Pursuing Honors in **Computer Science** and Minors in **Industrial Engineering and Operations Research**

Scholastic Achievements

- Received **Institute Academic Prize** (top **25** students) for exceptional academic performance *(2020)*
- Secured **5 AP** (Advance Performer) grades for exceptional performance in Abstractions and Paradigms for Programming, Calculus, Quantum Physics and Application, Organic Inorganic Chemistry and Physical Chemistry *(2019-20)*
- Achieved All India Rank **28** in JEE-Advanced out of 2,00,000 candidates *(2019)*
- Secured All India Rank **76** in JEE Mains out of 1.2 million candidates *(2019)*
- Received the prestigious **KVPY** fellowship with All India Rank **26** *(2018)*
- Awarded National Talent Search Examination **NTSE** scholarship by NCERT, Govt. of India *(2017)*

Olympiads

- Among India's **top 40** students in Indian National **Chemistry** Olympiad (INChO) to attend the Orientation cum Selection Camp for the International Chemistry Olympiad (ICHO) *(2019)*
- Among India's **top 40** students in Indian National **Physics** Olympiad (INPhO) to attend the Orientation cum Selection Camp for the International Physics Olympiad (IPHO) *(2019)*
- Among India's **top 35** students in Indian National Olympiad in **Informatics** (INOI) to attend the International Olympiad in Informatics Training Camp (IOITC) *(2017)*
- Received Honorable Menton in Indian National Olympiad in **Informatics** and participated in Asia Pacific Informatics Olympiad (APIO) *(2016)*
- Ranked among National **Top 1%** in **NSEP** (National Standard Exam , **Physics**), **NSEC** (National Standard Exam ,**Chemistry**) and **NSEA** (National Standard Exam, **Astronomy**) conducted by IAPT *(2018, 2019)* (2019)

Key Projects

Sokoban AI Agent *Spring 2019*
Guide: Prof. Amitabha Sanyal | Course Project *IIT Bombay*

- Developed Japanese puzzle game Sokoban where given a 2D grid(warehouse) with obstacles and some crates, the AI(robot) finds minimal moves to get the crates to their storage locations
- Implemented **deadlock detection** , **Breadth First Search**, **Depth First Search** algorithms in Racket language incorporating **higher order functions**, **abstractions** and **Functional programming** paradigms
- Experimented with various **heuristics** to quickly discard futile lines of play, and recognize patterns and subgoals, drastically **cutting down** on the amount of search required to reach the solution
- Developed **interactive** single player , two player and AI solver mode using Racket Graphical Toolkit

Proof Reading Rewriter *Autumn 2019*
Guide: Prof. Amitabha Sanyal | Ongoing Course Project : Software and Systems Lab *IIT Bombay*

- Developing web app for a proofreading rewriter using **Django** backend which uses **Natural Language Processing** to correct spellings and grammatical errors and suggest synonyms for words using **NLTK** package
- Checking grammar using **POS tagging** and by equating the sentence structure with predefined grammar rules
- Integrating spell check using levenshtein distance between two strings

Sudoku Spoiler *Summer 2019*
Seasons of Code *Web and Coding Club, IIT Bombay*

- Implemented **Neural Networks** for **hand written digit recognition** in Python
- Developed random Sudoku generator and **Sudoku Solver** in Python
- Detected Sudoku instant from an image using image manipulation(processing and alignment) and **hand written digit recognition** , and then applied the solver on it to find the solution

Other Projects

Decoding Monoalphabetic Substitution *Spring 2019*
Guide: Amitabha Sanyal | Course Project *IIT Bombay*

- Text encryption done by Monoalphabetic Substitution based on a secret word key
- Applied **ETAI, Dictionary Closure** and **Secret Word Enumeration** Strategies to decrypt the ciphertext

Decision Trees *Spring 2019*
Guide: Amitabha Sanyal | Course Project *IIT Bombay*

- Found information gain achieved (entropy difference) by applying a categorising function to the data
- Built a Decision Tree Model by choosing functions that reduce entropy of the data the most

Image Compression and Noise Reduction *Autumn 2019*
Guide: Amitabha Sanyal | Course Project *IIT Bombay*

- Replaced all color vectors in an Image with their **K Cluster Centroids** using **KMeans Algorithm**
- Reconstructed Image from given (possibly overlapping) patches while minimising the **salt and pepper noise**

Technical Skills

Programming	C, C++, Java, Python, Bash, Make, CMake, Prolog, Racket, HTML, Javascript, CSS
Tools and Software	MATLAB, Pytorch, Keras, AutoCad, SolidWorks , Git, LaTeX, Pandas, Matplotlib

Positions of Responsibility

Teaching Assistant, *MA-105 ,Calculus* *July 2019 - Present*

- Conducting regular **tutorial sessions** for a batch of **45** students in association with Prof. Sudhir Ghorpade

Teaching Assistant *September 2019 - Present*
MOOCs : Programming Basics(CS101x) ,Data Structures(CS213x), LaTeX

- Handling **Algorithmic** , **Programming basics** and **LaTeX** modules having more than 25000 students enrolled across the globe by **creating** new material and **reviewing** old ones
- **Monitoring** and **stimulating** discussions on **edX** and **IITBombayX** platforms.

Volunteer, *Web and Coding Club, IIT Bombay* *April 2019 - Present*

- Organised **Coding GC** across all hostels and conducted **sessions** on **Algorithms, Data Structures and STL** with the aim of expanding and strengthening the coding community at IIT Bombay
- Guided **100+** students in making their first app using **Scratch** and conducted hands-on **workshops** on **Git/Github** to introduce them to Open-Source

Trained **50 students** from different colleges for ICPC in association with *Codechef , India* *(June 2019)*

Courses Undertaken

- **Mathematics:** Calculus, Linear Algebra, Differential Equations, Introduction to Probability Theory*
- **Computer Science:** Computer Programming and Utilisation, Abstractions and Paradigms for Programming, Data Structures and Algorithms*, Data Analysis and Interpretation*, Software Systems Lab*, Discrete Structures*, Computer Networks**, Digital Logic Design**, Design and Analysis of Algorithms**, Logic for Computer Science**
- **Misc:** Electricity and Magnetism, Quantum Physics, Chemistry, Biology, Introduction to Electronic Circuits*

** To be completed by November 2019 ** To be completed by April 2020*

Extracurricular

- **Institute Technical Freshman of the Year Award** : Awarded to the students who, in their first year, have excelled in the technical activities and made a significant contribution to the same *(2018-2019)*
- Associated with **National Service Scheme** , IIT Bombay under **Green Campus** program *(2018-19)*
- Awarded **first** position in **CoDecode** (coding competition) organized by **Techfest, IIT Bombay** *(2018)*
- Placed **first** in **Bazinga** (maths competition) organized by **Maths and Physics Club, IIT Bombay** *(2018)*
- Ranked **2nd** in **Game of Codes** (coding competition) organized by KJSIT, Mumbai *(2019)*
- Represented hostel 6 in **Coding General Championship** and achieved **3rd** position overall *(2018)*