

RESEARCH INTEREST	Multi-armed Bandits, Bayesian Optimization, Reinforcement Learning
EDUCATION	<p>[2016-Present] PhD student in Indian Institute of Science (IISc) CGPA 9.3/10</p> <p>[2013-15] M.E. in System Science and Automation (SSA), IISc CGPA 7.4/8 Project Grade S (Highest achievable grade)</p> <p>[2008-12] B.E. in Electrical Engineering, Jadavpur University 1st Class with a CGPA of 8.74/10</p> <p>[2000-08] Habra High School, West Bengal, India 85.8% in Higher Secondary Examination (+2 level), 2008 95.5% in Secondary Examination (10 level), 2006</p>
WORK EXPERIENCE	<p>[2015-16] Project Associate in ECE Department, IISc</p> <p>[2015] Associate Data Analytics Engineer in IBM India Pvt. Ltd</p>
PUBLICATIONS	<p>1. Online Learning in Kernelized Markov Decision Processes. <i>Sayak Ray Chowdhury</i>, Aditya Gopalan. International Conference on Artificial Intelligence and Statistics (AISTATS), 2019.</p> <p>2. On Kernelized Multi-armed Bandits. <i>Sayak Ray Chowdhury</i>, Aditya Gopalan. International Conference on Machine Learning (ICML), 2017.</p> <p>3. Misspecified Linear Bandits. Avishek Ghosh, <i>Sayak Ray Chowdhury</i>, Aditya Gopalan. AAAI Conference on Artificial Intelligence (AAAI), 2017.</p>
WORKSHOP PAPERS	<p>1. Online Learning in Kernelized Markov Decision Processes. <i>Sayak Ray Chowdhury</i>, Aditya Gopalan. Infer to Control: Probabilistic Reinforcement Learning and Structured Control workshop, Neural Information Processing Systems, 2018.</p> <p>2. On Batch Bayesian Optimization. <i>Sayak Ray Chowdhury</i>, Aditya Gopalan. All of Bayesian Nonparametrics workshop, Neural Information Processing Systems, 2018.</p>
RESEARCH PROJECTS	<p>A. Online Learning in Social Networks</p> <p>□ We consider the problem of finding the optimal set of source nodes in a diffusion network that maximizes the spread of information, in sequential fashion. It depends heavily on the underlying network parameters, which are not known to us initially. Estimation of these parameters is a difficult task when we don't have any observation available. We developed an online algorithm, where we observe cascades (infected nodes and corresponding timestamps) on the go and learn network parameters from the cascades seen so far, using an 'approximate' version of posterior probability matching, popularly known as Thompson Sampling. Though we were</p>

unable to obtain any theoretical regret bound, we observed no-regret performance of our algorithm on several datasets from the SNAP database.

B. A Game Theoretic Approach to Robust Optimization

- Robust Optimization is a framework in optimization under uncertainty, where a min-max problem is solved considering the worst possible realization of parameters, but it gets computationally intractable as the dimension of the problem increases. We developed a general framework for approximately solving a robust optimization problem using tools from online convex optimization and game theory, and provide a convergence analysis of the same

C. Multi-armed Bandits with Side Observations

- We Formulated personalized ad recommendation as a contextual bandit problem considering the underlying graph structure over items as well as over users, changing over time. We developed an UCB based approach in the case of side observations and proved a sub-linear regret guarantee for our algorithm.

COURSES	Stochastic Modeling and Applications, Linear Algebra, Real Analysis, Measure Theory, Linear and Non-linear Optimization, Design and Analysis of Algorithms, Machine Learning, Foundations of Data Science, Computer Vision, Game Theory, Online Prediction and Learning, Information Theory, Concentration Inequalities, Topics In Statistical Methods.	
TECHNICAL SKILLS	C, R, Python, MATLAB, \LaTeX .	
PROFESSIONAL SERVICES	<ul style="list-style-type: none"> □ PC member, All of Bayesian Nonparametrics workshop, NeurIPS, 2018. □ Teaching Assistant, Foundations of Machine Learning, Fall 2018. □ Reviewer, SPCOM 2016, IEEE-ANTS 2016. 	
ACADEMIC ACHIEVEMENTS	<ul style="list-style-type: none"> □ Recipient of Google India PhD Fellowship in Machine Learning, 2017. □ Participated in Google PhD Fellowship summit 2017, 2018. □ Participated in 5-th South Asia workshop on research frontiers in computing, NUS. □ Ranked 30 in All India GATE examination 2013. □ Ranked 184 in West Bengal Joint Entrance Examination, 2008 (Engineering). □ Ranked 20 in Secondary Examination 2006. 	
REFERENCES	<ol style="list-style-type: none"> 1. Dr. Aditya Gopalan, Professor, ECE, IISc. 2. Dr. Himanshu Tyagi, Professor, ECE, IISc. 3. Dr. Chiranjib Bhattacharyya, Professor, CSA, IISc. 	<div>aditya@iisc.ac.in</div> <div>htyagi@iisc.ac.in</div> <div>chiru@iisc.ac.in</div>