

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

(Author names in alphabetical order)

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

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.

Software Engineering Intern | NIKE
May 2015 - June 2015 | Dubai, UAE

- Developed and deployed a ticketing system using Amazon AWS for a Nike event attended by over a 1000 guests.
- Made an android app and set up an SQL server to check in guests for the event based on the unique QR codes.
- Developed a website for the same event integrating social tagging in 360 panoramas.
- Facebook Graph API, email addresses, and the Twitter APIs were used to fetch data, perform tagging, and sharing.

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 guarantees for non-myopic bidders using techniques from mechanism design, online learning, and differential privacy.

Action Recognition in Videos | DR. GAURAV SHARMA, IITK
Aug 2016 – May 2017

- Used deep learning combined 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%.

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
- **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