



ARYAN SINGH CHANDEL

Backend Engineer & Systems Architect

CONTACT

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github.com/shiroonigami23-ui
Interactive Portfolio

SKILLS

Languages

C++ Python Golang

Full-Stack Dev

PHP 8.2 JS ES6+ AJAX
Flask Streamlit

Systems

Linux Memory Mgmt
Concurrency

Backend & DB

ACID CSRF Protection
Session Guarding API Design

AI / ML

PyTorch JAX CNN
Model Optimisation SHAP

Tools

Git GitHub Cloud Hosting

EDUCATION

B.Tech — CSE

RJIT, BSF Academy
Gwalior, MP
2023 – 2027

ABOUT ME

Backend Engineer and Systems Architect who builds secure, high-integrity infrastructure from first principles — from ACID-compliant transaction engines to concurrent backend architectures hardened against real-world failure modes. On the research side, I optimise PyTorch internals for leaner CPU inference, am extending that work into JAX for high-performance ML pipelines, and am developing a parameter-efficient CNN architecture for edge deployment. My research on FAANG interview strategies for non-IIT students combines applied ML (SHAP, classifier ensembles) with mentorship at scale. Currently serving as a Teaching Assistant for CMU's Interactive Deep Learning (IDL) course, AI/ML Research Dept, Fall 2026.

WORK EXPERIENCE

Teaching Assistant — IDL Course

Carnegie Mellon University, Pittsburgh | AI/ML Research Department
Fall 2026 (Ongoing)

- Serving as TA for the Interactive Deep Learning (IDL) course at CMU's AI/ML Research department.
- Supporting instruction, student mentorship, and applied research activities on Pittsburgh campus.

Open-Source & Independent Project Developer

Self-Directed | Remote

2023 – Present

- Shipped production-grade projects spanning full-stack systems, security-hardened backends, and cross-platform tooling.
- Conducted AI/ML research: optimised PyTorch to build a faster, leaner variant; exploring JAX for high-performance research workloads; authored paper on FAANG interview strategies for non-IIT students.

RESEARCH & AI/ML WORK

PyTorch Optimisation — Custom Faster Build

Python, C++, PyTorch Internals, CUDA-aware Optimisation

2025 – Ongoing

- Profiled and optimised PyTorch core internals to produce a leaner, faster variant with reduced memory overhead.
- Identified bottlenecks in autograd and dispatcher layers; restructured computation graphs for improved throughput.
- Benchmarked against vanilla PyTorch — achieved measurable inference speedup on CPU-bound workloads.

JAX Research — High-Performance ML Systems

Python, JAX, XLA, Distributed Training

2026 – Ongoing

- Exploring JAX and XLA-compiled workflows as a faster alternative path for research-scale ML training.
- Evaluating JAX's functional transformation model (grad, vmap, jit) against existing PyTorch pipelines.

Lightweight CNN Architecture Research

Python, PyTorch, Deep Learning, Model Compression

Ongoing

- Researching architectural changes to reduce CNN parameter count while preserving accuracy benchmarks.
- Exploring depthwise separable convolutions and structured pruning to target edge-deployment use cases.

Research Paper — FAANG Interview Clearing for Non-IIT Students

Data Analysis, SHAP, ML Classifiers, Academic Research

2025

- Authored research paper analysing patterns and strategies for tier-3 college students clearing FAANG-level interviews.
- Built synthetic dataset + ML pipeline (5 classifiers, SHAP analysis, SMOTE) to predict placement outcomes.
- Integrated Claude API-powered 90-day personalised roadmap generator as a practical output of the research.

PROFESSIONAL PROJECTS

CAMS

PHP 8.2, MySQL, AJAX, Security Hardening, Concurrency Control

Dec 2025

- Architected full-stack moderation system with Atomic Transactions and FOR UPDATE row-locking for concurrent integrity.
- Engineered centralised Security Engine for CSRF validation and session auth — SQL injection surface reduced to zero.
- Built real-time Audit Log Terminal achieving 100% administrative accountability.

Automata Studio — Android / Web JFLAP Edition

JavaScript ES6+, HTML5, Automata Theory, Cross-Platform

Ongoing

- Built mobile-optimised DFA / NFA studio with interactive simulation and zero-dependency ES6+ runtime.
- Ported JFLAP core to cross-platform web, improving load performance across Android and desktop.

NOTABLE ACHIEVEMENTS

◆ **CMU Teaching Assistant** — Fall 2026, IDL Course, AI/ML Research Dept, Carnegie Mellon University.

◆ **FAANG Research Paper** — ML-backed research on interview clearing for non-IIT / tier-3 students.

◆ **PyTorch Optimisation** — Faster, optimised variant with measurable CPU inference speedup.

◆ **Maths Olympiad Gold Medalist** — National-level logical reasoning & algorithmic problem-solving.