Tegan Jain

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Education

Indian Institute of Technology Kharagpur   Kharagpur, India
Integrated M.Tech. Computer Science and Engineering (CGPA: 9.24/10)   *2023 – 2028 (Expected)*

Work Experience

Arcane Build | *Frontend Intern*   *Jan 2025 - Feb 2025*

- Contributed **7,186 lines of code** and **116 commits** in a single month to build a modern, responsive UI for Daao.ai
- Delivered responsive interfaces using Next.js, TailwindCSS, and shadcn/ui while working closely with the design team
- Implemented versatile routing with Next.js middleware for handling multiple subdomains within the DAO platform
- Collaborated with a cross-functional team to ship features fast, iterating rapidly in a fast-paced startup environment

Projects

ppGB: Gameboy Emulator - Professor Jibesh Patra   *Feb 2024 - Present*

- Emulated the Nintendo Gameboy architecture with an accurate Sharp SM83 CPU (GBz80) implementing **501** opcodes
- Designed modular core components for the processor, memory, and graphics using **robust C++ class abstractions**
- Closely emulated the intricate rendering process of the pixel processor, handling sprite access, background scrolling, window overlay, tile splicing, sprite and background priority and more in the clock-cycle accurate Pixel FIFO Fetcher
- Leveraged SDL2 for cross-platform graphics, ensured software quality through comprehensive unit tests and profiling
- Reduced testing time by **73%** by migrating to Catch2 v3 and optimizing the build. Received a full grade for the course

Godown Viewer   *Oct 2024*

- Created a **full-stack web application** that visualizes hierarchical tree data structures for warehouse inventory
- Containerized frontend (React/Typescript) and backend (ExpressJS) using Docker for reproducible seamless deployment
- Deployed the application stack to an AWS EC2 instance, reduced server load by creating images with DockerHub
- Configure a Nginx server as a reverse proxy to serve static files and efficiently route API requests to the backend

Competitions

BITSCTF 2025 - Capture The Flag Competition   *Feb 2025*

- Led a team of 6 members to achieve **26th out of 850** teams in a global Capture the Flag **cybersecurity** competition
- Ranked **5th** among Indian teams, and was responsible for **50%** of the total points scored across multiple categories
- **Reverse engineered** Python bytecode and exploited the random module in a challenge solution with only 50 solves
- Analyzed forensic artifacts on disk images to discover and reverse engineer malicious Visual Studio Code extensions

Inter IIT Tech Meet 13.0   *Dec 2024*

- Member of Gold winning team for Singular Brain for a Robot Swarm by BharatForge during InterIIT Tech Meet 13.0
- Solved the problem of **visualizing MVsim & RViz** Swarn simulations with interactive chatbot on **headless servers**
- Utilised **Virtual Network Computing (VNC) & Virtual Framebuffers** to dockerise and integrate the pipeline

Smart India Hackathon (SIH) 2024   *Dec 2024*

- Selected in the **top 5 teams nationally** for the problem Recovery of Deleted Data in XFS and BTRFS Filesystems
- Utilized filesystem APIs and open-source tools and digital forensics methods like file carving for deleted file recovery
- Created a bash script to enter a directory and generate reports on recovered files, verifying file integrity and metadata

Technical Skills

Programming Languages	C/C++, Javascript, Typescript, Bash, Python
Frameworks & Databases	Next.js, React.js, ExpressJS, Svelte, Astro, Hugo, Node.js, Flask, SQLite, Supabase
Tools & Platforms	Wireshark, radare2, Git/GitHub, Docker, Nginx, AWS EC2, AWS Lambda, Linux

Positions of Responsibility

Kharagpur Open Source Society | *Executive Head*   *May 2024 - Current*

- Created challenges for and hosted KOSS CTF 2025, a cybersecurity competition to introduce students to CTFs
- Organized hands-on workshops to familiarize students with Digital Forensics, Git, Reverse Engineering and Linux.
- Conducted Kharagpur Winter of Code (KWoC), a month-long event with 1000+ participants and 30+ projects.