PALLAVI SINHA

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EDUCATION

- **Guru Gobind Singh Indraprastha University** *CGPA: 8.64*
  B.Tech in Electronics and Communications, Minor in Machine Learning and Data Analytics 2021-2025

EXPERIENCE

- **National Informatics Centre [⊕]** *Jul 2024-Oct 2024*
  Intern New Delhi
  ◦ Engineered a local development environment using Docker & Docker Compose, provisioning frontend,API, and MongoDB containers to streamline internal testing and reduce environment setup time from 15 minutes to less than 2 minutes.
  ◦ Redesigned the eShram CMS user interface using React.js and TailwindCSS, transforming a legacy PHP-based frontend into a responsive, mobile-first single-page application prototype (proof-of-concept).

PROJECTS

- **Nexus: Distributed Job Processing System** [⊕]
  Node.js, Redis, BullMQ, Docker, MySQL, Cloudinary, SSE, EJS, TailwindCSS [◯]
  ◦ Built distributed job queue handling file uploads asynchronously using BullMQ and Redis, processing jobs across multiple workers with automatic retry logic and fault tolerance.
  ◦ Implemented real-time job status updates using Server-Sent Events, deployed containerized architecture with Docker Compose (separate API and worker services), and persisted job state in MySQL with retry tracking and failure handling.

- **BlogFlow: Full-Stack Blogging Platform** [⊕]
  Node.js, Express, MongoDB, Redis, JWT, Cloudinary, BCrypt, EJS, Postman, Mocha [◯]
  ◦ Architected RESTful API serving 20+ concurrent users with JWT authentication, bcrypt password hashing, and Redis session caching, maintaining sub-200ms average response times.
  ◦ Optimized API performance by implementing Redis caching layer on high-traffic routes (user sessions, blog listings), reducing database queries by 60% and average latency from 450ms to 70ms (84% improvement).
  ◦ Deployed production infrastructure on Render with automated CI/CD pipeline via GitHub Actions.

- **Semantra - Medical Fact Verification System** [⊕]
  FastAPI, LangChain, Mistral 7B, Qdrant, Vector Embeddings (SPECTER2) [◯]
  ◦ Engineered production RAG pipeline (Retrieval-Augmented Generation) processing medical fact-checking queries with <30s response times, optimizing vector retrieval performance by 40% through migration from Weaviate to Qdrant vector database.
  ◦ Architected semantic search system using Qdrant vector database and SPECTER2 embeddings with LangChain orchestration of Mistral 7B LLM, generating evidence-based reports with source citations

SKILLS

- **Programming Languages:** Python, C/C++ (Data Structures & Algorithms), JavaScript
- **Web Technologies & AI:** Node.js, Express, REST APIs, OAuth2/JWT, TailwindCSS, HTML/CSS/JS, LangChain, Mistral 7B LLM
- **Database Systems & others:** Mongoose, MongoDB, Redis, MySQL, BullMQ
- **Cloud, Protocols, Testing & DevOps:** Docker, Cloudinary, Google Cloud, Postman, Jest, Vercel, Netlify, Render, CI/CD Pipelines, GitHub Actions, Git Version Control, HTTP/HTTPS, SSE

ACHIEVEMENTS

- **BNY Code Divas (DSA contest) 2025 -** Round 1 Qualifier, selected among 92k + participants **Feb. 2025**
- **Smart India Hackathon Winner -** Team-collaboration. Developed NyAI, a legal documentation assistant simplifying legal jargon for individuals and small businesses. Led UI/UX design lifecycle. **Dec. 2023**
- **Code4Cause Hackathon Runner Up -** Led a 6-member backend team; coordinated web development and integration under 36-hour constraint. **Oct. 2023**