

# SPANDAN SENAPATI

Junior Year Undergraduate  
Computer Science and Engineering

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## Academic Qualifications

Year	Degree/Certificate	Institute	CPI/%
2018 - Present	B.Tech in Computer Science and Engineering	Indian Institute of Technology, Kanpur	<b>9.32/10</b>
2018	Class XII (CBSE)	DAV Public School, Chandrasekharpur(BBSR)	95.4%
2016	Class X (CBSE)	DAV Public School, Chandrasekharpur(BBSR)	10/10

## Academic Achievements

- Secured **All India Rank 161** in **JEE Mains** 2018 among 1.5 million candidates
- Secured **All India Rank 191** in **JEE Advanced** 2018 among 150,000 shortlisted candidates
- Selected for **KVPY** 2016 fellowship, securing **AIR 24** among 50,000 candidates conducted by IISc Bangalore
- Awarded **National Talent Search Scholarship** 2016 by NCERT (National Council of Educational Research and Training)
- Awarded **Academic Excellence Award** for the years 2018-19, 2019-20 by IIT Kanpur for excellent academic performance
- Among the **National top-35** selected for the **OCSC** of **IJSO** 2016, (Bali, Indonesia) out of about 45,000 candidates
- Qualified for **INMO** in 2016 & 2017, **INPHO** and **INAO** in 2017 & 2018 and **INCHO** in 2018 conducted by HBCSE, Mumbai
- **National Top 1%** in **NSEP** 2017 organised by Indian Association of Physics Teachers (IAPT) among 45,000 candidates

## Projects

- **Bayesian Tensor Completion for Traffic Estimation** Aug'19 - Nov'19  
Supervisor: Prof. Ketan Rajawat
  - Worked on **Streaming Tensor Factorisation** and **Bayesian Subspace Filtering** using Mean Field Variational Inference
  - Extended the idea to Traffic estimation on a dynamic setting giving the flexibility to handle multiple relationships in dataset
  - Derived theoretical results on the proposed algorithm and studied techniques (LDL Decomp) to improve the time complexity
- **Robust Principal Component Analysis(Course Project)** Jan'20 - Apr'20  
Supervisor: Prof. Ketan Rajawat
  - Studied and worked on efficient algorithms for **RPCA** and **Convex Optimisation** in **Linear programming problems**
  - Proposed modifications as stimulations involving **randomized estimators** to handle the computational efficiencies
  - Carried experiments to compare performances of **Proximal Gradient Algorithms** with existing optimisers in **Pytorch**
- **Probabilistic Machine Learning** May'19 - July'19  
Programming Club, IIT Kanpur
  - Implemented a **Numpy** based model for density estimation using **Gaussian Mixture model** on **MNIST** dataset
  - Explored advances in **Variational Inference** such as **Stochastic VI**, **BBVI**, **Variational Autoencoders (VAE)**
  - Explored advances in MCMC methods such as **Hamiltonian MCMC (HMC)**, **Langevin Dynamics** etc

## Programming Experience

- **Algorithms in Depth** May'19 - July'19  
Programming Club, IIT Kanpur
  - Studied various graph algorithms such as Dijkstra, Bellman Ford, Kruskal's and Prim, Disjoint Set Union (DSU) etc
  - Studied and implemented various advanced data structures such as Segment Trees, Fenwick Trees etc
- Among top 1% Indians on **Codechef** with a **5\*** rating of **2022** and an active participation in contests

## Technical Skills

Programming	Familiar	Machine Learning	DL Frameworks	Utilities
C, C++, Python	Verilog, SQLite	Numpy, Pandas, Scipy, Gensim	Pytorch	Git, L <sup>A</sup> T <sub>E</sub> X, Shell

## Relevant Coursework

Convex Optimisation	Computer Organisation	Software Development	Logic in Computer Science
Data Structures and Algorithms	Discrete Mathematics	Fundamentals of Computing	Linear Algebra & ODE's
Real Analysis			

## Positions of Responsibility

- **Student Guide - Counselling Service, IIT Kanpur** July'19 - Present
  - Responsible for the guidance and mentorship at a personal level of 5 freshman undergraduates and for the smooth conduction of various events in the Orientation Session for the incoming Batch of Y19
- **Mentor - Association of Computing Activities (ACA), IIT Kanpur** Jan'20 - Mar'20
  - Mentored a group of 10 students on Probabilistic Machine Learning (PML) by introducing them to the field
  - Organised lectures and prepared monthly theoretical and programming assignments to check their progress