Pursuing Honors in **Computer Science and Engineering**

Scholastic Achievements

- Achieved **All India Rank 45** among 240,000 eligible aspirants in **JEE (Advanced)** conducted by IITs *[2019]*
- Secured **All India Rank 11 (100 percentile)** in JEE (**Main**) out of 1.4 million eligible candidates *[2019]*
- Achieved **All India Rank 97** and **KVPY Fellowship** by IISc Bangalore and DST, Govt. of India *[2018]*
- Recipient of National Talent Search Examination Scholarship from **NCERT**, Government of India *[since 2017]*
- Awarded with the opportunity to attend **International Science School** in Australia by **RRI** *[2018]*

Olympiads

- Among the nationwide **top 42** to receive **Gold Medal** in OCSC for **Chemistry** conducted by HBCSE *[2019]*
- Ranked among National Top 1% in NSEC (**Chemistry**) and NSEP (**Physics**) organized by IAPT *[2018]*
- Ranked among National Top 1% in NSEP (**Physics**) and NSEA (**Astronomy**) organized by IAPT *[2017]*
- Ranked among India's **top 300** (National Top 1%) students selected for INJSO **(Junior Science)** *[2015]*

Work Experience

Franklin Templeton Investments *[May 2021 - July 2021]*
Data Science Intern *Fixed-Income Research Division*

- Developed a **robust web scraper** to parse and extract inventory emails and load into database on a **daily basis**
- Queried large-scale database using **MySQL** to compute key deal metrics and keep track of **collateral performance**
- Extracted Price and Discount Margin from Color, and merged and updated older **BWiC** data with the latest numbers
- Worked on **clean extraction** of tabular data in PDFs with the help of libraries **tabula-py** and **camelot** in Python

Key Projects

BASH Debugger *[November 2020]*
Guide: Prof. Amitabha Sanyal | CS 251 Course Project *IIT Bombay*

- Developed a Bash debugging tool supporting basic **linux commands**, conditional statements and function calls
- Created **lexer** and **parser** using **ANTLR** with Python runtime by specifying grammar using **Backus-Naur Form**
- Designed **GUI** application that aids debugging by filtering **variables**, invoking **commands** and accessing **files**

Planet & Atmosphere Renderer in OpenGL *[May 2020]*
Seasons Of Code *Web & Coding Club, IIT Bombay*

- Developed a graphics rendering engine that generates a **Planet** with an **Atmosphere** and allows 3-D maneuvering
- Generated accurate **atmospheric shaders** running in real-time by implementing **Rayleigh** and **Mie** scattering
- Implemented advanced lighting techniques using **Blinn-Phong Shading** in OpenGL Shader Language (**GLSL**)

Textify - Text to LaTeX *[July 2020]*
Institute Technical Summer Project *Institute Technical Council, IIT Bombay*

- Developed a service using **OpenCV** to recognize handwritten text and convert it into digitised LaTeX script
- Implemented **Sobel filtering** to detect text regions and **A-star algorithm** to separate individual text lines
- Trained bidirectional LSTM/GRU based **recurrent network** to output text, with upwards of **90%** word accuracy

RISC 16 Bit Processor in VHDL *[May 2021]*
Guide: Prof. Virendra Singh | CS 226 Course Project *IIT Bombay*

- Devised an efficient, scalable **10** state FSM for 8 register, 16 bit **multicycle processor** having **4MB** of RAM
- Synthesized and assembled **FSM controller**, Datapath and Memory Unit in Quartus Prime using **VHDL**
- Implemented a Python based compiler for assembly to demonstrate and test the run of the **instruction set**

Minor Projects

Comparison of TCP variants *[April 2021]*
Guide: Prof. Vinay Ribeiro | CS 252 Course Project *IIT Bombay*

- Built client and server applications through **socket programming** to exchange files using specified versions of **TCP**
- Automated experiment runs using **Bash** and generated plots for comparing throughput versus delay and packet loss
- Recorded network traffic using **Wireshark** and analysed **window scaling graphs** for TCP Cubic and TCP Reno

