Dhruv Jaiswal

New Delhi, India | Email | Website | Github

Education

Indraprastha Institute of Information Technology, Delhi (IIITD)   (2023 - Present)
Bachelor of Technology, Computer Science Engineering   **CGPA: 9.26** (till semester 3)
- Ranked **5th** in batch out of 613
- **Distinguished Dean's List for Academic Performance** member in college

Technologies

Skills	Operating Systems, Algorithm Design, Runtime Interference Mitigation (Caladan and ghOst framework), ML/DL, Data Structures
Programming Languages	Python, C/C++, Java
Tools and Technologies	Git/Github, Manim, Maven, Gradle, JUnit, Godot, KSCHED, Caladan, TensorFlow, Pytorch, Numpy, Pandas, Matplotlib, libGDX, Box2D, Google Collab, scikit-learn, POSIX threads, SARIMAX
Technical Electives	Operating Systems, Statistical Machine Learning, Advanced Programming, Database Management Systems, Analysis and Design of Algorithms, Computer Organization, Theory of Computation

Experience

Mutual Funds Investment Optimization | Research   (Sep, 24 – Present)
Guide : *Vaibhav Gupta* (IQC rank 1)   [*Python, SARIMAX*]
- Developed a forecasting model for mutual fund data using SARIMAX, optimizing accuracy in high-frequency time-series prediction.
- Engineered **30+** exogenous variables (e.g., EPS, FII, DII, macroeconomic indicators) to improve model precision.
- Achieved **75%** forecast accuracy, significantly improving the NAV predictions of mutual funds and performance.

Runtime Interference Mitigation | Research & Development   (Dec 24 – Present)
Guide : *Dr. Vivek Kumar*   [*C/C++, Caladan, ghOSt*]
- Creating energy efficient runtime systems that prevent interference by up to 1100% such as hyperthreading and LLC cache.
- Currently under the High Performance Computing Lab.

DataCurve AI Open Source Developer | Project Loki (Shipd)   (Mar, 25 – Present)
- Contributed to FAANG-backed AI research by resolving issues in open-source Python repositories like pandas, pip, and scipy.
- Diagnosed and fixed software bugs, optimizing functionality and performance in AI-related tools.

Open Source Development | Industry   (Dec, 24 – Present)
Guide : Leo Torres, *Grant Sanderson*   [*Python*]
- Contributed in maintaining and fixing issues in the open source math library animation engine for explanatory math videos.
- Over 200+ lines of code written including fixes of animations, vectors and opacity.

Projects

Simulating cryptographic attacks on RSA   (Aug, 24 – Nov, 24)
Guide : *Maria Eichlseder's lectures*   [*Python*]
Demonstrating the Wiener's Attack on RSA with a small private exponent, using the concept of continued fractions. Also proving the correctness of the attack mathematically.

Operating System Shell Functionality Modules   (Aug, 24 – Dec, 24)

Guide : _Dr. Vivek Kumar_ (Course Instructor)   [_C/C++_]
Created multiple modules for functions of the shell of Linux systems like Schedulers using Round Robin policy,
Page allocator and a Simple Multithreader

Angry Birds game   (Aug, 24 – Dec, 24)
Guide : _Dr. Arun Buduru_ (Course Instructor)   [_Java, Gradle_]
Created a recreation of the popular mobile game Angry Birds using Gradle framework and Box2D physics.
Finished with testing using JUnit and serialization of save states.

Interpreter for C-like language   (Dec, 24 – Jan, 25)
Guide : Crafting Interpreters by _Robert Nystrom_   [_Python_]
An interpreter that implements a limited C-like language using BNF concrete syntax. Using Pratt-Parsing to
evaluate expressions using Top Down Operator Precedence.

Movie Recommendation system with Linear Algebra   (Mar, 24 – Apr, 24)
Developed an algorithm which takes data of reviews of users and suggests movies   [_Python_]
on the basis of the movies you like. The algorithm is true to the Page-Rank Algorithm of Google.

Implementing Dimensionality reduction on MNIST   (Feb, 25)
Performed different permutations of PCA, FDA, QDA and LDA and created a pipeline   [_Python_]
to obtain 99% precision on the MNIST dataset.

Making a compiler and executor compatible with the RISC-V architecture   (Jan, 24 - Mar, 24)
Implemented a subset of the RV32I instruction set (RISC-V 32-bit integer), making   [_Python_]
an assembler and simulator for the same.

Academic Research

Tower of Hanoi extensions with emphasis on graphical representations   Nov 2024

- Studied Hanoi graphs with the lens of fractals from dynamical systems and Group theory from Abstract Algebra.
- Conjectured some solid statements regarding the existence and shape of these graphs.

Honors and Awards

- Rating of **1432** on Codeforces.
- **Distinguished Dean's List for Academic Performance** member in college
- Runner up of Shri Niamat Rai **Contest of Investigatory Projects in Mathematics**
- JEE advanced percentile of **99.4**