

## EDUCATION

**GEORGIA INSTITUTE OF TECHNOLOGY** PH.D. IN COMPUTER SCIENCE | 2017 - Dec 2022 (Expected)  
Atlanta, Georgia; Advisors: Dr. Jacob Abernethy and Dr. Jamie Morgenstern **GPA: 4.0/4.0**

**GEORGIA INSTITUTE OF TECHNOLOGY** M.S. IN COMPUTER SCIENCE | 2017 - 2020  
Atlanta, Georgia; Specialization in Machine Learning **GPA: 4.0/4.0**

**IIT KANPUR** B.TECH IN COMPUTER SCIENCE AND ENGINEERING | 2013 - 2017  
Kanpur, India **GPA: 9.7/10**

**Research Interests:** Fairness and transparency in A.I., mechanism design, online learning, deep learning, privacy preserving A.I.

## PUBLICATIONS

- [1] **ActiveHedge: Hedge meets Active Learning** with Jacob Abernethy and Venkatesh Saligrama  
*International Conference on Machine Learning (ICML) 2022 (Spotlight)*  
- Also selected as oral talk at Complex Feedback in Online Learning Workshop, ICML 2022  
- Also presented at Adaptive Experimental Design and Active Learning in the Real World Workshop, ICML 2022
- [2] **Observation Free Attacks on Stochastic Bandits** with Yinglun Xu and Jacob Abernethy  
*Neural Information Processing Systems (NeurIPS), 2021*
- [3] **Optimal Spend Rate Estimation and Pacing for Ad Campaigns with Budgets** with Jamie Morgenstern, and Okke Schrijvers  
*Talk at INFORMS Annual Meeting 2021*
- [4] **Learning Auctions with Robust Incentive Guarantees** with Jacob Abernethy, Rachel Cummings, Jamie Morgenstern, Samuel Taggart  
*Neural Information Processing Systems (NeurIPS), 2019*  
- Preliminary version presented at Learning in Presence of Strategic Behavior Workshop, EC 2019
- [5] **Bridging Truthfulness and Corruption-robustness in Multi-Armed Bandit Mechanisms** with Jacob Abernethy, Thodoris Lykouris, and Yinglun Xu  
*Incentives in Machine Learning Workshop, ICML 2020*
- [6] **Accelerated Federated Optimization with Quantization** with Yeojoon Youn and Jacob Abernethy. *Under review*
- [7] **Accelerated Parallelizable Projection-Free Algorithm for the Nuclear-Norm Ball Constraint** with Jun-Kun Wang, and Jacob Abernethy. *Preprint*

## WORK EXPERIENCE

**AMAZON** APPLIED SCIENTIST INTERN | MAY 2021 - AUG 2021

- Worked on **fairness and transparency in machine learning** with Prof. Michael Kearns and Dr. Matthäus Kleindessner.
- Introduced a **new notion for group fairness** in multi arm bandits and designed a no-regret algorithm.

**UNIVERSITY OF WASHINGTON** RESEARCH SCIENTIST | JAN 2021 - APRIL 2021

- Worked on **designing simple and incentive compatible auctions** for revenue maximization in repeated auctions.

**FACEBOOK** RESEARCH INTERN | MAY 2020 - NOV 2020

- Part of the **Economics, Algorithms, and Optimization research** team in Core Data Science.
- Developed algorithms for **optimal spend plan prediction** and **automatic bid pacing** for budget constraint ad campaigns.

**FACEBOOK** SOFTWARE ENGINEERING ML INTERN | MAY 2019 - JUL 2019

- Optimized for Return on Ad Spend for **ads ranking** and products ranking in Dynamic Product Ads using **deep learning**.
- Introduced a new deep learning architecture and **increased ad revenue while saving 60 TB memory usage (86 % decrease)**.

**NORTHWESTERN UNIVERSITY** VISITING GRADUATE STUDENT | MAY 2018 - JUNE 2018

- Analyzed a regularized variant of the maximum likelihood approach for **approximating graphical spin models (Ising model)**.

