

Lakshya Pachisia

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Education

PES University

2023 – 2027

B.Tech in Computer Science Engineering | CGPA: **9.09 / 10** | CNR Rao Scholarship, Top 20% of batch in 5 semesters

Experience

Visa Inc.

June 2026 – Aug 2026

Software Development Intern | Python, PySpark, LangGraph, LLM APIs, Trino, sqlglot

- Built **SENTINEL**, a **6-agent** GenAI system that automatically converts Jira stories into production-ready PySpark validation scripts, reducing manual development effort from 1 day to minutes.
- Built a schema-grounded routing layer that mapped Jira stories across 7 enterprise data domains, eliminating hallucinated column references during code generation using live schemas spanning **135+** columns per domain.
- Decoupled business-rule validation from LLM code generation by extracting structured configurations from Jira stories, ensuring deterministic PySpark output for critical validations.
- Expanded validation coverage to 18 modular validation patterns and improved reliability through static analysis and AST-based code repair, extending an internal prototype into a multi-agent pipeline with a React/FastAPI review interface.

Mstack Chemicals

May 2025 – August 2025

Backend Intern | FastAPI, PostgreSQL, SQLAlchemy, Pydantic, Supabase

- Migrated a chemical procurement platform off Supabase by designing and owning a FastAPI microservice from scratch, delivering **156 REST API endpoints** across **25+ PostgreSQL data models**.
- Replaced ad-hoc state logic with formal state-machine workflows governing the full lifecycle of enquiries, quotations, and sample requests across sales and procurement modules.
- Enforced RBAC at every state transition and implemented feature flagging to enable a controlled, phased migration from the legacy Supabase backend to the new service.

NDGCS

June 2024 – Oct 2024

App Developer Intern | Flutter, Firebase, Figma, Google Calendar API

- Designed and developed a role-based HR management app (proHCMS) with **5 role-specific dashboards** from scratch in Figma, then implemented the full Flutter frontend with Firebase auth.
- Shipped the app to production with Google Calendar integration for automated interview scheduling across recruiter and candidate roles.

Projects

LAKV – Adaptive KV Cache Compression for Multi-Agent LLM Systems

Python, PyTorch,

HuggingFace, bitsandbytes

- Built a training-free compression framework for Qwen2.5-7B-Instruct that scores each transformer layer via Attention Importance, Offset Variance, and Effective Rank, applying tier-based INT8/INT4/drop quantization to achieve **2.81× KV cache compression**.
- Diagnosed a significant accuracy-compression tradeoff at aggressive quantization tiers – INT4 collapsing to 0% GSM8K accuracy from per-tensor outlier clipping – motivating an offset-correction mechanism to recover fidelity in compressed reasoning states passed across sequential multi-agent pipelines.

AlpacaDB – Relational DBMS

Python, B-Tree, Volcano Model, SQL Parsing

- Built a relational DBMS from scratch with SQL parsing, cost-based query optimization, and persistent page-based storage executed through a **Volcano-style** iterator engine.
- Implemented **B-Tree** indexing with support for range scans, enabling efficient query execution over large on-disk datasets without full table scans.

Logickos – Deterministic LLM Reasoning Verifier

Python, NetworkX, Flask

- Replaced LLM-as-a-Judge with a deterministic verifier that decomposes reasoning traces into a DAG and audits logical structure using graph-theoretic algorithms, outputting a Reasoning Consistency Score ($RCS \in [0,1]$).
- Evaluated on GSM8K, StrategyQA, and ARC; released as an open-source Python library.

- **AI Navigation Aid for the Visually Impaired**

Python, YOLOv8, MiDaS, OpenCV

- Built a real-time navigation assistant fusing YOLOv8 object detection with MiDaS monocular depth estimation to infer object proximity and lateral position from a single camera frame.
- Converted scene understanding into spatial audio cues with directional guidance, enabling navigation without visual feedback.

Skills

Languages: Python, Java, C, JavaScript, SQL, Dart

AI/ML: PyTorch, HuggingFace Transformers, LangGraph, LLM APIs, YOLOv8, MiDaS, Embeddings

Frameworks: FastAPI, Flask, Spring Boot, Flutter

Databases: PostgreSQL, MySQL, MongoDB

Distributed Systems: PySpark, Apache Kafka, Trino, sqlglot

DevOps: Docker, Kubernetes, GitHub Actions, Firebase, Git

Leadership & Achievements

Leadership: Deputy Head, Shunya (PES Math Club); Operations Head, TAMS'24

Achievements: CNR Rao Scholarship (Top 20% of branch, 5 consecutive semesters); 2nd Place, Inferentia; 2nd Place, AppGenesis; Participant in Build India Hackathon 2026 (Anthropic x Replit x Lightspeed)