Hiten Dalmia

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Education

B. Sc. (Hons.) Mathematics — Nov. 2022 – Present
Kirori Mal College, University of Delhi, Delhi

Majoring in **mathematics** with a minor's degree in **economics**. Current GPA (in %): **82.9**

Articles

On Computable Normed Almost Linear Spaces 2025

- We study the notion of a computable normed almost linear space and examine some results of the theory of operators in normed almost linear spaces in the context of computability. Specifically, we establish the effectivity of the Inverse Mapping Theorem in the normed almost linear spaces.

Computable Analysis: Mathematical Foundations and Computability of Real Functions Using The TTE Approach 2025

- Co-authored with Sujit Kumar (first author), this paper gives a simple introduction to computable analysis, specifically, the representations-based approach. We introduce naming systems, admissible representations, along with computability on several objects used in real analysis. We end with showing the computability of differentiation and the absence of it in integration.

Research Projects

***p*-adic numbers**, Supervisor: Mr. B. Sèmthanga 2025

- Studied the p-adic norm and its properties, Ostrowski's Theorem, construction of the field of p-adic numbers and their basic algebra, resulting in a 13-page report. Presented a talk on the p-adic metric space based on the report.

Tracing Closed Curves with Epicycles, Supervisor: Prof. S. K. Kaushik 2024

- In this paper me and my co-authors introduce the fundamental concepts of Fourier series and transforms (continuous and discrete), going into their mathematical formulations, properties and applications. Along with it is a python program that performs the discrete Fourier transform to animate closed curves (stored as SVGs) with epicycles.

Big-*O* Notation, Supervisor: Prof. S. K. Kaushik 2023

- Explored the mathematical foundations and applications of Big O notation in calculus and computer science, including algorithm complexity and asymptotic analysis. Emphasized rigorous formal definitions, graphical interpretation, and pedagogical approaches using Landau symbols for error estimation and function growth.

Corporate Experience

Freelance & Fractal — Mar. 2023 – Present
Full Stack Developer

- Worked as a freelance full-stack web developer to support my college education, securing projects independently on Upwork and through Fractal, a freelance agency I co-founded.
- Developed a range of internal business applications, e-commerce platforms, and designed digital media for brand communication, utilizing diverse web technologies and frameworks like Flutter, NextJS, Python (Tkinter, Selenium, Pandas), and others.

Tagglabs Experimental Pvt. Ltd., Gurgaon — Oct. 2023 – Apr. 2025
Software Developer (Contract)

- Began as an intern and was subsequently retained as a part-time/contract software developer after three months, reflecting strong early contributions.
- Led the development of the alpha release of a cross-platform augmented reality, location-aware mobile application using Flutter for Android and iOS.
- Developed an internal Flutter package for the application, integrating the SIFT algorithm for feature matching via native C APIs and the OpenCV library. Used Python's Django library for the back-end server of the platform.

Independent Projects

Drawing My College's Logo on the Complex Plane 2025

- Implemented the Discrete Fourier Transform algorithm in Python to approximate the fourier series for SVG Paths using the DFT.
- Used Matplotlib to draw the logo onto the complex plane.

Data Analysis and Visualisation with Pandas *Course Project* 2024

- Worked on a US Housing dataset with the python libraries Seaborn, Pandas and Numpy.
- Drew statistical inferences using Violin Plot, Scatter Plot, KDE Plot etc.
- Found correlations between various characterisitcs of the US Housing market using basic statistical descriptions.

Behavioural and Statistical Experiment *Randomness Challenge* 2021

- Test the ability of users to be random by asking them to click 6 identical buttons in a random fashion.
- Uses different statistical methods to analyse the data collected, uses a REST API to store data in an Object Relational Database.
- Made using ExpressJS, ReactJS, Heroku and MongoDB.

MERN Stack E-commerce Website *Cz Creation Online Shop* 2021

- A fully fledged e-commerce website for a small business taking their products online.
- It has user authentication using JWT tokens, CRUD operations like the ability to add items to cart, place orders, forgot password etc. implemented using a REST API.
- Made using MERN stack, hosted on Heroku.

Medicine Tracker Android App *Medcheck* 2021

- An app made using React Native that tracks your medicines for you and warn you whenever a particular medicine is running low.
- Made using Expo, React Native, SQLite3.

Automatic Attendance System using Python and Tesseract-OCR *Breeze* 2020

- Enables a teacher conducting a class to take attendance effortlessly in Google Meet using the chat. Made using Python and Tesseract-OCR.

Selected Coursework

Real Analysis
Abstract Algebra
Linear Algebra
Metric Spaces
Complex Analysis
Numerical Analysis
Probability and Statistics
Differential Equations
Multivariate Calculus
Linear Programming
Financial Mathematics
Functional Analysis
Topology

Extracurricular Activities

The Debating Society, Kirori Mal College *Member* Feb. 2023 - Present
Tensors, The Mathematics Society, Kirori Mal College *Content Co-head* Feb. 2023 - Jul. 2023
Parivartan, The Gender Forum, Kirori Mal College *Join Secretary* Nov. 2022 - Nov. 2024
IMPACT Project, a non-profit consulting group *Member* Feb. 2023 - Nov. 2023
Energy Conservation Club, D.A.V. Public School *Organiser* Jul. 2018 - Mar. 2020

Skills

- **Languages:** Hindi, English, Telugu
- **Programming Languages:** Python, Javascript, C++, R, Mathematica, SQL, Dart
- **Tools:** Vim, LaTeX, Linux, Bash, NodeJS, Flutter, ReactJS, React Native, TallyPrime ERP, Adobe Photoshop