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	*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*

Fundamentals of Programming A

Linear Algebra and Ordinary Differential Equations

Data Structures and Algorithms[i]

Discrete Mathematics for Computer Science[i]

i : in progress

A : Grade for exceptional performance*

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.