Aditya Deshmukh

Contact Information

Emails: ad11@illinois.edu || aditya.deshmukh78@gmail.com
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Research Interests

Statistical Inference, Machine Learning, Reinforcement Learning, Data Compression, Optimization & Information Theory

Education

University of Illinois at Urbana-Champaign (UIUC) Aug 2017 – Dec 2023
Ph.D. in Electrical and Computer Engineering 3.97/4.0
- Advisor: Venugopal Veeravalli
- Thesis Committee: Venugopal Veeravalli, Maxim Raginsky, Pierre Moulin, Georgios Fellouris

Indian Institute of Technology Madras (IIT Madras) 2012 – 2017
B.Tech. and M.Tech. in Electrical Engineering 8.81/10.0
- Advisor: Srikrishna Bhashyam

Professional Experience

Amazon Inc.
Remote – Research Scientist Intern May - Aug 2021
- Identified relevant features and implemented machine learning models for the problem of online defect identification to improve output of Alexa's NLP model

Tata Institute of Fundamental Research (TIFR)
Mumbai – Junior Research Fellow May – July 2015
- Conducted research under the guidance of Rahul Vaze on the problem of online energy-efficient packet scheduling

Phasorz Technologies
Chennai – Android Development Intern March – July 2014
- Developed 'DocsApp' (now MediBuddy) - an android based messaging and consulting platform for patients and doctors

Fellowships & Achievements

- Mavis Future Faculty Fellowship (conferred by UIUC) 2021
- Joan and Lalit Bahl Fellowship (conferred by UIUC) 2021,2022
- Dr. Ok Kyun Kim Fellowship (conferred by UIUC) 2019
- All India Rank 599 in IIT-JEE among half million applicants 2012
- Selected for KVPY Scholarship (SX Stream) by IISc 2011

Journal Publications & Preprints

- Distributed and Adaptive Feature Compression using VQ-VAEs
  A. Deshmukh, V. Veeravalli, and G. Verma
  under preparation

- Robust Mean Estimation in High Dimensions: An Outlier Fraction Agnostic and Efficient Algorithm
  A. Deshmukh, J. Liu, and V. Veeravalli [arXiv]
  IEEE Transactions on Information Theory (2023)

- Information Flow Optimization for Estimation in Linear Models Using a Sensor Network
  A. Deshmukh, J. Liu, V. Veeravalli, and G. Verma [IEEE Xplore]
  IEEE Signal Processing Letters (2023)

- Sequential controlled sensing for composite multihypothesis testing
  A. Deshmukh, S. Bhashyam, and V. Veeravalli [arXiv]
  Sequential Analysis (2021)

- Online Energy-Efficient Packet Scheduling for a Common Deadline With and Without Energy Harvesting
  A. Deshmukh and R. Vaze [arXiv]
  IEEE Journal on Selected Areas in Communications (2016)

Conference Proceedings

- Robust High-Dimensional Linear Discriminant Analysis under Training Data Contamination
  Y. Shi, **A. Deshmukh**, Y. Mei, and V. Veeravalli [IEEE Xplore]
  IEEE International Symposium on Information Theory (ISIT 2023)

- Robust Mean Estimation in High Dimensions: An Outlier Fraction Agnostic and Efficient Algorithm
  A. Deshmukh, J. Liu and V. Veeravalli [IEEE Xplore]
  IEEE Int. Symposium on Information Theory (ISIT 2022)

- High-dimensional robust mean estimation via outlier-sparsity minimization
  A. Deshmukh, J. Liu, and V. Veeravalli [IEEE Xplore]
  55th Asilomar Conference on Signals, Systems, and Computers (Asilomar 2021)

- Information Flow Maximization in Inference Networks
  A. Deshmukh, J. Liu, and V. Veeravalli [arXiv]
  IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP 2020)

- Controlled Sensing for Composite Multihypothesis Testing with Application to Anomaly Detection
  A. Deshmukh, S. Bhashyam, and V. Veeravalli [IEEE Xplore]
  52th Asilomar Conference on Signals, Systems, and Computers (Asilomar 2018)

- Online energy efficient packet scheduling with a common deadline
  A. Deshmukh and R. Vaze [IEEE Xplore]
  International Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks (WiOpt 2016)

Teaching & Mentoring Experience

Teaching Assistant

6 semesters at UIUC and 2 semesters at IIT Madras

- UIUC: Data Science and Engineering (ECE365), Introduction to Optimization (ECE490), Statistical Inference for Engineers and Data Scientists (ECE561), Computational Inference (ECE566)
- IIT Madras: Communication Systems (EE3005), Communication Networks (EE5150)

Undergraduate Mentor

- Naman Raina: 'Robust Estimation'
- Kevin Zhang: 'Distributed Feature Compression'

Professional Service

Reviewer

- Conferences: ISIT (2019, 2022, 2024)
- Journals: IEEE Transactions on Signal Processing (2020, 2021), IEEE Transactions on Information Theory (2020, 2022)

Programming Skills

Python (including PyTorch, scikit-learn), C, Java, MATLAB