Pursuing a **Minor** degree in **Computer Science and Engineering** at IIT Bombay

Academic Achievements

- Secured an All India Rank of **628** in the JEE Advanced exam among **2.45 lakh** candidates [2019]
- Among the top **1%** of students to receive the esteemed **KVPY** (Kishore Vaigyanik Protsahan Yojana) scholarship for higher education out of **1 lakh** participants, after securing an AIR of **717** [2018]
- Secured **99.84%** percentile in the JEE Mains examination among **9 lakh+** student candidates [2019]
- Offered a **scholarship** for higher education on being among **top 2 students in Mumbai** region in Maharashtra Higher Secondary Education (**HSC**) class 12th board exams in **science** stream [2019]
- Selected to appear in the coveted **Indian National Olympiad** (INO) after being among **top 1%** in the country in the National Standard Examination in Astronomy conducted by **HBSCE** [2018]

Work Experience

Student Developer | Google Summer of Code [May - August 2021]
The Zulip project: powerful, open-source group chat application with first-class threading

- Worked on a **Django/Tornado** stack, writing maintainable code with **unit and integration tests**, contributing **200+** commits from **50+** merged pull requests over the entirety of the summer
- Utilized **PostgreSQL** features like **row-level locks** and **transactions** for **concurrency control**
- Developed the **mute users** feature, which was a **release highlight** in the Zulip 4.0 announcement
- Rewrote the email notifications event **queue processor** to be **lossless** by using persistent storage
- Refactored various areas to improve **codebase quality**, while ensuring **backwards compatibility** of the API as well as the Tornado **event queue** system to avoid issues during **server upgrade**

Key Projects

Parallelized Matrix Factorization [April - May 2021]
Course project: High performance scientific computing | Prof. Shivasubramanian Gopalakrishnan

- Implemented the **Modified Gram Schmidt** process and the **Householder** reflection algorithm for **QR factorization** of real, square matrices in **C++**, and compared their performance
- Parallelized the serial algorithms using the **OpenMP** programming library for shared memory multiprocessing and **Nvidia's CUDA** platform and API for **GPU** based parallelization
- Performed a **time study** to analyze the effect of matrix size and number of parallel **threads** on the program's execution time. Achieved up to **60% speedup** over the serial implementation

Comparative Study of Image Compression Techniques [March - May 2021]
Course project: Introduction to Machine Learning | Prof. Biplab Banerjee

- Utilized the **Scikit-learn** python library to carry out **Principal Component Analysis** of RGB component matrices of the image using **Singular Value Decomposition** to reduce the size
- Obtained a **PSNR** value of **24** with **150** components, and up to **62.5%** theoretical size-reduction
- Compared the results with a **60** color points **K-means** implementation as well as a high fidelity generative compression **deep learning** model having PSNR values of 20 and 30 respectively

Git Contribution CLI [September 2020]
Personal hobby project

- Developed a **command-line interface** to generate commit history based **heatmap** graphs similar to GitHub profiles, calculated from local **git** repositories, using the **Go programming language**
- Scanned for **.git** files to detect repositories in all **sub-folders** of a given directory using **recursion**
- Utilized the **go-git package** to find commits authored by a given **email** to generate the graph

Course Rank Portal [June - August 2020]
A central platform for students to rate courses. A collaboration with Institute Technical Council

- Developed a **responsive** web app, **Credit** for writing course reviews, and implemented various features such as **up-vote/down-vote** review, course liking, and admin **moderation** of reviews
- Utilized the **Django** web framework for back-end and **Bootstrap** and jQuery for front-end
- Implemented **OAuth2** module compatible with **SSO IITB** for secure verification of profiles

Positions of Responsibility

Web Convener | Undergraduate Academic Council | IIT Bombay [April 2020 - May 2021]
Part of a 4 member team in UGAC catering to 4500+ students in the institute

- Responsible for **upgrading and maintaining** the council's webpages and **building** new ones
- Developed the **Learnerspace** portal which saw a **400%** YOY increase in course registrations
- Revamped portal for **iSURP** registrations which saw **280+** student enrollments in **90+** projects

Technical Skills

- **Programming Languages**: C++, Python, Javascript (and TypeScript), Go, Java, PHP
- **Tools & Frameworks**: Django, Tornado, CUDA, LaTeX, Git, PostgreSQL, Bootstrap, jQuery
- **Software Experience**: Linux shell, Visual Studio Code, GitHub, Microsoft Office

Extracurricular Activities

- Secured **2nd position** in Shell Energy Day brainstorming competition among **10+** participant teams
- Achieved a **perfect score** in the Maths and Physics **General Championship** SciComp at IITB
- Completed **year-long** training in **tabla** instrument playing as a part of NSO in the freshman year
- Attended an **online** workshop on **professional communication** conducted by SARC IIT Bombay
- Worked as coordinator in **TechFest**, ideating and developing various **social awareness initiatives**
- Awarded **B** grade in the elementary **drawing** exam conducted by the Government of Maharashtra