Aditya Kumar Akash

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Education

Sept 2018 - Present
MS *Computer Science*, University of Wisconsin, Madison
GPA : $4/4$

Aug 2016
Bachelors of Technology with Honors, *Computer Science and Engineering*, Indian Institute of Technology, Bombay, GPA : $9.18/10$

Work Experience

Summer 2020
Amazon *Applied Scientist Intern*
- Research done on out-of-distribution detection methods for computer vision

July 2016 - July 2018
Google, Maps Auto-Moderation Team *Software Engineer, Bangalore*
- Worked on auto-moderation system which is responsible for moderating millions of user generated edits on Google Maps and preventing spam and graffiti attacks
- Built user consensus and trust models for leveraging user votes to better decide the acceptance of edits on Maps
- Designed and launched the re-moderation system (internally) to clear backlog edits using new latest signals
- Improved the graffiti detection system by integrating news popularity of edited Maps features

Summer 2015
Microsoft, Bing Ads Team *Software Engineer-ML Intern, Bangalore*
- Worked on problem of predicting CTR (click through rate) for ads on Bing Search
- Designed metasearch based query-keyword relevance score combination system
- Implemented the solution on Microsoft's internal big data platform and showed promising gains in some markets

ML Publications

2020
Learning Invariant Representation using Inverse Contrastive Loss
Aditya Kumar Akash, Vishnu Suresh Lokhande, Sathya N. Ravi, Vikas Singh
Under Review [Abstract]

2020
FairALM: Augmented lagrangian method for training fair models with little regret
Vishnu Suresh Lokhande, Aditya Kumar Akash, Sathya N. Ravi, Vikas Singh
16th European Conference on Computer Vision (ECCV-20) [link]

2019
Stochastic bandits with delayed composite anonymous feedback
A. K. Akash, S. Garg, *NeurIPS 2019 Workshop on Machine Learning with Guarantees* [link]

Research Projects

Spring 2020
Learning Invariant Representation using Inverse Contrastive Loss (ICL)
Guide: Prof. Vikas Singh, [Abstract]
- Introduced ICL to learn learn representations invariant to an extraneous variable of interest
- Applications in learning unbiased representations and pooling multi-site data

Fall 2019
FairALM: Augmented lagrangian method for training fair models with little regret *Guide: Prof. Vikas Singh*, [paper]
- Joint work on imposing fairness constraints on deep models for computer vision
- The proposed augmented Lagrangian method leads to a stable and consistent enforcement of constraint which improves the interpretability of deep models

Fall 2021 **Model Fusion using Optimal Transport Framework**

Guide: Prof. Nicolas Garcia Trillos, Ongoing

- Working on a principled approach to combine multiple deep models using optimal transport
- Our proposed framework unifies the existing ad hoc methods and has applications in knowledge distillation and federated learning

Spring 2019 **Stochastic bandits with delayed composite anonymous feedback**

NeurIPS 2019 Workshop on Machine Learning with Guarantees [paper]

- Extended multi-armed bandits to a novel setting for real world scenarios like clinical trials with delayed and anonymous rewards and proposed phase based UCB algorithm

Other Research Projects

Fall 2019 **Improving Prediction Quality of Deep Autoregressive (AR) Models via Semi-Discrete Optimal Transport,** *Course Project*, [report]

- Integrated concepts from semi-discrete Optimal Transport (OT) with deep AR models to improve the quality of generated images

Spring 2019 **Reducing Inconsistency in Video Segmentation using Learned Regularizers**

Midwest Machine Learning Symposium (MMLS), 2019 [report]

- Proposed learning consistency based regularizers from data to reduce inconsistency in video segmentation and designed Segnet based architecture for the same

Autumn 2015 - Spring 2016 **Consensus-based Active Learning Strategy for Multi-Label Classification**

Undergraduate Dissertation, IIT Bombay, Guide: Prof. Ganesh Ramakrishnan

- Worked on problem of multilabel classification for predicting video tags
- Designed an active learning based strategy that optimizes the cost of labeling, labeler reliability and inter-labeler consensus [report part1][part2] [relevant publication]

Summer 2014 **Local counter-based policies for robot patrolling**

Research Intern, Technische Universität, Braunschweig, Guide: Prof. Sándor P. Fekete

- Worked on theoretical aspects of swarm of mobile robots exploring an arbitrary graph and established a new lower bound on Least-Recently-Visited policy [paper1][paper2]

Academics

Graduate Courses: Mathematical Foundation of ML, Big Data Systems, Modern Data Management and ML Systems, Deep Learning, Optimal Transport, Non-linear Optimization, Advanced Algorithms

Skills: C, C++, Java, Python, MATLAB, Pytorch, TensorFlow

Other Publications

2016 **Lower bounds for graph exploration using local policies**

A. K. Akash, S. P. Fekete, S.K. Lee, A.Lpez-Ortiz, D. Maftuleac, and J. McLurkin

10th International Workshop on Algorithms and Computations (WALCOM) [link]

2015 **Local policies for efficiently patrolling a triangulated region by a robot swarm**

D. Maftuleac, S.K. Lee, S. P. Fekete, A. K. Akash, A.López-Ortiz, and J. McLurkin

IEEE International Conference on Robotics and Automation (ICRA) [link]

Miscellaneous

2019, 2018 **Teaching Assistant** for Algorithms (CS577), Data structures (CS400), UW Madison

2017 Co-hosted intern at Google

2016 Winners in **ACM ICPC** Chennai regionals, **qualified for World Finals**

2013 **Invited by HRD Ministry**, Government of India, to witness Republic Day parade from Prime Minister's box, for academic excellence in senior secondary school

2012 **All India Rank 38** in *IIT JEE*, among 500,000 candidates

2012 **All India Rank 50** in *AIEEE*, among 1.5 million candidates