

# ROHIT RAJ

Senior Undergraduate, Mathematics And Scientific Computing, IIT Kanpur

Minors in Computer Systems and ML

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## ACADEMIC QUALIFICATIONS

Indian Institute of Technology Kanpur

B.S, MTH CPI: 5.8/10

2021 - 2025 Kanpur, India

S.N.S. College, Gaya, Bihar

XII, BSEB Percentage: 80.6%

2021 Gaya, Bihar

R.D. Public School, Gaya, Bihar

X, CBSE Percentage: 94.4%

2019 Gaya, Bihar

## SCHOLASTIC ACHIEVEMENTS

- Secured **All India Rank 2701** in **JEE (Advanced) 2021** among 1.5 Lakh shortlisted candidates
- Secured **All India Rank 1098** in **JEE (Mains) 2021** among 10 Lakh candidates.
- Reached **Gold Level** in world Quant Challenge and was offered Brain quantitative **research consultant** position.

## COURSES

\* ongoing

- Probability and Statistics
- Data Structure and Algorithms
- Programming For Performance\*
- Introduction to Machine Learning
- Introduction to Reinforcement Learning
- Set theory and Logic
- Monte Carlo Markov Chain
- Embedded & Cyber-Physical Systems
- Introduction To Modern AI \*
- Generative AI\*

## TECHNICAL SKILLS

Programming: C, C++, Python,Java, R , Solidity

Tools & Framework: Spring Boot,FastAPI, Django,Docker

Libraries: PyTorch, Numpy, Pandas, Matplotlib, Ethers.js

Seaborn, Scikit-learn, Pytorch, OpenCV

Command-line: Linux/Unix shell, Bash scripting

Build & CI/CD: Make, CMake, npm, GitHub Actions

## LEADERSHIP

Organiser, Marketing

Udghosh'23(Annual sports Fest), IIT Kanpur Aug'23-Dec'23

- Spearheading a 3-tier team of 20+ senior executives and 40+ junior executives in the festival.
- Led the marketing team of Udghosh for the Campus Ambassador program and successfully secured sponsors

Secretary in Table Tennis

Games & Sports Council, IIT Kanpur Oct '22-Apr '23

- Organized sports events, including intra-college and inter-college competitions, significantly increasing student participation and engagement.

## WORK EXPERIENCE

Outer Orbit Technologies

Software Engineering Intern

May '25-July '25

- Developed** a full-stack log viewer using Python and **React** to provide a live stream of application logs.
- Containerized application with **Docker** for deployment across environments.
- Reduced** average bug discovery time by **over 90%** by creating features like live-search and custom alerts.

## PROJECTS

MyGate: AI-Powered Community Management System |

- Built full-stack visitor management platform with AI copilot using OpenAI function calling, real-time Firestore updates, and role-based access control deployed on Google Cloud Run
- Implemented secure RBAC with Firebase custom claims, server-side validation for AI operations, immutable audit logging, and FCM push notifications for instant community alerts
- Designed admin analytics dashboard with SLA tracking, society broadcast system, and responsive React frontend with real-time visitor status updates across multiple user roles

Programming for Performance

Prof. Swarnendu Biswas |

Aug '25- Sep'25

- Vectorized matrix multiplication** using Intel SSE4/AVX2 intrinsics →**7.2x speedup**
- Optimized 10D search** using **LICM**, **loop unroll** and **partial sums** →**2.3x speedup**
- Implemented **CUDA kernel** for **2D/3D convolution** →**1520x/3264x speedup**
- Developed **concurrent open-addressing hash table** & **concurrent lock-free stack**
- Worked extensively in **Unix** environment, using **command-line tools** for profiling, debugging, and **optimizing** performance-critical code.

Uncovering the Mask of XORRO

Prof. Purushottam Kar |

Jan '25-Feb '25

- Mathematically** derived **simple XORRO PUF** vulnerability to **linear model attacks**
- Extended the linear model to crack **16-XORROs PUF** using mathematically derived **1040-dimensional feature vector** derived from **72-bit challenge vector**
- Achieved **99.82% train** & **99.2% test accuracy** using **LinearSVC model (L1 penalty)**

Playing with the Melbot

Prof. Purushottam Kar |

Mar '25-Apr '25

- Developed **decision tree** to **guess secret** from **5167 words** allowing **≤ 15 trials**
- Designed **greedy algorithm** to find **optimal query word** at each node of tree
- Achieved **100% accuracy**, **4 trials/word**, **0.23s train time** & **1.5 MB model size**

Decentralised Certification

Kerala Blockchain Academy |

Aug '24-Nov '24

- Designed and deployed an **Ethereum-based decentralized application (DApp)** in **Solidity** for secure, tamper-proof certificate issuance.
- Implemented **NFT-based** credentials (ERC-721 tokens), providing students with portable, verifiable, and ownership-proof digital certificates.

Reinforcement Learning Quest

Prof. Subramanya Swamy Peruru |

Aug '23-Nov '23

- Implemented and compared **SARSA** and **Q-learning** algorithms to analyze their performance in a cliff walking grid world environment.
- Implemented **policy gradient** algorithm for balancing a cart pole,variants with and without a baseline, and evaluated their performance.