Prawin Kumar

AI SYSTEMS ENGINEER

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SUMMARY

AI Systems Engineer who ships production ML infrastructure end-to-end — from data pipelines and model training through containerized deployment and API hardening. Track record across legal tech, computational chemistry, construction, and education, with open-source tools spanning RAG systems, GNN inference, LLM fine-tuning, and agentic workflows. Builds fast in any domain; looking for hard problems regardless of sector.

WORK EXPERIENCE

VyapAI vyapai.tech ↗ — Independent AI Practice

Client-facing AI work spanning system design, private infrastructure, and deployment engagements across legal, financial, construction, and research domains. Full portfolio at vyapai.tech.

Research Intern — IIT Guwahati — 12 Weeks

Worked under Dr. Rajiv K. Kar (Asst. Professor, Jyoti & Bhupat Mehta School of Health Sciences & Technology) on CASCADE — a browser-native computational chemistry platform.

- Built an end-to-end molecular workspace featuring 2D sketching, WebGL 3D conformer generation (3Dmol.js), and automated PyMOL workflows.
- Deployed asynchronous GNN and MLP inference pipelines using PyTorch, Celery, Redis, and Docker to predict atomic properties and ADMET profiles in real time.

FLAGSHIP SYSTEMS

Writ — Offline Legal RAG & Local Inference Engine

↗ Website

Air-gapped legal research system with hybrid retrieval and quantized local LLM inference

- Architected an air-gapped legal research system executing 100% locally via quantized 3B/7B GGUF models, ensuring zero external data egress for sensitive client queries.
- Engineered a hybrid retrieval pipeline (dense vector embeddings + BM25 lexical search) indexing Central Acts and Supreme Court judgments, reducing hallucination rates through strict citation grounding.
- Publicly demonstrated the offline agentic RAG architecture live at the Kompact AI Global Launch (Bangalore International Centre).

Python · GGUF · llama.cpp · RAG · FAISS · BM25 · Ollama · Legal NLP

CASCADE — Computational Chemistry & GNN Platform

↗ Live App ↗ Website

Browser-native molecular research workspace — custom 2D sketcher, cheminformatics backend, ML inference

- Built a canvas-to-SMILES pipeline from scratch: custom HTML5 Canvas 2D sketcher with 23 ring/scaffold templates; local SQLite FTS5 drug-name autocomplete (2.8M+ rows) with PubChem API fallback.
- RDKit ETKDGv3 3D conformer generation, MMFF94/UFF force-field minimization, interactive 3Dmol.js/WebGL viewer. PyTorch message-passing GNN (MDRepo-trained) for per-atom property estimates with SHA-256 checkpoint validation.
- Lipinski/Veber drug-likeness, ADMET-AI integration, Morgan-fingerprint Tanimoto similarity search, PDB protein-ligand interaction profiling, and optional GNINA docking.
- Celery/Redis async queue with per-user UUID job isolation, path canonicalization against traversal attacks. Dockerized with liveness/readiness health probes.

Python · Flask · RDKit · PyTorch · GNN · SQLite/FTS5 · Celery · Redis · 3Dmol.js · Docker

Project Neev — Generative Construction & Feasibility Engine

↗ Live App ↗ Website

End-to-end pipeline: site photograph → floor plan → 3D model → CAD / PDF deliverable

- Designed a multi-stage computer vision (OpenCV) and genetic-algorithm pipeline to automate residential plot scanning and optimal 2D/3D floor plan generation (Three.js).
- Built a machine learning cost-estimation engine (scikit-learn, FastAPI) calibrated to CPWD DSR 2025 standards across 28 Indian cities.

Python · FastAPI · OpenCV · scikit-learn · Three.js · Docker · Nginx

TECHNICAL SKILLS

LLM & RAG Engineering	RAG Architectures, Hybrid Search, Qdrant, FAISS, Fine-Tuning (LoRA/QLoRA, Unsloth), Local Inference (GGUF, llama.cpp, Ollama), Agentic Workflows, Prompt/Context Engineering
Machine Learning & Science	PyTorch, Graph Neural Networks (GNNs), scikit-learn, OpenCV, NLP, RDKit, ADMET Profiling, 3Dmol.js
Backend & Systems	Python, FastAPI, Flask, Celery, Redis, REST APIs, SQLite, PostgreSQL, Docker, Linux, Nginx, Git, CI/CD
Frontend & Visualization	JavaScript, Three.js, WebGL, HTML/CSS

EDUCATION

BSc in Data Science & Artificial Intelligence — IIT Guwahati — 2026