Avinandan **Bose**

SOPHOMORE UNDERGRADUATE · INDIAN INSTITUTE OF TECHNOLOGY KANPUR

Kanpur,Uttar Pradesh,India

(+91) 62-9066-5147 | avibose@iitk.ac.in | avinandan22.github.io | Avinandan22 | avinandan-bose-9114b5176

Education

Indian Institute of Technology Kanpur

Kanpur,Uttar Pradesh

Bachelor of Technology in Computer Science and Engineering

July. 2018 - PRESENT

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

South Point High School

Kolkata,West Bengal

High School,12th Grade

May 2008 - Apr 2018

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

Experience

Bayesian Tensor Completion for Traffic Estimation

Dept of Electrical Engineering,IITK

Undergraduate Research Project under Prof.Ketan Rajawat[REPORT]

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
- Extended the findings in the above two papers by deriving an expression such that Tensor Factorization and Completion follows first order auto regressive model for its temporal component.
- Currently implementing the proposed model in MATLAB.

Probabilistic Machine Learning and Applications

Programming Club,IITK

Summer Project [CODE][REPORT]

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

Association of Computing Activities,IITK

Semester Long Project[CODE]

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

Programming Club,IITK

Summer Project[CODE]

May. 2019 - Jul. 2019

- Studied and understood Graph Traversal Methods such as BFS,DFS,Djikstra and Kruskal
- Studeied 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

Dept. of CSE,IITK

Summer Intern Project

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.
- Technolgies 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,LaTeX.MATLAB
Development	Familiar:Node.js,React,MongoDB

Course Work

Real Analysis and Multivariable Calculus A*
Linear Algebra and Ordinary Differential Equations
Discrete Mathematics for Computer Science^{i}
Convex Optimization in Signal Processing and Communication^{n}
Computer Organization^{n}
Logic and Probability for Computer Science^{n}
Fundamentals of Programming A*
Data Structures and Algorithms^{i}
Introduction to Machine Learning$^{@}$
Introduction to Bayesian Analysis^{n}
Software Development and Operations^{n}

i : in progress
A : Grade for exceptional performance*
@ : audit
n : Registered for upcoming semester (Jan20 - Apr20)

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 subfileds 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