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## EDUCATION

**Georgia Tech** | Ph.D. in Computer Science - Interests: Machine Learning, Mechanism Design, Differential Privacy
Aug 2017 - May 2022 (Expected) | Advisors: Dr. Jacob Abernethy and Dr. Jamie Morgenstern | **GPA: 4.0/4.0**

**IIT Kanpur** | B.Tech in Computer Science and Engineering
Aug 2013- May 2017 | Kanpur, India | **GPA: 9.7/10**

## PUBLICATIONS

(* Corresponding Author)

[1] **Learning Auctions with Robust Incentive Guarantees**. Jacob Abernethy, Rachel Cummings, Bhuvesh Kumar*, Jamie Morgenstern, Samuel Taggart. **NeurIPS, 2019.**
Preliminary version presented at Learning in Presence of Strategic Behavior, **EC 2019.**

[2] **Non-Stochastic Active Learning with Expert Advice.** Bhuvesh Kumar*, Jacob Abernethy, Venkatesh Saligrama. Preprint.

## INTERNSHIP EXPERIENCE

**Machine Learning PhD Intern** | Facebook
May 2019 – July 2019 | Menlo Park, CA

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

**Visiting Graduate Student** | Northwestern University
May 2018 – Aug 2018 | Evanston, IL

- Worked on estimating graphical models
- Analyzed a regularized variant of the maximum likelihood approach for the problem of approximating Ising distributions in the high-temperature regime.

**Research Intern** | Johns Hopkins University
May 2016 – Aug 2016 | Baltimore, MD

- Worked on stochastic methods for Kernel PCA by extending Stochastic PCA methods using non linear feature maps.
- Used Randomized Fourier features and deterministic features using Taylor series to approximate the kernel evaluation.

## OTHER RESEARCH EXPERIENCE

**Auction Design using Differential Privacy** | Graduate Research, Georgia Tech
Jan 2018 – Present

- Using differential privacy to design incentive compatible online actions with revenue maximization.
- Proved regret like gurantees for non-myopic bidders using techniques from mechanism design, online learning, and differential privacy.

**Learning Ising Models Privately** | Georgia Tech
Oct 2019 – Present

- Using a differentially private multiplicative weight method to learn Ising distributions privately.

**Non Convex Methods for Surveillance** | Dr. Prateek Jain, Microsoft Research and Dr. Purushottam Kar, IITK
Aug 2016 – December 2016

- Used alternating minimization technique to solve the non-convex Robust PCA objective for background subtraction.
- Extended the Robust PCA for still camera videos to videos with camera motion by devising fast methods for homography estimation.

**Extreme Multiclassification** | Dr. Prateek Jain, Microsoft Research and Dr. Purushottam Kar, IITK
Jan 2016 – April 2016

- Worked on developing a scalable algorithm for extreme multiclass-classification problems.
- Extended the SLEEC algorithm which is a local embedding based algorithm for extreme multi labelling objectives to extreme multiclass settings.

## TEACHING

- **TA :** Machine Learning Theory, GaTech (Fall 18, Fall 19) ; ESC101, IIT Kanpur (Fall 16, Spring 17)

## LEADERSHIP / SERVICE

- **Conference reviewer/sub-reviewer for:** ALT 2020, EC 2019, ALT 2018
- **Faculty hiring student nominee | SCS, GaTech:** Organize student meetings and lunches with the faculty candidates in the department and be the student representative in the committee.
- **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:** Organised various programming contests, Hackathons, summer projects, programming workshops and events for the campus community while managing a team of over 15 secretaries.
- **Group Leader| Science Coffeehouse, 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 Caffe.
- **ColourIT:** Developed a learning algorithm to automatically colour a grayscale image using multiple regressors and deep learning.
- **Research Group Website** Designed a package to manage a research group's website by implementing self populating project pages, group members, publications, news, and collaborators using MEAN stack.

## 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.

## SKILLS

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

**Scientific Libraries**
Tensorflow • SKlearn • PyTorch • Caffe • OpenCV • pandas

**General Tools**
Git • LaTeX • GNUplot • vim • MySQL • Presto • OpenGL

**Webdev**
Node.js • web.py • Django • PHP • Javascript • HTML • CSS