

Aditya Modi

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, GPA – 3.9/4.0.
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

- 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. Our experiments cover a range of toy problems and a face detection pipeline in PSI.

- 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. We identified key issues in symmetrization and other approaches for the analysis of IWAL for hypothesis classes with bounded VC dimension. Our preliminary results for the generalization error and label complexity analysis were based upon a sample based cover argument motivated by the VE algorithm in contextual bandits literature.

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

2015 **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. Detailed experiments showed results and comparison for various non-decomposable performance measures (ROC curve, PR curve, F-measure) with varying proportion of labelled examples.

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.

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

2017, 2018 Co-organizer, Statistical Machine Learning Reading group, Univ. of Michigan.

Relevant Coursework

Theory Advanced Algorithms, Computational Complexity, Algorithmic Game Theory

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.