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

Working paper   **PREP: Credit Assignment without Exponentially Compounding Errors**.
Alekh Agarwal, Hal Daume III, John Langford, **Aditya Modi**, Amr Sharaf
*Alphabetical order.

Preprint   **Sample Complexity of Learning with Linearly Combined Model Ensembles**.
Aditya Modi, Nan Jiang, Ambuj Tewari, Satinder Singh   [link]
Under Submission

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

ICML 2019 Workshop, RLDM 2019   **Contextual Decision Processes using Generalized Linear Models**.
Aditya Modi and Ambuj Tewari   [link]
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

Studied the sample complexity 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

2019	NeurIPS 2019 best reviewer award.
2018, 2019	Rackham Travel Grant
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 2019 **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 2019-20, ICML 2019, NeurIPS 2019 (**Top reviewer**)
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.