

Avinandan Bose

SOPHOMORE UNDERGRADUATE · INDIAN INSTITUTE OF TECHNOLOGY KANPUR

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Education

Indian Institute of Technology Kanpur

BACHELOR OF TECHNOLOGY IN COMPUTER SCIENCE AND ENGINEERING

- Cumulative Performance Index(CGPA): **9.32/10.0**

Kanpur, Uttar Pradesh

July, 2018 - PRESENT

South Point High School

HIGH SCHOOL, 12TH GRADE

- Central Board Of Secondary Education, CBSE: **95%**

Kolkata, West Bengal

May 2008 - Apr 2018

Experience

Bayesian Tensor Completion for Traffic Estimation

UNDERGRADUATE RESEARCH PROJECT UNDER PROF. KETAN RAJAWAT

Dept of Electrical Engineering, IITK

Aug. 2019 - PRESENT

- Studied and understood paper on Variational Bayesian Inference for Robust Streaming Tensor Factorization and Completion by Cole Hawkins and Zheng Zhang
- Studied and understood Tensor Algebra, Low rank Tensor Factorization
- Studied and understood paper on Traffic Estimation via Online Variational Bayesian Subspace Filtering by Ketan Rajawat
- Project currently in initial stage. Currently working on deriving the tensor extension to the existing traffic estimation problem using matrix completion, and methods to reduce time complexity of computations

Probabilistic Machine Learning and Applications

SUMMER PROJECT [CODE][REPORT]

Programming Club, IITK

May, 2019 - Jul. 2019

- Studied and understood preliminaries of Bayesian Inference, Non-Conjugacy and Conditional Conjugacy, Linear Models and Exponential Families, Latent Variable Models, Expectation Maximization Algorithm, Variational Inference and Markov Chain Monte Carlo
- Implemented model in NumPy for density estimation using Gaussian Mixture Models on MNIST dataset
- Built a Recommender System using Bayesian Matrix Factorisation and studied and understood Poisson Matrix Factorisation
- Built a Variational Autoencoder model on PyTorch to learn a low dimensional representation for handwritten digits

Generative Adversarial Networks

SEMESTER LONG PROJECT [CODE]

Association of Computing

Activities, IITK

Jan. 2019 - Apr. 2019

- Implemented Deep Residual Nets for Image Recognition using skip connections between layers and studied the improvement in results without skip connections
- Learned the basics of Autoencoders and Generative Adversarial Networks, ideas of Distribution Matching, Minimax Games and Divergence Minimization via Adversarial Learning
- Implemented models such as Minimax GAN, LSGAN, Wasserstein GAN. Used evaluation metrics such as Inception Score and Frechet Inception Distance in PyTorch and TorchGAN

Algorithms in Depth

SUMMER PROJECT [CODE]

Programming Club, IITK

May. 2019 - Jul. 2019

- Studied and understood Graph Traversal Methods such as BFS, DFS, Dijkstra and Kruskal
- Studied and understood topics on Game Theory such as Game of Nim and Grundy numbers
- Explored and implemented KMP, Huffman Coding and Disjoint Set Union

Centralized Inventory and Purchasing

SUMMER INTERN PROJECT

Dept. of CSE, IITK

May. 2019 - Jul. 2019

- Developed a web app for efficient inventory management across various departments of the NGO Vitraag Vigyaan by facilitating transfers and managing purchase tenders.
- Technologies used: NodeJS, MongoDB, ReactJS

Honors & Awards

2019	Academic Excellence Award , Awarded to top 5 percent freshmen based on Academic performance	IIT KANPUR
2018	CLASS OF 1990 SCHOLARSHIPS , awarded to top three rankers of institute	IIT KANPUR
2018	All India Rank 104 , Joint Entrance Examination Advanced 200,000 candidates	India
2018	All India Rank 554 , Joint Entrance Examination Main 1.5 million candidates	India
2017	All India Rank 68 , KVPY Scholarship Indian Institute of Science and Government of India	Bangalore,India
2018	All India Rank 1 , West Bengal Joint Entrance Examination	West Bengal,India
2018	Gold Medal , Indian National Physics Olympiad	Mumbai,India
2015	Gold Medal , Indian National Junior Science Olympiad	Mumbai,India
2017	3rd in State, National Top 1 % , National Standard Examination in Physics	India
2017	3rd in State, National Top 1 % , National Standard Examination in Chemistry	India
2017	2nd in State, National Top 1 % , National Standard Examination in Astronomy	India
2016	3rd in State, National Top 1 % , National Standard Examination in Astronomy	India
2016	State Top 1 % , National Standard Examination in Physics	India
2014	State Top 1 % , National Standard Examination in Junior Science	India
2016	Scholar , National Talent Search Examination	India

Skills

Languages	Proficient : C,C++, Python Familiar : Javascript
Deep Learning Frameworks	PyTorch
Data Science Libraries	NumPy,SciPy,Pandas,Scikit-Learn
Operating Systems	Windows,Ubuntu
Utilities	Linux Shell Utilities,Git,L ^A T _E X
Development	Familiar:Node.js,React,MongoDB

Course Work

Real Analysis and Multivariable Calculus A*	Fundamentals of Programming A*
Linear Algebra and Ordinary Differential Equations	Data Structures and Algorithms ⁱ
Discrete Mathematics for Computer Science ⁱ	Introduction to Machine Learning [@]

i : in progress

@ : audit

A : Grade for exceptional performance*

Positions of Responsibility

Programming Club IIT KANPUR

Kanpur,India

SECRETARY

Mar. 2019 - PRESENT

- Responsible for conducting contests and activities for campus community and conducting lectures and workshops on various topics for interested students

Special Interest Group in Machine Learning(SIGML) IIT KANPUR

Kanpur,India

SECRETARY

Sept. 2019 - PRESENT

- Responsible for delivering and conducting talks for presenting papers, the speaker's research work, and lectures on specialized subfields of Machine Learning
- Responsible for conducting sessions aimed at Student and Faculty Researchers in Machine Learning for discussion of their current research problems and cross-pollination of ideas and insights