

# AAHLAAD MANTRAVADI

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## EDUCATION

### International Institute of Information Technology, Naya Raipur

GPA: 8.41/10

Bachelor of Technology, Computer Science and Engineering

Dec. 2021 – June 2025

**Relevant Coursework:** Software Engineering, Deep Learning, Operating Systems, Database Management Systems

## WORK EXPERIENCE

### Software Developer Intern

Feb 2025 – July 2025

RCI, Defense Research and Development Organisation

Hyderabad, Telangana, India

- Led development of a **Graphical User Interface** for simulating On-Board Computers in **Avionics Systems**. The software supports multiple communication protocols with error handling for lossless data transmission.
- Built in **C** with **Windows API** for interfacing with hardware and **OpenGL** for real-time data visualization. Designed a **multithreaded** architecture to boost responsiveness and throughput, delivering **60%** improvement.

### Developer Intern

May 2024 – July 2024

RCTS, IIT-Hyderabad

Hyderabad, Telangana, India

- Developed an **Action Recognition** model to recognize students' actions such as reading, writing, and sleeping in classroom video feeds, while addressing low resolution and obfuscation using **Masked Video Distillation**.
- Participated in creation of a **custom dataset** for 15 behaviors across different classroom settings, enabling fine-tuning of the AI model for real-time tracking, individual behavior detection, and group activity analysis.

## PROJECTS

### Unified Messaging Gateway | JavaScript, Node.js, TCP, HTTP

- Built a TCP **echo server** using Node.js sockets with **async/await** and **promises** for async I/O, byte streams, and buffers, along with an HTTP server generating dynamic content via asynchronous **generators**.
- Created a static **file server** with range request support, caching, and compression using stream and pipe abstractions, integrating **WebSocket** communication with message-based design and blocking queues.

### Custom Linux Debugger | C++, Linux, ptrace, ELF, DWARF

- Implemented a lightweight **debugger** core in C++ on Linux using **ptrace** for process control, enabling dynamic **breakpoint** management, single-step execution, and signal handling with minimal performance impact.
- Designed **ELF/DWARF** parsers for source-level debugging which enabled precise stepping, call-stack **backtraces**, and live inspection of variables and registers while using a **Makefile** for the build process.

### Simple Blockchain Prototype | Python, Flask, REST API

- Built a working **blockchain** in Python that stores transactions in a pending queue in memory. Constructs new timestamped blocks linked by hashes, using a **Proof-of-Work** algorithm to mine continuous new blocks.
- Set up an HTTP server with **Flask** providing **JSON** endpoints to submit transactions, trigger mine, retrieve the full chain, register peer node URLs, and resolve chain conflicts by replacing shorter chains automatically.

### C++ Neural Networks | C++, CUDA

- Built a **Neural Networks framework** in C++ using explicit matrix multiplications. Implemented Forward Pass, Backpropagation, Activation Functions, Optimizers, Convolution, Pooling and K-Fold Cross Validation.
- **Parallelized** training on **GPU** architecture using **CUDA** and achieved 83.6% accuracy on CIFAR-10, matching the performance metrics of Tensorflow implementation using the same model architecture.

## SKILLS

- **Languages:** C++, Python, JavaScript
- **DevOps:** Linux, Windows, Git, Docker, SQL, Make
- **Frameworks and Tools:** Windows API, Node.js, CUDA, REST API, Tensorflow, MySQL, NoSQL

## EXTRACURRICULAR EXPERIENCE

- Achieved a rank of 847 out of 1,23,967 candidates in Computer Science & Information Technology in GATE 2024.
- Acted as Student Head of Institute's Innovation Council (*December 2023 to May 2024*).
- Acted as the Vice President of the Ciphercell club (*May 2022 to May 2023*).
- Classic Carnatic vocalist for more than 10 years and performed at multiple events broadcast live on television.