



RITIK RAJ | 20MI31016

MINING. ENGG. (M.Tech Dual 5Y)  
MINOR in COMPUTER SCIENCE & ENGG. (B.Tech 4Y)  
MICRO SPL. in ARTIFICIAL INTELLIGENCE AND APPLICATIONS

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## EDUCATION

Year	Degree/Exam	Institute	CGPA/Marks
2025	M.TECH Dual Degree 5Y	IIT Kharagpur	8.51 / 10
2019	AISSCE-XII	Delhi Public School, Bokaro	92.8%
2017	AISSE-X	Notre Dame Academy, Munger	10 / 10

## INTERNSHIPS

Full-stack Developer Intern | Department of Mining Engineering | IIT Kharagpur [ May '23 - Jul '23 ]

- Developed a **full-stack** department portal utilizing **Django**, **Angular** and **SQLite** for managing and showcasing academic activities
- Implemented custom Django permissions for **role-based authentication**, enabling data modification for professors and scholars
- Engineered a Django management command utilizing **pandas** and **openpyxl** for **data migration** from Excel sheets to the database
- Automated Django **database backups** via a custom management command, scheduling a cron job to store backups on **AWS S3**

Korangle Softwares | Web Developer Intern | Remote [ May '22 - Jun '22 ]

- Executed a seamless transition to a **component-based** frontend architecture in **Angular**, fostering modularity and code reusability
- Integrated **multi-factor authentication** through custom authentication **middleware** in **Django**, enhancing platform security
- Leveraged **Django Signals** to create custom signal handlers triggered upon object creation allowing **automation** of various tasks

## PROJECTS

Password Protected Secret Sharing from Lattices | Bachelor Thesis Project [ Aug '23 - Nov '23 ]

Professor Ratna Dutta, Department of Mathematics and Computing, IIT Kharagpur

- Developed a **quantum-safe** PPSS scheme leveraging the hardness of **decisional LWE**, ensuring secure sharing of secrets on servers
- Engineered a **FHE** scheme in **C++** leveraging the **GSW** framework enabling **secure computations** on ciphertexts over servers
- Implemented the **SSS** algorithm in **C++** for secure information distribution on servers with **threshold-based reconstruction**

Algorithmic RQD Determination from Rock Core Imagery | Course Project [ Aug '23 - Nov '23 ]

Professor Debashish Chakravarty, Head of Autonomous Ground Vehicle (AGV), IIT Kharagpur

- Developed an **automated** system for **RQD** determination from rock core images, leveraging **image processing** & **edge detection**
- Engineered **algorithms** for accurate measurement of individual rock core lengths, and crack determination utilizing **opencv** & **pandas**
- Enhanced the **accuracy** by refining the image through **contour analysis**, **Gaussian blurring**, and **Canny edge detection**

CryptoLancer | Hackout 2023 [ Nov '23 ]

- Developed a freelance platform, optimizing project execution through **Smart Contracts**, utilizing **React**, **Solidity** & **Firestore**
- Integrated **GitHub Authentication** for clients to seamlessly link repos, define milestones, and allocate rewards using the **GitHub API**
- Secured funds** in a smart contract with **phased release** & incorporated a 10% penalty for project removal directed to the assignee

ClickCart | An Ecommerce Website [ Dec '22 ]

- Developed a full-stack eCommerce website with **Django** employing modular design patterns and **session-based authentication**
- Integrated a payment gateway and implemented **AJAX** functionality using **JavaScript** enabling **asynchronous** data exchange
- Utilized **Pytest's parametrization** and **Coverage** tool to dynamically generate & execute test cases ensuring comprehensive testing

## POSITIONS OF RESPONSIBILITY

Senior Member | Web Team | RP Hall | IIT Kharagpur [ Jan '22 - Feb '23 ]

- Key contributor on RP Hall's web team, **leading** website development, maintenance, and active involvement in **recruiting** new members
- Revitalized the website by upgrading to the latest **Bootstrap**, **Django**, **Python**, and relevant packages, addressing numerous bugs

Web Head | Department of Mining Engineering | IIT Kharagpur [ Apr '23 - Present ]

- Spearheaded the design and development of the official website, utilizing **Django**, **Angular** and **SQLite** within a span of **60** days
- Led** the recruitment of freshers, **conducted** technical interviews & **assigned** role-specific tasks for continuous maintenance of website

## AWARDS AND ACHIEVEMENTS

- Maximum rating of **1491 (Specialist)** at Codeforces, handle: **ritikraj26** | Highest Global rank: **623** (Div 2) among **25000+** participants
- Maximum rating of **1846 (4 stars)** at CodeChef, handle: **retro\_26** | Highest Global rank: **788** (Div 2) among **20000+** participants
- Secured a Global Rank of **599** in **Google KickStart** 2022 Round H out of **15000+** participants, handle: **\_ritik**
- Secured a Global Rank of **2037** in **Meta Hacker Cup** 2023 Round 1 out of 27000+ participants, handle: **\_ritik**
- Finalists among **50+** qualified teams from **100+** colleges, in **Hackout 2023**, by **Headout** during IIT KGP Kshitij Tech Fest

## SKILLS AND EXPERTISE

**Programming Languages:** (Proficient): C++, Python, Javascript, Typescript, C | (Familiar): Java, Rust, Kotlin, Solidity, C#

**Frameworks/ Libraries:** (Proficient) - Django, Angular, ReactJs, Flask, Spring Boot, STL | (Familiar): NodeJs, NextJs, Flutter, Redux

**Softwares/Tools:** Git, Docker, AWS, Linux, PostgreSQL, MongoDB, DBeaver, Google Collaboratory, Visual Studio Code, Postman, Jupyter

## COURSEWORK INFORMATION

Programming and Data Structures\* | Graph Theory and Algorithms | Applied AI, ML and DL techniques | Probability and Statistics | Linear Algebra and Numerical Analysis | Advanced Calculus | Economics (\* marked courses had laboratory component)

## EXTRA CURRICULAR ACTIVITIES

- Member of the **Gold-winning** Football Team of Rajendra Prasad Hall of Residence in Gymkhana General Championship 2023
- Actively participated in the **Bronze-winning** Illumination Team of RP Hall of Residence for Inter-hall Illumination Competition 2022