**JOHNS HOPKINS UNIVERSITY** RESEARCH INTERN | MAY 2016 - AUG 2016

- Worked on **stochastic methods for Kernel PCA** by extending Stochastic PCA methods using non linear feature maps.

**NIKE** SOFTWARE ENGINEERING INTERN | MAY 2015 - JUNE 2015

- Developed a **website, ticketing, and check-in system** for a Nike event attended by over a 1000 guests.

## AWARDS

- Awarded **Chair's fellowship** by The School of CS, Georgia Tech.
- **Academic Excellence Award**, IIT Kanpur 14',15',16' (Dean's List)
- Secured **All India Rank 269** in JEE Advanced and **All India Rank 321** in JEE Mains, 2013 among the 1.65 million candidates.
- Awarded the **KVPY fellowship 2011** and **NTSE scholarship 2009** by the Govt. of India.
- Cleared the **Mathematics, Informatics, Physics, and Astronomy** Olympiads organised by the Govt. of India.

## TEACHING ASSISTANT

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|--|--------------|----------------------|
| • <b>Machine Learning for Trading</b> (CS7646) | Georgia Tech | Spring 22, Summer 22 |
| • <b>Machine Learning Theory</b> (CS7545)      | Georgia Tech | Fall 19, Fall 18     |
| • <b>Introduction to Computing</b> (ESC101)    | IIT Kanpur   | Spring 17, Fall 16   |

## OTHER RESEARCH EXPERIENCE

### ACTION RECOGNITION IN VIDEOS

DR. GAURAV SHARMA, IITK | 2017

- Used **deep learning** with trajectory pooled features for **action recognition in videos** and achieved state of the art results.
- Implemented alternating minimization for homography estimation to **speed up train and test time by 50%**.

### ROBUST PCA

DR. P. KAR, IITK AND DR. PRATEEK JAIN, MICROSOFT RESEARCH | 2016

- Solved non-convex Robust PCA for **background subtraction** in surveillance **videos with moving cameras**.
- Extended methods for still camera to camera motion by devising fast methods for homography estimation.

### OBJECT AND FACE RECOGNITION IN VIDEOS

DR. H. KARNICK, IITK | 2016

- Developed methods for **object recognition** for traffic surveillance from traffic camera videos using **deep learning**.

## LEADERSHIP / SERVICE

- **Conference reviewer for:** NeurIPS, ICML, COLT, ALT, EC, SODA, JMLR
- **Vice President | SCS Graduate Student Association, GaTech:** Founding vice-president of the newly formed School of Computer Science Graduate Student Association for the 2021-2022 academic year.
- **Faculty hiring student nominee | School of Computer Science, GaTech:** Student representative in faculty meetings for faculty hiring. Organized students-candidate meetings and presented student body's feedback for faculty hiring decisions.
- **Co-organizer | ACO Student seminar, GaTech:** Organized weekly Algorithms, Combinatorics, Optimization, and Machine Learning seminars.
- **Co-organizer | CoC Happy Hour, GaTech:** Organized weekly social gathering for the grad students of the college.
- **Coordinator | Programming Club, IITK:** Organized various programming contests, hackathons, summer projects, programming workshops and events for the community while managing a team of over 15 secretaries.
- **Group Leader | Science Coffeeshouse, IITK:** Organized regular meets, contests and managed the administrative tasks for the Science discussion group at IITK.

## SELECT PROJECTS

- **photoCENTER - Image/Video Processing App:** Developed an open-source multi-platform software to edit videos and images including background extraction capabilities using computer vision techniques.
- **Artify:** Designed a web app in Django for deep neural style transfer written in Tensorflow creating artistic images.
- **ColourIT:** Developed a learning algorithm to automatically colour a grayscale image deep learning.
- **Research Group Website** Designed a package to manage a research group's website using Node.js.

## SKILLS

### Languages

**Expert:** C++ • Python • C  
**Proficient:** Matlab • Octave

### Scientific Libraries

Tensorflow • Keras • PyTorch  
• SKlearn • OpenCV • pandas

### General Tools

MySQL • Presto • OpenGL  
• Latex • Git

### Webdev

Node.js • web.py • Django  
• Javascript • HTML • CSS