VINAYAK SAHU

Diving Into AI/ML

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Portfolio: portfolio-delta-two-15.vercel.app/

Technical Skills

Languages & Frameworks: Python, Shell Scripting, Git, GitHub, FastAPI, SQL.
Libraries & Tools: PyTorch, TensorFlow, OpenCV, NumPy, Pandas, Scikit-learn, Matplotlib, Hugging Face Transformers, CLIP, FAISS, YOLOv8, LangChain, LlamaIndex.
Modeling & Training: LoRA, PEFT, Transfer Learning, Causal Language Modeling.
Big Data & Query Engines: HiveQL, HDFS, Apache Hadoop, Cloudera VM.
Deployment & Interfaces: Streamlit, FastAPI, Jupyter Notebook.
Cloud & GPU Integration: CUDA, Kaggle Kernels, Hugging Face Inference Endpoints.
Data Analytics & Visualization: Pandas Profiling, Tableau, Power BI, Advanced Excel.
Soft Skills: Problem-solving, Initiative, Leadership, Teamwork.

Projects

- **Linux Command Copilot - Offline AI Assistant for Shell Automation** (in progress) **[GitHub]**

Building a terminal-native assistant powered by LoRA fine-tuned Phi-2 to execute Linux commands from natural language input.
- Applied parameter-efficient fine-tuning (PEFT) with LoRA on Phi-2 for intent classification and shell command generation.
- Designed and trained on a custom Linux CLI prompt dataset (~3k examples) for accurate command translation.
- Deployed the merged model locally inside a VirtualBox-based Linux VM with no cloud dependency.
- Engineered a **text-to-bash** generation pipeline for automating system operations like user creation, file handling, and networking.
- Stack: Hugging Face Transformers, Python, Shell Scripting, Low-resource LLM Inference, Prompt Engineering.

- **Big Data Analytics on MovieLens – *Hive + Hadoop Query Engine Project* *[GitHub]***

Developed a scalable data analytics pipeline using Apache Hadoop and Hive to extract insights from large-scale movie rating datasets.
- Built end-to-end ETL pipeline: uploaded MovieLens CSV files into HDFS and created external Hive tables.
- Wrote advanced HiveQL queries to analyse most-watched genres, top-rated movies, and user behaviour patterns.
- Leveraged Cloudera QuickStart VM for Hadoop environment setup and managed distributed querying using Hive metastore.
- Implemented partitioning and bucketing for optimized query performance on multi-million record datasets.
- Stack: Hadoop, Hive, HiveQL, HDFS, Cloudera VM, Linux CLI, Big Data Analytics

- **Reel2Retail** – [GitHub]

A video-to-product matching system that detects fashion items in social media reels and matches them with items in a product catalog using YOLOv8, CLIP embeddings, and FAISS similarity search.
- Implemented frame-wise object detection using YOLOv8n for lightweight, real-time GPU-based inference.
- Applied OpenAI CLIP for embedding image and text features into the same semantic space.
- Indexed catalog using FAISS for high-speed similarity matching.
- Tackled challenges like frame redundancy and noisy detections using frame differencing and confidence thresholding.
- Included NLP based keyword classifier for vibe prediction.
- Reduced API latency issues using local caching and asynchronous fetch logic.
- Tech Stack: Python, YOLOv8, OpenAI CLIP, FAISS, NumPy, OpenCV, Scikit-learn, Pandas, NLP, FastAPI, Asynchronous Programming, GPU Inference

Certifications

- **Supervised Machine Learning: Classification** — IBM (Mar 2025) — Credential ID B2DJ3GRE67G5
- **Unsupervised Machine Learning** — IBM (Mar 2025) — Credential ID GOKSDKRYL9L1
- **Supervised Machine Learning: Regression** — IBM (Mar 2025) — Credential ID T8UBYGNR3Y4Z
- **Exploratory Data Analysis for Machine Learning** — IBM (Jan 2025) — Credential ID 1BHHHGVRY5IP

Education

Kalinga Institute of Industrial Technology (KIIT)
BTech in Computer Science | 2023 - 2027