Avik Kar

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Info

Webpage `https://avik-kar.github.io/`
Github `https://github.com/avik-kar`
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Research Interests

My research interests broadly lie in the areas of reinforcement learning and online learning. Currently, my research focuses on designing low-complexity learning algorithms for large systems, using ideas from probability theory, optimization, and information theory.

Education

2021-present **Indian Institute of Science, Bangalore**
PhD in Engineering, Dept of Electrical Communication Engineering , *Current course CGPA – **9.2/10***
- **Fellowship: Prime Minister's Research Fellowship** from *Aug 2022* to *Jul 2025*

2019–2021 **Indian Institute of Technology Kharagpur**
M.Tech in Electrical Engineering with specialization in Instrumentation and Signal Processing, *CGPA – **9.15/10***
- **Thesis:** Federated Learning of Deep Neural Networks with Weakly Labelled Private Datasets
- **Award: Keshab K Parhi Endowment Prize** for **best application-oriented thesis** among M.Tech. graduating students of EECS division

2013—2017 **St. Thomas' College of Engineering and Technology, Kolkata**
B.Tech in Electronics and Communication Engineering , *Score – **8.54/10***
- **Thesis:** Microstrip Line Implementation of X-band Microwave Filter

Publications and Preprints

1. **Provably Adaptive Average Reward Reinforcement Learning for Metric Spaces**
   Authors: Avik Kar and Rahul Singh
   arXiv preprint arXiv:2410.19919.

2. **Fantom: Federated Adversarial Network for Training Multi-Sequence Magnetic Resonance Imaging in Semantic Segmentation**
   Authors: Anupam Borthakur, Apoorva Srivastava, Avik Kar, Dipayan Dewan, and Debdoot Sheet
   International Conference on Image Processing (ICIP). IEEE, 2024.

3. **Linear Bandits With Side Observations on Networks**
   Authors: Avik Kar, Rahul Singh, Fang Liu, Xin Liu, and Ness B. Shroff
   IEEE/ACM Transactions on Networking, 2024.

4. **Policy Zooming: Adaptive Discretization-based Infinite-Horizon Average-Reward Reinforcement Learning**
   Authors: Avik Kar and Rahul Singh
   arXiv preprint arXiv:2405.18793.

5. **Finite Time Logarithmic Regret Bounds for Self-Tuning Regulation**
   Authors: Rahul Singh, Akshay Mete, Avik Kar, and P R Kumar
   41st International Conference on Machine Learning (ICML), 2024.

6. **Federated Learning for Site Aware Chest Radiograph Screening**
   Authors: Arunava Chakravarty, Avik Kar, Ramanathan Sethuraman, and Debdoot Sheet
   18th International Symposium on Biomedical Imaging (ISBI). IEEE, 2021.

Coursework

Postgraduate	Optimization, Random Processes, Reinforcement Learning, Statistical Learning Theory, Online Learning, Real Analysis, Measure Theory, Queueing Theory, Stochastic Control, Statistical Signal Processing, Matrix Theory and Linear Algebra
Undergraduate	Linear Algebra, Probability Theory, Signals and Systems, Control Systems, Digital Signal Processing, Analog Communication, Digital Communication

Technical Skills

Programming Languages	python, C++, Matlab
Software Packages	LaTeX, Pytorch, OpenAI Gym, Mujoco, Scikit-learn

Teaching

spring, 2025	**Online Learning and Bandit Algorithms**. Role: Instructor. Course link: Coming up.
Fall, 2024	**Reinforcement Learning**. Role: Teaching Assistant. Course link: `https://archive.nptel.ac.in/courses/106/106/106106143/`
Fall, 2023	**Bandit Algorithm (Online Machine Learning)**. Role: Teaching Assistant. Course link: `https://archive.nptel.ac.in/courses/106/101/110101145/`
Spring, 2023, 2024	**Markov Decision Processes**. Role: Instructor. Course link: `https://avik-kar.github.io/ta/index.html`
Fall, 2022	**Random Processes**. Role: Teaching Assistant. Course link: `https://ece.iisc.ac.in/~parimal/2022/random/`

Professional Experiences

Aug 2017 – May 2018) **Nomura Research Institute Financial Technology India**
Role: Associate Software Engineer
Worked in project of building Broker Back-office Platform. Learned Test Automation with Selenium and SQL database, Data Migration.

References

Available upon request