ANIMESH LOHAR

ACADEMIC DETAILS

Year	Degree / Board	Institute	GPA / Marks(%)
---	M.Tech in Computer Technology	Indian Institute of Technology Delhi	6.17
2024	B.Tech in Information Technology	RCC Institute of Information Technology (Affl. to MAKAUT/WBUT)	8.47
2020	West Bengal Board (WBCHSE)	Rangamati Kironmoyee High School	83.6%
2018	West Bengal Board (WBBSE)	Hoomgarh Chandabila High School	81.7%

PROJECTS

- **Transformer Interpretability (Ongoing M.Tech Thesis under Prof. Sougata Mukherjea)** (Jul, 25 - Present) :
  - Designed **factual vs. counterfactual** prompt experiments; compared open-source (**GPT-2, LLaMA**) vs. closed-source (**GPT-3.5, GPT-4**); **analyzed LLM failure modes in factual recall vs. counterfactual reasoning**.

- **Deep Learning for MRI Reconstruction (Prof. Monika Agrawal)** (May, 25 - Present) :
  - Worked on **India's first govt-developed MRI (AIIMS Delhi & SAMEER)**; built pipeline from **raw K-space → IFFT → MRI**; applied **Fourier Neural Operator** to predict missing datapoints and enhance image quality.

- **Robust Aggregation for Federated Learning (Prof. Harshan Jagadeesh)** (Jan, 25 - May, 25) (Python, > 400 LOC) :
  - Implemented **robust aggregation** against **Byzantine clients**; used **Weiszfeld algorithm** for geometric median; ensured secure **aggregation** & **communication efficiency**; evaluated on **non-IID datasets**.

- **Counterspeech Generation & Factuality Analysis (Prof. Tanmoy Chakraborty)** (Feb, 25 - Present) :
  - Built end-to-end counter-speech system; implemented **n-gram LM, CRF**, and **Transformer-based GEC** from scratch; trained **seq2seq** with attention visualizations; **Factual Analysis in LLM-generated counterspeech** and applied **Inference-Time Intervention** to improve reliability; evaluated via **BLEU/ROUGE/BERT Score** & toxicity reduction.

- **Transformer for Image from scratch (Prof. Sumantra Dutta)** (Mar, 25 - May, 25) (Python, > 600 LOC) :
  - Implemented Transformer from scratch (**patch embedding, multi-head attention, positional encodings**); reduced **attention complexity via Linformer**; introduced **multi-scale patch embeddings**.

- **Reinforcement Learning with Policy Iteration & Value Iteration (Prof. Raunak Bhattacharyya)** (Aug, 25 - Sept, 25) :
  - Applied DP-based RL in **Football Simulation**, **Online Knapsack**, **Portfolio Optimization** environments.

- **Text Summarizer - End to End MLOps Pipeline (Prof. Sougata Mukherjea)** (Mar, 25 - Aug, 25) :
  - Built abstractive **text summarization with Transformers** (**Hugging Face**). Developed full MLOps pipeline with **DVC, MLflow, FastAPI, Docker, CI/CD** for reproducible deployment.

- **Computer Vision - Video Summarization & Background Segmentation (Prof. Sumantra Dutta)** (Jan, 25 - Mar, 25)
  - Implemented **keyframe-based video summarization** using **eigen-analysis**; background subtraction via **GMM**.
- **Enhanced Shell, System Call Controls & Signal Handling in MIT-xv6 os (Prof. Smruti Sarangi)** (Jan, 25 - Apr, 25) :
  - Extended xv6 with **authentication-gated shell**, **syscall block/unblock**, and **new chmod syscall**; implemented signals **SIGINT, SIGBG, SIGFG, SIGCUSTOM** with job control and user handlers.
- **Phishing Detection with Machine Learning (Prof. Sougata Mukherjea)** (Jun, 25 - Jul, 25)
- **Fibonacci Heap Tree from scratch with DMA (Prof. Sumantra Dutta)** (Sept, 24 - Oct, 24) (C++, > 650 LOC)
- **Matrix Inversion (Gaussian elimination method) in RISC-V Assembly (Prof. Smruti Sarangi)** (Sept, 25 - Oct, 25)
- **AES & RSA Cryptography Algorithms (Prof. Harshan Jagadeesh)** (Jan, 25 - May, 25) (Python, > 500 LOC)

QUALIFYING EXAMS

- **Graduate Aptitude Test in Engineering (GATE) Rank:** Data Science & AI paper - 1588 (Score - 537)

TECHNICAL SKILLS

- **Programming**: C++, Python, Java
- **ML/DL Frameworks**: PyTorch, TensorFlow, Scikit-learn, Hugging Face, LangChain, Ragas, YOLO, OpenAI Gym
- **MLOps & DevOps**: FastAPI, Pydantic, Docker, MLflow, DVC, Airflow, CI/CD, DAGsHub, LLMOps, ETL pipelines
- **Tools & Platforms**: Git, VSCode, Jupyter, Gephi, LaTeX
- **Relevant Courseworks**: Data Structures & Algorithms, DBMS, Operating Systems, OOP, SQL, MongoDB, Web-Technology, Machine Learning, Deep Learning, Reinforcement Learning, Computer Vision, NLP & LLMs

Disclaimer: All the information on this page is entered by student.

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IIT COURSE

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M.Tech in Computer Technology	Indian Institute of Technology Delhi	6.17

COURSES DONE

Mathematical Foundations Of Co, Software Fundamentals For Comp, Special Topics In Computers 1, Introduction To Machine Learning, Operating Systems, Deep Learning For Natural Language Processing, Minor Project, Network Security