Aditya Modi

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Overview

My core area of research is reinforcement learning with focus on sample efficient methods. Broadly, I'm interested in developing methods with provable guarantees for sequential decision making frameworks like reinforcement learning, (contextual) bandits and general online learning.

Education

2016-Present **PhD, Computer Science**, *University of Michigan*, Ann Arbor.
Advisors: Satinder Singh and Ambuj Tewari

2012-2016 **Bachelor of Technology**, *Indian Institute of Technology*, Kanpur, *GPA − 9.4/10.0*.
Major: Computer Science

Publications/Preprints

Preprint **Meta-Reasoning in Modular Software Systems via Reinforcement Learning**.
A. Modi, D. Dey, A. Agarwal, A. Swaminathan, B. Nushi, S. Andrist, E. Horvitz   [Coming soon]
Under submission
Invited poster at *ICML 2019 Workshop on Reinforcement Learning for Real Life*

Arxiv **Contextual Decision Processes using Generalized Linear Models**.
Aditya Modi and Ambuj Tewari   [link]
Conference version under submission
Accepted at *ICML 2019 Workshop on Reinforcement Learning for Real Life*
Preliminary version accepted to *RLDM 2019, Montreal, Canada*

ALT 2018 **Markov Decision Processes with Continuous Side Information**.
Aditya Modi, Nan Jiang, Satinder Singh, Ambuj Tewari   [link]
International Conference on Algorithmic Learning Theory (ALT) 2018

Research Experience

July-Oct 2018 **Research Intern**, *Microsoft Research*, Redmond.
Optimizing modular software pipelines via Reinforcement Learning
Mentors: Debadeepta Dey, Adith Swaminathan, Alekh Agarwal, Eric Horvitz

The project investigates the application of contextual bandit, learning to search and policy search methods for input-adaptive parameter/algorithm selection across components in any modular software pipeline.

Sept-Dec 2016 **Research Assistant**, *University of Michigan*, Ann Arbor.
Data-dependent Importance weighted Active Learning
Advisors: Ambuj Tewari and Barzan Mozafari

Explored the domain of importance-weighted active learning (IWAL) algorithms based on data-dependent complexity measures for bounded loss functions.

May-July 2015	**Research Intern**, *Microsoft Research*, Bangalore, India.

Active Semi-supervised Performance Evaluation
Advisor: Sundararajan Sellamanickam, Principal Applied Scientist. [Report]

Proposed an estimation method for performance measures of black-box classifiers using scarcely labelled datasets for various non-decomposable performance measures (ROC curve, PR curve, F-measure).

Awards and Achievements

Feb 2018	Rackham Travel Grant (ALT/AISTATS 2018)
May 2016	Travel Scholarship for MLSS Cadiz, 2016.
2013, 2015	Academic Excellence Award, IIT Kanpur.
2014	Ram Parkash Chopra Memorial Scholarship, given for academic excellence, IIT Kanpur.
2013	OP Jindal Engineering and Management Scholarship (OPJEMS)
2012	Secured All India Rank 132 in IIT-JEE 2012 out of 0.5 million candidates.
2012	Secured All India Rank 150 in AIEEE 2012 out of 1.2 million candidates.

Talks/Invited Posters

June 2018	**Meta-Reasoning in Modular Software Systems via Reinforcement Learning**. Invited poster, ICML 2019 Workshop on Reinforcement Learning for Real Life
March 2019	**Contextual Decision Processes using Generalized Linear Models**. Speed Oral and poster, MSSISS 2019
March 2018	**Markov Decision Processes with Continuous Side Information**. Oral presentation, MSSISS 2018

Teaching experience

Winter 2017	**Graduate Student Instructor**, EECS 445 - Machine Learning, Univ. of Michigan.
Winter 2016	**Student Mentor**, CS 771 - Machine Learning Techniques, IIT Kanpur.
Fall 2015	**Teaching Assistant**, ESO 207 - Data Structures and Algorithms, IIT Kanpur.

Activities

Reviewer	AAAI 2019, AISTATS 2019, ICML 2019, NeurIPS 2019
2017, 2018	Co-organizer, Statistical Machine Learning Reading group, Univ. of Michigan.

Relevant Coursework

Theory	Advanced Algorithms, Computational Complexity, Algorithmic Game Theory, Approximation Algorithms
Statistics	Statistical Inference, Probability Theory, Large Sample Theory, Applied Probability and Stochastic Modeling.
Machine Learning/AI	Machine Learning Techniques, Learning with Kernels, Online Learning and Optimization, Probabilistic Machine Learning, Optimization Methods in Statistics, Advanced Artificial Intelligence, Applied Game Theory.