Hardik Rajpal
Computer Science & Engineering
Indian Institute of Technology Bombay

200050048
B.Tech.
Gender: Male
DOB: 24/02/2002

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2024	9.64

Scholastic Achievements

- Awarded **3 AP** (Advanced Performer) and **28 AA** grades for exceptional performance. *(2021)*
- Received **Institute Academic Prize** (top **20** of CSE Batch) for stellar academic performance. *(2021)*
- Secured **All India Rank 6** in **JEE Advanced** amongst 1,50,000 candidates. *(2020)*
- Secured **All India Rank 111** in **JEE Main** (B.Tech) amongst 9,20,000 candidates. *(2020)*
- Received the **Reliance Foundation Scholarship** alongside **80** other candidates. *(2020)*
- Qualified for **Indian National Physics Olympiad** alongside **457** other students. *(2019)*
- Selected for **Kishore Vaigyanik Protsahan Yojana Exam**, ranking **73rd** in the aptitude test. *(2019)*

Work Experience

Quadeye Securities LLP | *Internship* *May 2023 - July 2023*
Quant Strategist — C++, R, RCpp, bash

- Implemented and thoroughly optimized a historical trade simulator in **R**, **C++** and **RCpp** to test arbitrage strategies.
- Tested and analyzed various strategies, varying order types and equity-futures arbitrage choices.
- Wrote dozens of bash and R scripts to manipulate and analyze input and output data files spanning tens of gigabytes.

WinZO Games | *Internship* | *Mr Abhishek Goyal, Mr Vasu Vardhan* *May 2022 - July 2022*
Backend Developer — React, Cassandra, Jest, PostgreSQL

- Designed and implemented unit testing suite from scratch for one of the key services using **Jest**.
- Implemented several endpoints, notably, an efficient one for player skill update using prefix sums in **Apache Cassandra**.
- Undertook research tasks: automated syntax documentation of API endpoints and extraction of debug logs from packages.

Bodhitree | *RnD* | *Prof. Kamewari Chebrolu* *January 2022 - April 2022*
App Developer — React Native

- Designed and implemented core app navigation structure with nested stack navigators and drawers.
- Implemented custom components to engage users with content such as a video player and question widgets.
- Produced a final release build covering all of the course content and functionality permissible with the API.

Projects

IPL-C | *Course Project for CS302* | *Prof. Amitabha Sanyal* *January-April 2023*
→ Compiler for C with only integers — Bison, Flex, C++, YACC

- Implemented a grammar to handle control flow statements in C including if-else, while and for.
- Implemented the logic to build **abstract syntax trees** from input programs to process compound expressions.
- Implemented a translation scheme to generate **three-address intermediate code** for generation of x86 code.

CycOOPs: Artist | *Personal Project* *April 2022 - May 2022*
→ Enhanced HTML5-canvas-inspired Graphics library — C++

- Implemented a comprehensive class hierarchy for shapes and sprites to facilitate faster animations.
- Incorporated **multithreading** to permit sequential animation instead of iterative.
- Integrated **GTK event callbacks** to permit interactive animations responsive to clicks and key presses.

SimpleGraph | *Course Project for CS293* | *Prof. Bhaskaran Raman* *October - December 2021*
→ C++ library for working with graph data — C++, Electron, Javascript

- Implemented a hierarchy to process, and several practical functions to parse and modify graph data.
- Designed an efficient program to render the graphs dynamically in an interactive window.
- Established communication between the library and the application for rendering the graph.

Technical Skills

Languages: C, C++, Python, SQL, Typescript, HTML/CSS, Java, Dart, R/RCpp, Assembly, Bash and other Unix tools.
Frameworks/Libraries: Angular, React, Electron, Socket.io, Express, React Native, Android Development, Flutter, Django, Numpy, PyTorch, Selenium, OpenCV, NLTK.
Applications: DataGrip, pgAdmin, VS Code, Android Studio, Chrome Dev Tools.
Others: GitHub, AWS Amplify, GDB, CMake, Regex, Latex, AutoHotKey Scripting.

Relevant Courses

- **Computer Science:** Data Structures and Algorithms, Design and Analysis of Algorithms, Discrete Structures, Game Theory and Algorithmic Mechanism Design*, Program Analysis*, Automata Theory, Implementation of Programming Languages, Abstractions and Paradigms in Programming, Logic for Computer Science, Digital Logic Design and Computer Architecture, Computer Networks, Operating Systems, Database and Information Systems, Topics in Virtualization and Cloud Computing, Foundations of Network Security and Cryptography*, Artificial Intelligence and Machine Learning, Speech and Natural Language Processing, Computer Vision.
- **Mathematics:** Linear Algebra, Data Analysis and Interpretation, Calculus, Introduction to Numerical Analysis, Probability-I*.

* Ongoing