

AADITYA RAI

Software Engineer & Cybersecurity Researcher

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SUMMARY

Software engineer and cybersecurity researcher who builds full-stack applications, security tooling, and low-level systems. Core work spans TypeScript/React web platforms, Python-based security and scientific tools, and OS development in C and Assembly. Designed and shipped a live billing platform with real users, built OSINT reconnaissance tooling for security research, and is currently developing an operating system from scratch. Delivers end-to-end — from architecture to deployment — independently.

TECHNICAL PROJECTS

CloudVitta — Usage-Based Billing Platform

React 18 | Vite | Tailwind CSS | Node.js | Express | Prisma 6 | PostgreSQL (Neon) | Razorpay | OCI Object Storage

- Built a usage-based billing platform for object storage that tracks consumption and automates invoicing based on actual usage
- Full-stack architecture: React SPA, Express REST API, Prisma ORM with PostgreSQL, OCI Object Storage, Razorpay payment gateway
- Solved OCI metering as the primary technical challenge. Deployed solo, live at cloudvitta.in with real users

SOMA — Subsurface Observation and Mission Architecture

Python | FastAPI | NumPy | SciPy | Scikit-learn | Rasterio | GDAL | GeoPandas | NetworkX | Docker

- Lunar mission-planning platform (hackathon) processing real Chandrayaan-2 datasets (DFSAR radar, OHRC imagery, DEMs)
- Radar polarimetric analysis (CPR/DOP), ice detection via multi-layer data fusion, terrain characterization, landing site evaluation
- A*/Dijkstra rover traverse planning on cost-weighted terrain; FastAPI backend, TiTiler tile serving, Docker Compose

osint-PhantomTrace — OSINT Reconnaissance Tool

Python | aiohttp | Jinja2 | HavelBeenPwned API | python-whois

- Python OSINT tool aggregating public data across 38 platforms with async HTTP requests and per-platform detection to reduce false positives
- Five modules: username enumeration, email breach lookup (HIBP v3), WHOIS, EXIF metadata extraction, Google dork generation
- Self-contained dark-themed HTML reports; modular CLI. [GitHub: github.com/nomadrai/osint-PhantomTrace](https://github.com/nomadrai/osint-PhantomTrace)

LarpOS — Operating System from Scratch

C | x86 Assembly

- Custom OS from scratch: virtual memory, paging/segmentation, file system, system calls, I/O management, device drivers

VisionCommand — Gesture-Based OS Control

Python | OpenCV | MediaPipe | Vosk

- Real-time gesture and voice OS control using MediaPipe hand tracking (21 landmarks) and Vosk speech recognition
- [GitHub: github.com/nomadrai/VisionCommand](https://github.com/nomadrai/VisionCommand)

TEJAS — Solar Flare Forecasting Platform

Python | Machine Learning

- AI-powered solar flare nowcasting using SoLEXS/HEL10S X-ray data from ISRO's Aditya-L1 mission; model-training stage

Portfolio — aadityarai.dev

Next.js 16 | TypeScript | Tailwind CSS v4 | Framer Motion | OpenRouter API

- Canvas2D animated background, interactive terminal, ORION RAG AI assistant with streaming, keyword retrieval, rate limiting. Vercel CI/CD

SKILLS

Languages: TypeScript, Python, C, C++, Go, Assembly

Frontend: React, Next.js, Tailwind CSS, Framer Motion

Backend: Node.js, Express, FastAPI, Prisma, PostgreSQL, REST API design

Cybersecurity: Linux hardening, Nmap, Wireshark, Burp Suite, OWASP Top 10, web exploitation, forensics

Systems / OS: Virtual memory, paging, file systems, system calls, I/O management, device drivers, computer architecture

Scientific: NumPy, SciPy, Pandas, Scikit-learn, Rasterio, GDAL, GeoPandas

Tooling: Git, Bash, Docker, Docker Compose, Vercel

INTERNSHIP

Ethical Hacking & Cybersecurity Intern — VaultofCodes (2026, 2 months)

- Hands-on ethical hacking and cybersecurity research internship

CERTIFICATIONS

- Introduction to Cybersecurity — Cisco Networking Academy (2025)

EDUCATION

B.Tech, Computer Science & Engineering (IoT)

Yeshwantrao Chavan College of Engineering (YCCE), Nagpur — 2024–2028 (expected)

Higher Secondary Certificate (PCM)

B.K. Birla College, Kalyan — 2022–2024

CYBERSECURITY RESEARCH

- Active in CTF competitions since 2024 covering web exploitation, forensics, and reverse engineering; writeups at github.com/nomadrai/ctf-writeups
- Building a C2 (command-and-control) simulation in Python for studying attacker infrastructure in controlled lab environments
- Cybersecurity study notes and resources at github.com/nomadrai/cybersecurity-resources
- Domains under active study: Linux systems/hardening, network security (TCP/IP, packet analysis), web security (OWASP Top 10, injection, XSS), cryptography (AES, RSA, TLS)

HACKATHONS & LEADERSHIP

- Participated in multiple hackathons with several wins
- Co-Head of Sports, Compufest 2026 — YCCE's annual techfest

LINKS

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