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DOB: 05/08/2004

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2025	

## ★ SCHOLASTIC ACHIEVEMENTS

- Secured **All India Rank 66** in **Joint Entrance Examination Advanced 2021** among 260,000 candidates. 2021
- Secured **All India Rank 203** in **Joint Entrance Examination Mains 2021** among 1 million candidates. 2021
- Attended **OCSC** camp for International Olympiad of Astronomy and Astrophysics (**IOAA**) | Among **Top 102** in India. 2021
- Qualified and stood among **National Top 1%** in **Indian Olympiad Qualifier in Astronomy, Part I** conducted by IAPT. 2020-21
- Achieved **All India Rank 111** in **Kishore Vaigyanik Protsahan Yojana** conducted by **IISc, Bangalore**. 2020

## </> PROJECTS

**FastChat** | PROF. KAVI ARYA, IIT BOMBAY

Course Project | November, 2022

- Designed and implemented a **Network of Clients** that can send messages to each other through servers acting as mediators.
- Added the feature for users to have group conversations and send images and files.
- Implemented client authentication and communication using open source libraries, allowing users to sign-up and login.
- Ensuring low latency of message deliveries and **end-to-end encryption** between clients.
- Created a SQL server database to store information and messages for offline clients to be delivered when they come online.
- Added a load balancing system to evenly distribute client connections across multiple servers and improve performance.

**Memory Hierarchy Optimization** | PROF. BISWABANDAN PANDA, IIT BOMBAY

Course Project | April, 2023

- Integrated **exclusive, inclusive, and non-inclusive** memory structures using **Champsim** simulation framework.
- Implemented various replacement policies (**LIFO, FIFO, MRU, probabilistic MRU**) to assess system performance.
- Explored **prefetchers** and **cache properties** (block size, cache size, associativity) to optimize system efficiency.
- Benchmarked **IPC** and **miss rate** results for diverse traces, varying prefetchers, replacement policies, and cache properties.
- Tailored memory hierarchy parameters to achieve maximum speedup for **SAT solver specific traces**.

**Modified Tiles Game SAT Solver** | PROF. ASHUTOSH GUPTA, IIT BOMBAY

Course Project | February, 2023

- Developed **arithmetic and boolean encodings** for a modified tiles game using **Z3Py** library.
- Explored and compared efficiencies of different SAT solving methods, implementing **Conflict Driven Clause Learning (CDCL)**.
- Successfully solved the puzzle, demonstrating proficiency in **Z3Py** library and problem-solving skills in constraint solving.

**Rail Planner** | PROF. SUPRATIK CHAKRABORTY, IIT BOMBAY

Course Project | November, 2022

- Developed Software which integrates viewing and managing Train Stations, Journeys and reviews for all Journeys.
- Implemented **multiple data structures** in C++, such as Linked Lists, Dictionaries, Binary Search Trees, AVL, Priority Queue, Heap, Tries and Graphs, to store data efficiently and pre-processed stored data to make search process efficient.

**Generating Representative Images from a Sample** | PROF. SUYASH AWATE, IIT BOMBAY

Course Project | October, 2022

- Implemented a program to use **Principal Component Analysis (PCA)**, to generate new representative images of the fruits, using the dataset of images of various fruits given.
- Used PCA to analyse images of handwritten digits from the MNIST Database stored as 28×28 matrix of numbers and optimally reduce the dimensionality to 84, such as to maximize the total dispersion of the original data, and reconstruct the image.
- Implemented Hyperplane fitting of 2 random variables and sampled points in the Euclidean Plane distributed in a region according to a given multivariate distribution.

**Tic-Tac-Toe** | PROF. KAVI ARYA, IIT BOMBAY

Course Project | October, 2022

- Implemented **Tic-Tac-Toe** game in **Java**, with the two players on different ports in **peer-to-peer network**.
- Learned **socket programming** and **inter-process communication** along with exception handling.
- Studied **multi-threading** fundamentals and concurrency ideas along with **synchronization** in Java.

**Image Classification using CNN** | ANALYTICS CLUB, IIT BOMBAY

Winter Project | January, 2023

- Gained an understanding of neural networks, optimization strategies and the calculations involved in backpropagation.
- Investigated the impact of normalization and various activation functions on the training of neural networks.
- Learned about the role of kernels in extracting features from input data for image recognition and classification tasks.

## ⚙️ TECHNICAL SKILLS

**Programming Languages & Utilities:**

C, C++, Python, Java, VHDL, Assembly, Bash, Git, Matlab,  $\text{\LaTeX}$

**Data Science:**

Matplotlib, NumPy, SciPy, Pandas, TensorFlow, Keras

**Development:**

HTML, CSS, Bootstrap, JavaScript, PostgreSQL, AutoCAD

**Exposure:**

Docker, WireShark, NS3

## 📅 EXTRA-CURRICULAR ACTIVITIES

- Volunteered for community service under Dhruv Initiative of Education Outreach, NSS IITB and **contributed 80+ hrs teaching** mathematics to children.