Prakhar Dwivedi

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SUMMARY

Electronics & Communication Engineering student with a focus on Backend Systems and Network Security. Experienced in building high-performance web applications using Next.js, Python (FastAPI), Docker, and React.

EDUCATION

IIIT Bhopal   B.Tech, Electronics & Communication Engineering, **CPI: 8.74**
Nov 2023 – June 2027, Coursework: DSA, OOP, DBMS, CN, Systems

EXPERIENCE

Offensive Security Lead | XPLOIT Club, IIIT Bhopal   **LinkedIn| Sep 2025 – Present**
- Conducted network vulnerability assessments and packet analysis using Kali Linux, Nmap, and Wireshark.
- Organized campus-wide CTF with 100+ participants. Conducting weekly workshops on web exploitation and cryptography.

IIIT Bhopal | Teaching Assistant - Digital Logic Design   **LinkedIn| Feb 2025 – May 2025**
- Selected based on academic excellence to assist faculty with evaluation and peer mentorship for a batch of 60+ students.
- Technical Verification: Verified accuracy of student circuit designs, Logic Gate implementations, and Circuit Designs.

PROJECTS

PanditAI (2026)
Next.js, Python (FastAPI), Socket.IO (WebSockets), Redis, MongoDB, Docker   Live Site . GitHub
- Built and deployed a full-stack AI application using **FastAPI** and **Next.js**, integrating astronomical computations, knowledge-graph reasoning (**Neo4j**), and LLM-based natural language generation
- Tested and benchmarked the deployed backend, observing **~5.4s cold-start latency** and **~2.2s median warm-request latency**, with **~60% performance improvement** after cache warm-up
- Optimized **Docker** builds by removing GPU dependencies, reducing backend image size by **~700MB** and improving deployment reliability on managed cloud infrastructure
- Implemented strict API contracts using **Pydantic** to ensure type safety across microservices

eVakeel (2025)
Python (FastAPI), Node.js, React, REST APIs, WebSockets, Docker   Live Site . GitHub
- Designed a **Dual-Backend system** separating I/O-heavy operations **(Node.js)** from compute-intensive ML tasks **(Python)**, ensuring high throughput under load
- Built a **production-grade legal document QA system** over **~63 high-density legal chunks (Acts)**, integrating **InLegalBERT** for semantic retrieval and achieving **~50ms warm-start query latency** under steady-state conditions
- Containerized the microservices stack using **Docker Compose**, configuring **Nginx** as a **reverse proxy** to manage traffic flow and ensure consistent environments between development and production

RESEARCH INTEREST

Quantum Face Id Security (NQM) | Research Proposal   **Under Supervision of Dr. Rahul Chaurasia | IIIT Bhopal**
- **Hybrid Architecture:** Proposed a theoretical framework combining Classical AI (MTCNN, FaceNet) for feature extraction with Quantum Mechanics for tamper-proof storage
- **Quantum Encoding:** Designed a model to map 128-dimensional facial embeddings into quantum states using Amplitude Encoding, optimizing qubit usage (~7 qubits for 128d vectors)

ACHIEVEMENTS

- **Ranked 1st** in the **ECE department** with a **9.32 SGPA** in **Semester 3**, demonstrating consistent academic excellence
- **1799** LeetCode & **1614** CodeChef (3★); solved **250**+ DSA problems across **LeetCode**, **CodeChef** and **GeeksForGeeks**
- Achieved **top 12K rank among 262K** participants in **Adobe India Hackathon 2025,** placing in the **top 5% nationally**
- Directed **3+** peer sessions as **Teaching Assistant** for **Digital Logic Design**

SKILLS

- **Languages**: C, C++, Python, TypeScript, JavaScript, SQL
- **Frameworks & Libraries**: React, Next.js, Node.js, Fastify, Prisma, NextAuth.js, Tailwind CSS, Framer Motion
- **Databases**: PostgreSQL, MySQL, SQLite
- **Systems & Networking:** Docker, Linux (Bash/Kali), TCP/IP, Cisco Packet Tracer, Wireshark.
- **Concepts**: Data Structures & Algorithms, REST APIs, Authentication, Database Design