

ABHINAV THAKUR

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Education

Indian Institute of Technology Kharagpur

Bachelor and Master of Science in Economics; GPA - 8.24/10

Nov 2021 – May 2026

Kharagpur, India

Internship Experience

Machine Learning Intern | PhysicsWallah

Apr 2024 - Jul 2024

Objective: Prompt compression and evaluation of RAG-based models

Hybrid

- Worked towards improving the efficiency of **Alakh-AI** (AI chatbot) for image-based queries and retrieval tasks
- Worked on prompt compression and built a custom prompting template, reducing overall token costs by 30%
- Integrated open-source frameworks like **Ragas** and **ARES** to improve Alakh-AI's bench-marking for various use cases

Member of Technical Staff Intern | DevRev

Jan 2024 - Mar 24

Objective: Fine-tuning LLMs for domain-specific tasks

Hybrid

- Generated synthetic datasets for **Retrieval-Augmented Generation (RAG)**, fine-tuning and evaluation of LLMs.
- Finetuned code and **instruct-based LLMs** to enhance the model's logical reasoning and tool-use capabilities
- Achieved **results comparable to GPT-4** in smaller open source LLMs, optimizing computational costs and latency

Research Intern | National University of Singapore

Jul 2023 – Dec 2023

Objective: Semantic Analysis to Determine Citizens' Voting Preferences

Remote

- Worked towards analyzing the salience biases of voters and contextualize these biases to form relevant political strategies
- Applied **LDA**, **PLSA**, **BERTopic** and semi-supervised topic modelling on **multilingual survey dataset**
- Analysed the generated topics to calculate salience and developed a method to rank topics based on preference weights

Publications

RTaC: A Generalised Framework for Tooling

May 2024

Objective: LLM optimisation for tooling tasks

Crete, Greece

- Implemented a dual-agent system, generating synthetic query-output pairs and fine-tuned coding-based LLMs for tooling

NovaNet: A Novel Method for Enhanced Pothole Detection

Aug 2024

Objective: Improving upon existing DL methods for pothole detection

Sicily, Italy

- Implemented Multi-Scale Feature Fusion, CoordConv, and adversarial training utilizing the Fast Gradient Sign Method

Relevant Coursework

- | | | |
|----------------------------------|-------------------------------|--------------------------------------|
| • Advanced Calculus | • Algorithms | • Econometric Analysis |
| • Linear Algebra | • Database Systems | • Advanced Microeconomics |
| • Probability and Statistics | • Machine Learning | • Advanced Macroeconomics |
| • Partial Differential Equations | • Natural Language Processing | • Financial Institutions and Markets |

Technical Skills

- **Languages:** Python, C, C++, Java, R, SQL, STATA
- **Libraries and Frameworks:** PyTorch, Tensorflow, LangChain, NumPy, Pandas, Matplotlib, Scikit-learn

Leadership

Kharagpur Data Analytics Group

Jul 2023 – Present

Advisor/Executive Head

IIT Kharagpur

- Conducted several national level hackathons and bootcamps, disseminating AI/ML knowledge throughout India.
- Achieved a 82% YoY participation increase in Kharagpur Data Science Hackathon, with over 5500 unique participants

Acharya Jagadish Chandra Bose Hall of Residence

Jul 2023 – Present

Senate Member/General Secretary Technology

IIT Kharagpur

- Coordinated technology activities of the hall and managed **INR 200,000** in funds for the academic session 2023-24.
- Lead 10 teams of over 100 members across Inter-Hall events such as Biz-Tech Quiz, Case Study and Data Hackathon

Extracurricular

Inter IIT Tech Meet 13.0

Oct 2024 – Dec 2024

Silver - Team Captain - ISRO High Prep Event

IIT Bombay

Inter IIT Tech Meet 12.0

Oct 2023 – Dec 2023

Gold - Team Member - DevRev High Prep Event

IIT Madras

General Championship 2023

Jan 2023

Gold - Math Olympiad

IIT Kharagpur