

Omkar Shirpure

THIRD YEAR UNDERGRADUATE

Indian Institute of Technology Bombay · Computer Science and Engineering

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Education

Indian Institute of Technology Bombay

Mumbai, India

BACHELOR OF TECHNOLOGY, MAJOR IN COMPUTER SCIENCE AND ENGINEERING

2022 - 2026

- Pursuing minors in Entrepreneurship at Desai Sethi School of Entrepreneurship, IIT Bombay

Honors & Awards

2022	All India Rank 1* , Joint Entrance Exam Advanced, among 150K candidates	India
2022	99.49 percentile , MHT-CET examination, among 300K candidates	Maharashtra
2022	98.93 percentile , Joint Entrance Exam Mains, among 1.5 M candidates	India
2021	KVPY Scholarship Awardee , Indian Institute of Science and Government of India	Bangalore
2020	NTSE Scholarship Awardee , Government of India	India
2019	Silver Medal , Dr. H. Bhabha Balvaidnyanik Exam, among 100K candidates	Mumbai
2018	State Rank 8 , MSCE Scholarship, among 100K candidates across state	Maharashtra

Work Experience

LawGPT Team, Flomoney Pvt. Ltd.

Singapore

AI INTERN

May. 2024 - Jul. 2024

- Utilised a pipelined, pre-trained BART transformer for chronological analysis of the legal documents.
- Achieved upto 95%+ accuracy when tested using weighted semantical and syntactical similarity metrics.
- Created a custom library for graphs extraction from documents using combination of LayoutLMv3 and OpenCV, for improved performance on contextual quantitative data.
- Dockerized and packaged it as a containerized application for future testing and deployment on Azure.

Frontend Development Team, A&PL

USA

SOFTWARE DEVELOPER INTERN, PRO-SPACE

Feb. 2024 - May. 2024

- Developed a Flutter application for both Android and iOS platforms, worked on tech-stack that included Node.js as back-end, Firebase database and Express for building RESTful APIs.
- Integrated third-party APIs into the app, such as Stripe for payments, Firebase Cloud Messaging for notifications, Google Maps, and verified third-party authenticated login using OAuth.
- Stress-tested systems using Postman and Flutter-test, evaluating performance metrics under peak usage.
- Released as alpha in v1.0, integration with the existing web workflow of the services provided.

Projects

Algorithmic Trader

IIT Bombay

CS 213, COURSE PROJECT, PROF. ASHUTOSH GUPTA

Spring 2024

- Developed a market simulation, used threads to receive orders from traders, implemented median trading and statistical arbitrage strategies to send orders to the market for profits.
- Processed order books sent over sockets, making trades based on estimated market prices and designed efficient algorithms for detecting arbitrage opportunities by pruning quantities of the orders.
- Implemented custom classes for data structures such as order trie, red-black trees, heaps for efficiency.

Secure e-Ticket Entry Permit System (STEPS)

IIT Bombay

DEVCOM X ASC HACKATHON

Spring 2024

- Secured 1st place for creating a foolproof Secure e-Ticket Entry Permit System (STEPS) for events, capable of secured entry-exit even without internet connectivity.
- Implemented multiple secure environments within app to prevent tampering and data alteration.
- Developed a HiveDB local database with HMAC encryption for secure on-device storage of user data.

Advanced Bayesian Optimizer

IIT Bombay

OPTIMIZER ML COMPETITION, AZEOTROPY, CE SYMPOSIUM 2024

Spring 2024

- 6th among 95+ PAN-IIT teams; achieved 0.4% deviation, making most accurate prediction inter alia.
- Engineered an advanced Bayesian Optimization model using Gaussian Process Regression in 3-Dimensions.
- Incorporated an acquisition function that strategically employs Expected Improvement to enhance predictive accuracy of queries to find minima for an unknown Black-Box function.

Roc-swarm

IIT Bombay

SELF PROJECT

Summer 2024

- Developed Pygame simulations, implemented NEAT algorithm for flight training of individual drones.
- Conducted comparisons of manual, Kalman estimation, and genetic algorithm-trained models, with the latter outperforming all the other drone and swarm flight control models by significant margins.
- Implemented protocols for decentralized decision making in swarm operations to complete group tasks.

Minion-Grid

IIT Bombay

CS 104, COURSE PROJECT, PROF. KAMESWARI CHEBROLU

Spring 2023

- Developed a web-scraper that extracts data recursively, with command-line interface for utilisation.
- Implemented features like recursion depth, multiple target URLs, search for keywords, extensions in pages.
- Created agents and implemented multi-threading to scrape the data faster, increasing overall efficiency.

Options Pricing Model

IIT Bombay

FINSEARCH, FINANCE CLUB, IIT BOMBAY

Summer 2024

- Conducted in-depth research on options pricing models, analyzing the Greeks, and developing advanced strategies for options trading, monitored correlation of various stock indices across sectors.
- Implemented the Black-Scholes model, Binomial Tree Model, and Monte Carlo Simulation using NumPy.
- Built a back-testing framework using Pine Script, achieving overall returns of up to 55% by leveraging insights from correlation analysis in index pairs.

Extracurricular Activity

Core Member DEVELOPERS' COMMUNITY, IIT BOMBAY

Jan. 2023 - Mar. 2024

- Part of 25+ member team, responsible for design, development and maintenance of institute projects.
- **InstiApp** : Over 10,000+ downloads and 3,000+ MAUs meeting info-social needs of IIT Bombay campus.
 - Developed Buy-n-Sell feature on InstiApp, easing student trades of secondhand goods.
- **Mess-I** : Digitalized mess management platform serving over 10,000+ students daily across 10+ hostels.
 - Implemented a remote configuration feature that facilitates remote debugging.

SARCathon PAN-IIT HACKATHON ORGANISED BY SARC, IIT BOMBAY

Dec. 2023

- Placed 5th among 120+ PAN-IIT teams, awarded for developing most feasible solutions.

Skills

Programming	C/C++, Python, PineScript, R, Bash, x86 and MIPS Assembly, VHDL, DART
Utilities	Azure, Elastic Search, HiveDB, Docker, , MATLAB, Git, Sed, Awk, GDB
Data Science	Excel, NumPy, Pandas, Matplotlib, SciPy, PyTorch, TensorFlow, scikit-learn
Development	Flutter, Django, TypeScript, MonogoDB, PostgreSQL, JavaScript, Angular

Relevant Coursework

* Data Structures and Algos	* Analysis of Algorithms	* Discrete Structures
* Data Analysis & Interpretation	* Software Systems Lab	* AI and ML
* Computer Architecture	* Operating Systems	* Logic and TOC
† Computer Networks	† Abstractions and Paradigms	† Database Systems

*: Completed

†: To be completed by Spring 2025

Miscellaneous

- Assisted in logs analysis at Computer Center, IIT Bombay, analyzing and scrutinizing logs using ELK Stack.
- Organizer in Marketing Division of E-Summit, Flagship event of Entrepreneurship-Cell, IIT Bombay.
- Achieved A grade in both Elementary as well as Intermediate State Drawing Examinations.
- Curated intuitive, activity-based questionnaires impacting over 20+ students under National Service Scheme.