

# SARTHAK SINGLA

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## EDUCATION

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**Indian Institute of Technology, Delhi**

*B.Tech in Computer Science and Engineering*

CGPA 9.660/10

*July 2019 – Present*

**BGS International Public School, Dwarka**

*CBSE(XII)*

96.2%

*2019*

**BGS International Public School, Dwarka**

*CBSE(X)*

CGPA 10/10

*2017*

## SCHOLASTIC ACHIEVEMENTS

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**IITD Merit Certificate:** Awarded in Semester 1 & 2 for being in top 7% students.

**JEE Advanced Rank 72:** Ranked 72 amongst 245,000 students.

**JEE Mains Rank 425:** Ranked 425 amongst 1,147,000 students.

**NSEC:** Qualified for INCHO (Indian National Chemistry Olympiad) in 2018.

**RMO:** Qualified for INMO (Indian National Mathematics Olympiad) in 2017.

**KVPY Fellow:** Awarded Fellowship by Department of Science and Technology, Government of India with Rank 86 in KVPY SA in 2017.

**PRMO:** Cleared in 2016 and 2017. Precursor to RMO (Regional Mathematics Olympiad).

**NTSE Scholar:** One of 922 students awarded scholarship out of 1,000,000 students across India. Ranked 1 amongst 50 students qualified from Delhi for Stage-2.

**NGSE:** Got 100 percentile in NGSE Mains and Qualified in NGSE Advanced in 2016.

**JSTSE Rank 3:** One out of 150 students awarded with scholarship. Ranked 3 amongst 17,000 students from Delhi.

## PROJECTS

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**Image Processing Algorithms**

October 2019 – November 2019

*Intro. to Computer Science(COL100) : Prof. Prem Kalra, IIT Delhi*

*Python*

- Averaging Filter Algorithm - An Algorithm to average out the pixels in the image.
- Edge Detection Algorithm - An Algorithm to detect edges in the image.
- Implemented an algorithm to find least energy path from top to bottom of an image.

**Quantitative Trading and Basics of System Building**

January 2020 – February 2020

*Under Quantify Capital*

- Successfully completed an analysis of 2 stocks.
- Project got rank 2 in Institute.

**Dynamic Memory Allocator**

November 2020 – December 2020

*Data Structures and Algorithms(COL106) : Prof. Rahul Garg, IIT Delhi*

*Java*

- Implemented Free and Allocated Memory Blocks using Doubly Linked Lists.
- Implemented Free and Allocated Memory Blocks using BSTrees and optimised by making them AVLTrees (Trees indexed by Tuple).
- Implemented an Algorithm to Allocate & Free Memory Blocks and Defragment Free Memory.

**Independent Storylines Calculator**

December 2020 – January 2021

*Data Structures and Algorithms(COL106) : Prof. Rijurekha Sen, IIT Delhi*

*Java*

- Made a program to calculate number of independent storylines in a graph representing co-occurrence of characters.

## Backend for Portal

February 2021 – May 2021

*Under Team Materate*

*Django*

- Developed Custom Learning portal and merged existing portals with the current portal.

## MIPS Interpreter for Multicore Systems in C++

February 2021 – May 2021

*Computer Architecture(COL216) : Prof. Preeti Ranjan Panda, IIT Delhi*

*MIPS/C++*

- Made a MIPS Simulator in C++, with focus on efficient management of memory requests to incorporate multiple cores and avoid processor stalls..

## Traffic Density Estimator

February 2021 – April 2021

*Design Practices in Computer Science(COP290) : Prof. Rijurekha Sen, IIT Delhi*

*OpenCV in C++*

- Made a program to estimate the traffic density(queue and dynamic) at a traffic intersection.
- Analyzed various trade-offs to get the best design possible.

## Multiplayer Maze Game

May 2021 – Present

*Design Practices in Computer Science(COP290) : Prof. Rijurekha Sen, IIT Delhi*

*SDL in C++*

- Made a maze game in SDL.

## Regular path Queries Based on Exemplars(RQuBE)

May 2021 – Present

*Prof. Sayan Ranu, Prof. Amitabha Bagchi, Prof. Srikantha Bedathur, IIT Delhi*

*C++*

- Assisted in the efficient implementation of Exemplar based RPQ.

## TECHNICAL SKILLS

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**Languages:** Python, C/C++, Java, MIPS, Dart, HTML/CSS, JavaScript, Octave, MATLAB

**Frameworks:** Flutter, Django, Bootstrap, AutoDesk Inventor, Latex

**Developer Tools:** VS Code, Android Studio

**Libraries:** OpenCV, SDL, NumPy, Pandas

## COMPLETED COURSES

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### Computer Science

- Introduction to Computer Science
- Data Structures and Algorithms
- Discrete Mathematical Structures
- Digital Logic and Hardware Design
- Computer Architecture
- Design Practices in Computer Science
- Programming Languages<sup>1</sup>

### Mathematics

- Calculus
- Linear Algebra and Differential Equations
- Introduction to Probability & Stochastic Processes

### Electrical

- Introduction to Electrical Engineering
- Signals and Systems

### Physics

- Electromagnetic Waves and Quantum Mechanics
- Principles of Electronic Materials

### Others

- Microeconomics<sup>1</sup>
- Introduction to Psychology

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<sup>1</sup>Audit

## Online on Coursera

- Machine Learning
- Neural Networks and Deep Learning
- Financial Markets
- Trading Algorithms

## CURRENT COURSES

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### Computer Science

- Principles of Artificial Intelligence
- Computer Networks
- Analysis and Design of Algorithms
- Natural Language Processing

### Others

- Econometric Methods
- Introduction to Biology for Engineers

## VOLUNTEERING ACTIVITIES

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### National Social Service

January 2020 – Present

*NSS, IITD*

- **Vidya Teaching Project:** Helped students of a local school in their studies, January 2021 to Present
- **Intellify:** Made Mathematics Assignments for the students of Class 10<sup>th</sup>, June 2020 to July 2020.
- **Climate Crusade:** Actively worked to spread awareness of climate change in the campus, January 2020 to March 2020.

### Academic Mentorship

December 2020 – Present

*Board for Student Welfare, IITD*

- Mentored first-year students in their Calculus course.

## CO-CURRICULAR

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**Chess:** Represented hostel in Inter-Hostel Chess Tournament for freshers.

**Art:** Member of Fine Arts Society of IITD “AZURE”

**Guitar Enthusiast**

**Competitive Coding:** Codechef 3 Star Coder, Rating 1751; Codeforces Rating 1442