

NEEL KHAIRNAR

AI Engineer · Agentic Systems · Clinical NLP · MLOps

+91-9096547588 | neel.khairnar09@gmail.com | LinkedIn | GitHub | Portfolio | LeetCode | NeetCode | ORCID | Academic Site

EDUCATION

Pimpri Chinchwad University, Pune

Aug 2023 – Aug 2027
(Expected)

B.Tech, Computer Science with AI/ML | CGPA: 8.77 / 10.00

Academic Advisor: Dr. Bharat B. Kale (FRSC), PCU R&D Department

Certifications: Deep Learning Specialization · NLP Specialization · ML Specialization — DeepLearning.AI

RESEARCH & PUBLICATIONS

Clinical Reasoning Capabilities of Small Language Models

Independent Research | Under Review — Elsevier AI in Medicine · AIIM-D-26-03721

- Benchmarked SLMs (Llama, Mistral, Qwen, BioMistral) on MedQA, PubMedQA, MedMCQA, ICD-10 datasets.

ML-Based Optimization of Magnesium Extraction from Dolomite

Independent Research | Under Review — Expert Systems with Applications · Elsevier

- Scientifically-grounded ML for pyrometallurgical Mg extraction via CALPHAD/FactSage & inverse process design.

Ensemble ML for Renewable Energy Forecasting & Grid Optimization

Published — ICCTVB 2025, Sanjay Ghodawat University | Best Paper Award · DOI: 10.5281/zenodo.20348928

- Ensemble framework improving physical grid stability. Published & Scopus-indexed conference proceedings.

PROFESSIONAL EXPERIENCE

Research Intern | R&D; Department, Pimpri Chinchwad University

Aug 2024 – Present

- Clinical LLM benchmarking, scientific ML, and industrial AI systems under Dr. Bharat B. Kale (FRSC).
- Secured AMD MI300X GPU access via AMD Developer Cloud; participated in AMD AI Hackathon at IIT Bombay.

Machine Learning Intern | Lysis Technocraft, Pune

Aug 2024 – Feb 2025

- Built end-to-end image processing pipeline (OpenCV + Streamlit); achieved PSNR 25 / SSIM 82% via dark channel prior & morphological erosion.

Remote Sensing Intern | IIRS, ISRO (Remote)

1 Month

- Remote sensing data analysis and deep learning for geospatial processing using Python and OpenCV.

KEY PROJECTS

MedRAG — Clinical Intelligence System

- Production clinical RAG (FastAPI + FAISS + Groq). Faithfulness: 1.0 on live query. Deployed on HuggingFace Spaces + Streamlit.

LLM Evaluation Framework

- Benchmarking across Faithfulness, BLEU, ROUGE-L, BERTScore, latency & cost. PubMedQA: 70% accuracy, 0.84 faithfulness. RLM Depth Analyzer: no accuracy gain past depth 1 at 3.5x cost.

Self-Reviewing Agentic System

- Autonomous LLM agent critiquing, revising, and validating outputs through iterative self-reflection with tool-augmented reasoning.

Production-Grade MLOps Pipeline

- End-to-end: automated retraining, drift detection, MLflow versioning, CI/CD pipelines, FastAPI serving with monitoring dashboards.

OmniRAG — Production RAG Platform

- Hybrid retrieval with intelligent query routing, adaptive loops & live RAGAS eval for grounded, citation-backed answers. Stack: FastAPI, Next.js, FAISS, BM25, Cohere Rerank, Docker, Railway, Vercel.

TECHNICAL SKILLS

Languages & Frameworks	Python, PyTorch, TensorFlow, Hugging Face, OpenCV, LangChain, LangGraph, CrewAI, Neo4j, vLLM
MLOps & Deployment	Docker, MLflow, FastAPI, Streamlit, CI/CD Pipelines, Railway, Vercel, HuggingFace Spaces
Agentic & LLM Stack	LangGraph, CrewAI, RAGAS, LangSmith, Ollama, Tool Use, Multi-Agent Orchestration, ReAct
Vector DBs & Storage	FAISS, ChromaDB, Pinecone, Qdrant, Neo4j
Developer Tools	Claude Code, Git, Linux/Bash, Jupyter, VS Code, MLflow, LangSmith
Core Competencies	Machine Learning, Deep Learning, NLP (LLM/SLM Fine-tuning, RAG, Multi-Agent), Computer Vision, Scientific ML
DSA Practice	LeetCode (Neek19) · NeetCode 150 Submissions — github.com/Neel-K26/neetcode-submissions

KEY ACHIEVEMENTS

Best Paper Award ICCTVB 2025, Sanjay Ghodawat University (Scopus) — Ensemble ML for Renewable Energy Forecasting.

Elsevier Submissions 2 papers under review simultaneously at Elsevier AI in Medicine & Expert Systems with Applications.

AMD GPU Access Secured AMD MI300X GPU access via AMD Developer Cloud for large-scale LLM benchmarking research.

ORCID & Scholar Published researcher profile: ORCID 0009-0002-3587-6574 · Google Scholar indexed.

References and additional project links available at neelkhairnar-portfolio.vercel.app