

EDUCATION

Degree/Certificate	Institute/Board	CGPA/Percentage	Year
B.Tech. + M.Tech.	Indian Institute of Technology, Kharagpur	8.71 (Current)	2020-Present
Senior Secondary	Little Flower School, ISC Board	96.25%	2020
Secondary	Little Flower School, ICSE Board	95.40%	2018

EXPERIENCE

- Workflow Automation | Sprinklr, India

May '24 - Jul '24

Objective: Develop tools to create a flowchart from a query and to summarize a flowchart

Gurugram, India

– Ensured **structured output generation** from LLMs by creating a **Pydantic** based class definition which captures the flowchart’s structure

– Utilized **prompt engineering** and **OpenAI function calling API** through Instructor package to generate flowcharts from queries

– Deployed the tools using **Tornado** and **Docker**, empowering the product team to reduce flowchart creation time by over **60%**
- Maternal & Child Health Monitoring | Stanford University | Prof. Pascal Geldsetzer

May '23 - Aug '23

Objective: Estimate key indicators of health status in low income countries using satellite imagery

Remote

– Trained a **random forest regressor** for **multi-output regression** using **11000 numerical features** and performed **K-Fold Cross Validation**

– Utilized the **Dask** distributed database package to load an **8GB dataset** and perform **out-of-memory preprocessing** and **cleaning**

– Selected to participate in a **Kaggle competition** hosted by **Stanford University**, finishing at **first position** out of 30+ teams
- Semantic Segmentation of Remote Sensing Images | ISRO | Dr. Debasish Chakraborty

Apr '22 - Dec '22

Objective: Develop an efficient and performant CNN model to be trained on small datasets

Remote

– Built an encoder-decoder based network with **depth-wise separable convolutional layers** which **outperforms** a **standard U-Net** model

– Utilized a novel **Unified Focal Loss function**, which works well with class imbalanced datasets like the training dataset, **LandCover.AI**

– Developed **TensorFlow** scripts to **create a dataloader** for an **efficient input pipeline** and to perform **inference** on **variable-sized** images

PROJECTS

- Hospital Management System | Database Management Systems Lab

Feb '23 - Mar '23

Objective: To design a web application for a hospital management system

– Developed a **python flask** based web application to connect a **MySQL** database to a **bootstrap front-end** coupled with **jinja templates**

– Implemented **user session management** using **flask-login** and provided **access control** through **python decorator functions**

– Modelled entities in a real-life hospital using a **relational database** and its **schema** with support for querying & storage of patient data
- Message Oriented TCP | Computer Networks Lab

Feb '23 - Mar '23

Objective: To build a message oriented TCP Protocol using socket programming

– Created a library for ‘MyTCP’ protocol, guaranteeing **reliable, in-order** delivery of **messages** up to **5000 bytes** using standard TCP sockets

– Utilized **POSIX threads** and **mutex locks/conditional signals** to ensure **synchronised access** to global buffers used for messages

– Ensured that all **global data structures** were cleared on closure of socket and performed tests using simple **client/server programs**
- Linux Shell Development | Operating Systems Lab

Jan '23 - Feb '23

Objective: To create a shell that will run as an application program on top of the Linux kernel

– Effectively managed **process groups** and employed **signal handlers** to monitor child processes and ensure **synchronized execution**

– Designed a CPU usage heuristic to detect **fork bomb** based **malware** and utilized the **flock syscall** to ensure **exclusive access** to files

– Implemented advanced features including **background execution, pipelining, wildcard handling, and command history navigation**
- DevRev High Prep: Reimagining Tooling as Coding | Inter-IIT Tech Meet 12.0 (IIT Madras)

Nov '23 - Dec '23

Objective: Create an efficient tool-use LLM which matches closed-source LLMs in performance

– Secured **solo gold** for proposing **RTaC** pipeline for tool usage, achieving **competitive performance** with **GPT-4** under the same framework

– Employed **PEFT** and **LoRA** to fine-tune coding LLMs like **DeepSeek** and **Code Llama**, replacing tools with function calls, reducing costs by **30%**

– **Created synthetic datasets** for tooling scenarios, including **dynamic tooling**, mathematical, conditional and iterative tooling

TECHNICAL SKILLS

- **Languages:** C/C++, Python, LaTeX, MySQL, Bash, MIPS, Assembly
- **Libraries/Frameworks:** Keras, Tensorflow, NumPy, Pandas, Flask, scikit-learn, Git, C++ STL, C pthreads
- **Skills:** Systems Programming, Socket Programming, Data Science, Object Oriented Design

COURSEWORK

- **Theory + Lab:** Operating Systems, Computer Networks, Database Management Systems, Computer Organisation & Architecture, Compilers, Software Engineering, Programming & Data Structures, Algorithms-I
- **Theory:** Deep Learning, Machine Learning, Probability & Statistics, Statistical Inference, Discrete Structures, Linear Algebra, Calculus

ACHIEVEMENTS

- **Specialist**, at Codeforces, having a peak rating of **1547** on the portal with the handle **rv4102**
- **Attendee**, Optiver Winter School conducted by IIT Delhi *Jan '23*
- **All India Rank 473**, JEE Advanced, 2020 amongst 2+ lakh shortlisted candidates *Sep '20*
- **All India Rank 1176**, JEE Main, 2020 amongst 10+ lakh candidates *Jan '20*

POSITIONS OF RESPONSIBILITY

- **Associate Member**, Business Club, IIT Kharagpur *Dec '20 - Sep '21*
 - Authored a **Whitepaper on XGBoost** 🏆.
 - Conducted a webinar on Cryptocurrency with Dr. Akshat Shrivastava as the guest lecturer.
- **SWG Mentor**, Students' Welfare Group, IIT Kharagpur, Kharagpur *Dec '22 - Present*
 - Mentoring three juniors on various academic and non-academic activities and how to work towards achieving their goals