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EDUCATION

Georgia Tech | Ph.D. in Computer Science - Interests: Machine Learning, Optimization, Deep Learning
Aug 2017 - May 2021 (Projected) | Advisor: Dr. Jacob Abernethy | **Cumm. Grade Point: 4.0/4.0**

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

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.

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.

Automatic Video Surveillance | Dr. H. Karnick, IITK
Jan 2016 – April 2016
- Developed methods for entity recognition for traffic surveillance from traffic camera videos using deep learning.
- Implemented Entity recognition using CRFs and RCNN, and face detection and recognition using Viola-Jones and deep nets.

PUBLICATIONS

[1] **Privacy, Overfitting, and Truthfulness in Auctions**. Bhuvesh Kumar, Jacob Abernethy, Rachel Cummings, Jamie Morgenstern, Samuel Taggart. Under submission, 2018

INTERNSHIP EXPERIENCE

Research Intern | Johns Hopkins University
May 2016 – Aug 2016 | Baltimore, USA
- 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.

Software Engineering Intern | Bank Muscat
June 2015 - July 2015| Dubai, UAE
- Developed an app using Microsoft Kinect implementing background subtraction, gesture recognition, face recognition and detection.
- Designed a multi-screen setup for deploying the app as a marketing and advertisement tool at public places.

TEACHING AND LEADERSHIP

- **TA | Machine Learning Theory, GaTech (Fall 18):** Design and grade homeworks and exams, hold office hours, deliver lectures.
- **Tutor | ESC101, IIT Kanpur (Fall 16, Spring 17):** Delivered weekly tutorials, supervised the TAs, set exams and lab sessions.
- **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.

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 • scikit-learn • Caffe • PyTorch • OpenCV • pandas

General Tools
Git • LaTeX • GNUplot • vim • MySQL • MongoDB • OpenGL

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