



SARTHAK SINGLA



ACADEMIC DETAILS

Year	Degree / Board	Institute	GPA / Marks(%)
---	B.Tech in Computer Science & Engineering	Indian Institute of Technology Delhi	9.698
2019	CBSE	BGS International Public School	96.2%
2017	CBSE	BGS International Public School	10/10

SCHOLASTIC ACHIEVEMENTS

- **IITD Merit Award:** Awarded in Semesters 1, 2, and 5 for being in the **top 7%** of CSE branch students at IIT Delhi. (2022)
- **Google Kick Start:** Secured an **All India Rank of 38** and **Global Rank of 156** in Google Kick Start Round E. (2021)
- **Joint Entrance Examination (JEE) Advanced:** Secured an **All India Rank 72 (GE)** among 245,000 students. (2019)
- **Joint Entrance Examination (JEE) Mains:** Secured an **All India Rank 425 (GE)** among 1.1 million students. (2019)
- **National Standard Examination:** Qualified for Indian National Chemistry Olympiad being in **Top 0.1%** in Delhi. (2018)
- **KVPY Fellow:** Secured **All India Rank 86** in KVPY SA and awarded **fellowship** by IISc and DST, Govt. of India. (2017)
- **RMO: One of 30 students** qualified for Indian National Mathematics Olympiad by clearing the RMO, Delhi. (2017)
- **PRMO: One of 300 students** qualified for RMO by clearing the Pre-Regional Mathematics Olympiad (PRMO) twice. (2016 & 2017)
- **NTSE:** Secured **Rank 1** among 300,000 students in Stage-1 Delhi in the National Talent Search Examination (NTSE).
 - Selected for the **NTS Scholarship** in Stage-2, awarded to **Top 1000** among 1,000,000 candidates across India. (2017)
- **JSTSE:** Secured **Rank 3** among 170,000 candidates in Delhi in Junior Science Talent Search Examination (JSTSE). (2016)

INTERSHIPS

- **Software Developer Intern, Azure NetworkWatcher, Microsoft** **AutoPcap and Analysis** | Jun 2022 - Jul 2022
 - Implemented **Auto-PCap**, which triggers packet captures on Azure VMs on discovering losses in a Connection Monitor.
 - This eliminates the need for prod. to ask customers for captures; they are now auto-triggered and saved to team storage.
 - Implemented an app that uses concurrently triggered captures on 2 Azure VMs and performs **coordinated capture analysis**.

PROJECTS

- **Neurosymbolic Approaches to NLP, Prof. Parag Singla** **B.Tech Project** | Jul 2022 - Present
 - Utilising Neurosymbolic ML approaches to add **modularity** and **interpretability** to **Natural Language Processing** systems.
 - Exploring application of Neurosymbolic ML approaches towards solving competition-level **Mathematics Word Problems**.
- **Label Constrained Reachability on Graphs, Prof. Sayan Ranu** **Year-Long Project** | Sep 2021 - Jun 2022
 - **Discovered** an algorithm for approximate label-constrained reachability on Graphs that **outperforms baselines** on large graphs.
 - Implemented novel **GNN-based** approaches for label-constrained reachability to leverage inductivity on large graphs.
 - Implemented a **neuro-symbolic approach** which combines accuracy of symbolic and scalability of neural approaches.
- **Regular Path Queries Based on Exemplars, Prof. Sayan Ranu** **Summer Project** | May 2021 - Sep 2021
 - Acknowledged for several key experiments in RQuBE paper **published in VLDB'22** (<https://doi.org/10.14778/3489496.3489510>).
 - **Benchmarked NFAs** by sampling destinations from source and regex and comparing nodes yielded by output/input regex.
 - Compared accuracy and efficiency of two NFA inference algorithms: **Biermann-Feldman** and **Raman's Beam Search**.
- **Template Search in Images using CUDA, Prof. Subodh Kumar** **Course Project** | Mar 2022 - Apr 2022
 - Designed an algorithm that uses **filtering** and **RMSD** scores to approximately find occurrences of template in an image.
 - **CUDA** is utilised to offload individual search tasks to the GPU, whose results are combined to produce the final answer.
- **Taxi Domain Learning, Prof. Rohan Paul** **Course Project** | Nov 2021 - Nov 2021
 - Modelled taxi domain as an **MDP** and computed optimal policy for the taxi agent using **Value Iteration** and **Policy Iteration**.
 - Implemented model-free Reinforcement Learning approaches of **Q-Learning** and **SARSA** to learn optimal policy for taxi domain.
- **Term Deposit Predictor, Prof. Parag Singla** **Course Project** | Oct 2021 - Oct 2021
 - Created a decision-tree model to predict of whether a client subscribes to term deposit(yes/no) utilizing a Bank Dataset.
 - Used **Decision Trees** and **Random Forests** for prediction and did decision tree **Post Pruning** to avoid overfitting.
- **Automated Nurse Rostering System, Prof. Rohan Paul** **Course Project** | Oct 2021 - Oct 2021
 - Created a Nurse Rostering System with **hard and soft scheduling constraints** to maximize the soft constraint score.
 - Used **Search Trees** to implement the scheduler and utilized various optimizations like pruning to obtain the best possible roster.
- **MNIST Handwritten Digit Classifier, Prof. Parag Singla** **Course Project** | Sep 2021 - Oct 2021
 - Utilized Support Vector Machines to build **One-One** and **Multi-Class** classifiers for the MNIST dataset and got accuracy of 97.2%.
 - Utilized general purpose convex optimization solver **CVXOPT** and customized SVM solver **LibSVM** and compared the two.

TECHNICAL SKILLS

- **Languages:** (Proficient) Python, C/C++, C# (Familiar) Java, Octave, SML, MIPS, HTML/CSS, JavaScript
- **Libraries and Frameworks:** Pytorch, Pytorch-Geometric, CUDA, OpenMP, OpenMPI, OpenCV, SDL2, Django, Bootstrap



SARTHAK SINGLA



IIT COURSE

Degree	Institute	CGPA
B.Tech in Computer Science & Engineering	Indian Institute of Technology Delhi	9.698

COURSES DONE

Intro. To Computer Science, Intro. To Electrical Engg., Calculus, Linear Algebra & Diffe. Equa., Computer Architecture, Signals And Systems, Probability & Stochastic Pro., Data Structures And Algorithms, Digital Logic & System Design, Discrete Mathematical Structur, Computer Networks, Principles Of Artificial Int., Analysis & Design Of Algorithms, Managerial Acc. & Finac. Mgmt., Machine Learning, Intro To Automata & Th. Of Co., Intro. To Parallel & Dis. Pro., Special Module In Algorithms, Operating Systems

QUALIFYING EXAM

- Joint Entrance Examination (JEE) Advanced Rank: 72 (GE)

POSITIONS OF RESPONSIBILITY

- Mentor, BSW (July, 2021 - May, 2022)