

Aditya Anil Raut

San Jose, CA | araut1@csuchico.edu | +1 (669) 499-7554 | linkedin.com/in/adityaanilraut | github.com/adityaanilraut

Education

California State University, Chico	Master of Science in Computer Science	Aug 2024 – Present
University of Mumbai	Bachelor of Engineering in Computer Engineering	Feb 2021

Experience

Tata Consultancy Services (TCS)	Apr 2021 – Oct 2023
System Engineer	

- Developed a **web-scraping + similarity-search** pipeline: scraped multi-source content with **Scrapy**, handled JS rendering and **rate limits**, cleaned & chunked text, generated **embeddings** with **Sentence-Transformers/OpenAI**, and built a **FAISS** index with a retrieval API; achieved **95% precision** and **recall@K**.
- Built and shipped production services/APIs in Python on AWS Lambda added caching and containerized with **Docker**.
- Delivered **KPI analytics** end-to-end: modeled data in **SQL**, built stakeholder dashboards in **Tableau**, and defined **data contracts**; enabled **self-serve insights** that lifted target KPIs by **8–12%**.
- Architected and managed **distributed workloads** using **Docker** and **Kubernetes**, deploying and maintaining **scalable infrastructure** on **AWS (EC2, S3, EKS)**.

Skills

Languages: C++, Java, Python, Rust, PL/SQL, JavaScript, C, MATLAB, Swift.

Technologies & Frameworks: Git, FastAPI, React.js, REST APIs, Node.js, Bootstrap, HTML, CSS3, Tableau, Talend, Alteryx, AWS (SageMaker, EC2, ECS, S3), Docker, Kubernetes, PySpark, Power BI, Postman.

Databases: MySQL, MongoDB, Chroma, Firebase, PostgreSQL, Redis.

Machine Learning: CUDA, NumPy, Pandas, Transformers, Scikit-learn, Matplotlib, Seaborn, PyTorch, TensorFlow, NLTK, boto3, SciPy, BeautifulSoup, NLP, Deep Learning, LangFlow, Requests, Pillow, LangChain, Flask, FAISS.

Projects

Code Assistant CLI	github.com/adityaanilraut/homebrew-coderai
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- Designed and shipped **CoderAI**, an **agentic CLI** with **multi-LLM backends** (**OpenAI GPT-5 family + LM Studio** local models) and **dynamic model switching**, enabling side-by-side **latency/cost/quality** comparisons in one session.
- Built a **tool-use agent** via **Model Context Protocol (MCP)**: **file I/O, terminal exec, Git ops, semantic + grep code search, web-docs lookup**, and lightweight **memory**—supporting end-to-end coding workflows from the terminal.
- Designed **pre/post-execution hooks, slash-command UX**, and **interactive/one-shot** modes to streamline developer workflows.

Fine-Tuning Large Language Models (LLMs)	github.com/adityaanilraut/Finetuning-Gemma2
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- **Fine-tuned** an **LLM** to personalize output for a particular task or action.
- Optimized performance and reduced storage costs by **30%** using **LoRA**; **quantized** a 16-bit model to **4 bits (Gemma-2B)** for faster throughput and performance.

Search Engine — RAG

- Developed an **AI-powered search tool** using **Retrieval-Augmented Generation (RAG)** to process search engine results, extract key insights, and generate concise, context-aware summaries.
- Leveraged **cosine similarity** to rank retrieved documents based on **semantic relevance** to the query, improving precision in information retrieval and summary generation.

Chess Engine	github.com/adityaanilraut/Chess-engine
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- Built a chess engine using the **Minimax** algorithm with **alpha-beta pruning** to efficiently predict optimal moves by reducing the search space; **Flask** for backend and **JavaScript** for interactive UI.

Awards & Hackathons

Wefunder AI Hackathon — Context Router (Winner)	Link
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- Developed **Context Router**, an intelligent **LLM-routing system** that dynamically analyzes user queries and selects the most suitable large language model based on **token length**, task complexity, and required **reasoning depth**.
- Won the **Pond Challenge** among 20+ teams; recognized for designing a novel **LLM orchestration** strategy that reduced infrastructure waste and introduced a modular, **cost-aware** deployment paradigm.
- Achieved up to 20% reduction in **API costs** by implementing prompt classification and **cost-aware model switching**.