Mastermind Player *[February 2021]*
Guide: Prof. Ashutosh Gupta | CS 228 Course Project *IIT Bombay*

- **Encoded** moves of the mastermind game into a **SAT** problem and solved using **conflict driven clause learning**
- Implemented solver in Python using **z3py library** which was robust to the other player lying upto **50%** of the time

Image Compression using Quad Trees *[September 2020]*
Guide: Prof. Ajit Diwan | CS213 Course Project *IIT Bombay*

- Developed a **memory-leak-proof** quadtree class for binary image storage with **highly optimized** space complexity
- Incorporated **efficient** and ubiquitous processing functions including unions, intersections, **resizing**, and **extraction**

Manipulating Morphisms *[October 2020]*
Guide: Prof Ajit Diwan | CS 213 Course Project *IIT Bombay*

- Designed an effective algorithm to find the ith character in the **infinite word** of any **prolongable homomorphism**
- Extended **KMP** to efficiently locate specified **substrings** as well as positions of **subsequences** in the infinite word

Game Theory & its Applications | *Maths & Physics Club, IIT Bombay* *[May 2020]*

- Explored pure and mixed **Nash Equilibrium**, MinMax Theorem and **Bayesian** & **Cooperative** Games
- Analyzed popular examples such as **Prisoners' Dilemma, Battle Of The Sexes** and **A Sheriff's Dilemma**

Course Organizer & Analyzer in Terminal (COAT) *[October 2020]*
Guide: Prof Amitabha Sanyal | CS 251 Course Project *IIT Bombay*

- Generated a **Course Visualizer** in terminal using **Sed** and **Awk** only to **organize & tally** semester related data
- Implemented **bash scripts** for arranging Semester-wise Courses and calculating **cumulative performance index**

Technical Skills

Programming	Proficient in C++, Python | Familiar with C, Bash, Java, JavaScript, Sed, Awk, PHP
Tools and Software	Used MATLAB, AutoCad, Git, LaTeX, Doxygen, Android Studio, SQL, Quartus Prime
Data Science	Familiar with NumPy, Matplotlib, Pandas, TensorFlow, Keras, OpenCV, Beautiful Soup

Positions of Responsibility

Department Academic Mentor | *Department of CSE, IIT Bombay* *[May 2021 - Present]*

- Among the **26 candidates** selected after extensive peer reviews and interviews out of **70+ applications**
- Appointed the **mentor** of **8 sophomore students** to resolve their queries and provide academic guidance

Teaching Assistant | *IIT Bombay* *[Jan 2021 - March 2021]*

- **CH107 - Quantum Chemistry** - Prof A. Chowdhury - Conducted doubt clearing sessions for a batch of **42** students

Summer Of Science Mentor | *Maths & Physics Club, IIT Bombay* *[May 2021 - July 2021]*

- **Data Structures & Algorithms** - Guided 3 students to research and understand the concepts of DSA

Relevant Courses

- **Computer Science:** Data Structures and Algorithms, Computer Networks, Data Analysis and Interpretation, Discrete Structures, Software Systems Lab, Design and Analysis of Algorithms, AI and Machine Learning*, Operating Systems*, Computer Architecture*, Fundamentals of Digital Image Processing*, Blockchains and Cryptocurrency*, Automata Theory**, Databases and Information Systems**, Implementation of Programming Languages**
- **Miscellaneous:** Calculus, Linear Algebra, Electricity and Magnetism, Quantum Physics, Chemistry, Biology, Introduction to Electronic Circuits, Physics & Chemistry Labs, Engineering Drawing, Optimization Models*, Psychology*

**to be completed by Nov 2021 | **to be completed by Apr 2022*

Extracurriculars

- Mentor at **CovEd India**, a non-profit organisation for mentoring students during the Covid-19 pandemic *[2020]*
- Successfully completed a one-year course of **Hockey** under **National Sports Organization** (NSO) *[2019-20]*
- Awarded **High Commendation** as a Delegate in the interschool **DAV Model United Nations v3.0** *[2016]*
- Elected **Secretary** of **Quizzing Club**, conducted quizzes and represented school at quizzing events *[2016]*