Spandan **Senapati**

SOPHOMORE UNDERGRAUDATE · COMPUTER SCIENCE AND ENGINEERING

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Education

Indian Institute Of Technology Kanpur

Kanpur, Uttar Pradesh

BACHELOR OF TECHNOLOGY IN COMPUTER SCIENCE AND ENGINEERING

July 2018 - Present

- Cumulative Performance Index (CGPA) : 9.47/10.0

DAV PUBLIC SCHOOL

Bhubaneswar, India

HIGH SCHOOL, 12TH GRADE

Aug 2012 - Apr 2018

- Central Board of Secondary Education (CBSE) : 95.4 %

Work Experience

Bayesian Tensor Completion for Traffic Estimation

Dept. of Electrical Engineering, IIT K

UNDERGRADUATE RESEARCH PROJECT UNDER DR. KETAN REJAWAT, IIT KANPUR[**REPORT**]

Aug 2019. - Present

- Read and understood a paper by Cole Hawkins and Zheng Zhang on Tensor Decomposition using Variational Inference
- Explored Tensor Algebra, Low Rank Decomposition, CP Decomposition, Khatri Rao Product etc.
- Studied and understood paper on Traffic Estimation via Online Variational Bayesian Subspace Filtering by Ketan Rajawat.
- Project currently in final stage. Currently working on training using a traffic data set in MATLAB framework and accuracy of the process and methods to reduce time complexity of matrix inversions via LDL Decomposition.

Probabilistic Machine Learning

Programming Club, IIT K

SUMMER PROJECT

May. 2019 - July. 2019

- Explored aspects of Bayesian Machine Learning i.e Expectation Maximization, Stepwise and Incremental EM, Variational Inference, Gibbs Sampling, Markov Chain Monte Carlo Stimulation, Conjugacy etc.
- Read and understood a paper on Stochastic Variational Inference by Matthew D. Hoffman, David M. Blei, Chong Wang and John Paisley.
- Implemented a numpy based model for density estimation usig Gaussian Mixture Models on MNIST dataset.
- Explored other advances in Variational Inference i.e Black Box VI, Amortized VI etc. through research papers.

Algorithms in Depth

Programming Club, IIT K

SUMMER PROJECT

May. 2019 - July. 2019

- Understood and implemented graph algorithms such as BFS, DFS, Dijkstra, Kruskal etc.
- Studied Sprague-Grundy Theorem, Grundy Numbers, Game of Nim etc.
- Studied and implemented Knuth-Morris-Pratt(KMP) Algorithm, Huffman Coding, Disjoint set union etc.

Atari Games using Reinforcement Learning

Association of Computing Activities, IIT K

SEMESTER LONG PROJECT

Feb. 2019 - Mar. 2019

- Studied and understood basics of Reinforcement Learning such as Markov Decision Processes, Model Free Prediction, Model-Free Control, Value Function Approximation, Policy Gradient Methods etc
- Studied and understood how Reinforcement Learning is applied in training Atari Games.

Honors & Awards

2018	**All India Rank 161**, JEE Main Examination	*India*
2018	**All India Rank 191**, JEE Advanced Examination	*India*
2017	**All India Rank 24**, KVPY Scholarship, Indian Institute Of Science and Government of India	*Bangalore, India*
2016	**NTSE Scholar**, Government of India	*India*
2019	**Academic Excellence Award**, Awarded to top 5% freshmen based on academic performance	*IIT Kanpur, India*
2016	**Gold Medal, National Top 35**, Indian National Junior Science Olympiad(INJSO)	*India*
2018	**National Top 1%** , National Standard Examination in Physics(NSEP)	*India*
2017	**National Top 1%** , National Standard Examination in Physics(NSEP)	*India*
2018	**National Top 1%** , National Standard Examination in Chemistry(NSEC)	*India*
2018	**State Top 1%** , National Standard Examination in Astronomy(NSEA)	*Odisha, India*
2018	**State Top 1%** , National Standard Examination in Astronomy(NSEA)	*Odisha, India*
2015	**State Top 1%** , National Standard Examination in Junior Science(NSEJS)	*Odisha, India*
2017	**State Rank 3**, Regional Mathematics Olympiad(RMO)	*Odisha, India*
2016	**State Top 35**, Regional Mathematics Olympiad(RMO)	*Odisha, India*

Skills

Languages	Python, C, C++, LaTeX, Octave, Matlab
Deep Learning Frameworks	Pytorch
Deep Learning Libraries	Numpy, Pandas, Scipy
Operating Systems	Windows, Ubuntu
Utilities	Linux Shell, Git,LaTeX

Relevant Coursework

Real Analysis and Multivariable Calculus A*
Linear Algebra and Ordinary Differential Equations A
Discrete Mathematics for Computer Science^{i}
Introduction to Machine Learning^{N}
Software Development and Operations^{N}
Fundamentals of Programming A
Data Structures and Algorithms^{i}
Set Theory and Logic, Probability Theory^{N}
Convex Optimisation in Signal Processing and Communication^{N}
Computer Organisation^{N}

i : in progress
A : Grade for exceptional performance*
N : To be done in the upcoming semester

Positions of Responsibility

Special Interest Group in Machine Learning(SIGML) IIT Kanpur *Kanpur, India*

Secretary *Sep. 2019 - PRESENT*

- Responsible for delivering and conducting talks for presenentation of papers, research work of the speaker etc. on differnt fields 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.