

SHANTANU KHARWAR

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Education

Indian Institute of Information Technology, Jabalpur

B.Tech in Computer Science and Engineering

Aug. 2024 – Present

Expected May 2028

Kendriya Vidyalaya, IIT Kanpur

CBSE Class XII - 90.2%

May 2024

Kanpur, Uttar Pradesh

Experience

Summer Intern – Post-Quantum Cryptography

May 2025 – June 2025

Indian Institute of Technology Kanpur

[Letter of Certification](#)

- Implemented and benchmarked **5 NIST PQC algorithms** (Kyber, Mayo, PQOV, HQC, SQIsign) on ARM-FPGA platforms using AMD Vitis.
- Optimized **5,000+ lines of C/C++** cryptographic code for ARM Cortex-A9, resolving memory alignment and hardware compilation issues.
- Validated correctness using **NIST KAT (Known Answer Test)** files with multiple test vectors per algorithm; used **AMD Vitis** to cross-compile and debug on FPGA boards.

Open Source Contributions

stdlib-js/stdlib | C, C++, Fortran, JavaScript

[Github](#)

- PR #9822**: Implemented **single-precision sincosdf** via C math bindings; passed full CI/CD, linting, and static analysis.
- PR #9849**: Extended **BLAS** with complex Givens rotation bindings across C, Fortran, and JavaScript.

Peersky Browser | JavaScript, Electron, Node.js

[Github](#)

- PR #148**: Fixed race condition in IPC handler registration via **lazy getter**; added toast notification.
- PR #152**: Created a **one-click bookmark shortcut** on browser home page; addressed maintainer CSS feedback to reach merge.

Technical Skills

Languages: JavaScript, C, C++, HTML, CSS, Java, Rust, Python, Solidity

Frameworks & Cloud: React, Node.js, Electron, FastAPI, REST APIs, Google Cloud Functions

Tools: Linux, Git, Docker, MongoDB, SQL, Redis, AMD Vitis, PYNQ FPGA

Projects

Udte-Bhawre | Electron, Node.js, MongoDB, Gemini API, MCP

[Github](#)

- Developed a cross-platform desktop AI assistant using **Electron** and **Node.js**, featuring interactive taskbar AI companions and a centralized dashboard for agent management.
- Architected an AI integration layer using the **Google Gemini API** and **Model Context Protocol (MCP)** for secure tool execution and multi-terminal sessions, backed by **MongoDB**.

MessChain 2.0 | Solidity, Hyperledger Besu, Node.js, React, PostgreSQL, IPFS

[Github](#)

- Built a blockchain-based hostel mess subscription, rebate, and voting system on a private **Hyperledger Besu (QBFT)** network, with **Solidity** contracts (Hardhat Ignition) for ERC20 tokens, governance, rebates, a timelock, and tender rates.
- Developed a **Node.js/Express** backend (Ethers.js, Prisma, PostgreSQL) with **IPFS** storage, encrypted user wallets, and role-based **React** dashboards for Admin, Student, and Staff; a midnight cron job automates daily meal charges, rebates, and mess changes.

PathOS | Gemma 4, Ollama, llama.cpp, GGUF, GRPO, Docker

[Github](#)

- Co-built an **offline AI diagnostic assistant** for H&E histopathology that runs on a laptop with no GPU via **Ollama**; fine-tuned **Gemma 4 E2B** with SFT on **19.5K** examples followed by **GRPO**.
- Packaged as quantized **GGUF** models (Q8_0 and 4-bit Q4_K_M) for **llama.cpp** and Ollama, with constrained decoding for structured answers and agentic multi-paragraph pathology reports.

Achievements

- Winner of the **Ollama special track** at the **Gemma 4 Good Hackathon**, organized by **Kaggle** and **Google DeepMind**
- 2nd place** overall and winner of the Armour IQ sponsored track at MLH Hackbyte 4.0
- Solved **300+** algorithmic problems in competitive programming
- CodeChef**: 1549 (2-Star) | **Codeforces**: 1242 (Pupil) | **Leetcode**: 1,510