Theory, Topics in Information Theory and Statistical Learning, Stochastic Processes and Queuing Theory, Optimization Techniques, Integer Linear Programming, Network Flow and Algorithms, Markov Decision Processes, Game Theory, Foundations of Data Science.

Computing Skills

Programming Languages: Python, Tensorflow.
Modeling and Computational Software: AMPL, CPLEX.

Professional Service

Reviewer

Information Theory

- IEEE Transactions on Information Theory (TIT).
- IEEE Journal on Selected Areas in Information Theory (JSAIT).
- IEEE Transactions on Communication (TCOM).
- IEEE International Symposium on Information Theory (ISIT).
- IEEE Information Theory Workshop (ITW).

Machine Learning

- Conference on Neural Information Processing Systems (NeurIPS).
- International Conference on Representation Learning (ICLR).
- International Conference on Artificial Intelligence and Statistics (AISTATS).

Teaching Assistant

Indian Institute of Science, Bengaluru.

- Random Processes, E2 202 *Autumn'18*

Indian Institute of Technology Bombay, Mumbai.

- Markov Decision Processes, IE 708. *Spring'15*
- Introduction to Stochastic Models, IE 611. *Autumn'14*