Shubham Mishra

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Github LinkedIn

Education

Lakshmi Narain College of Technology — Bhopal, India
B.Tech (CSE) — 2021-2025

Skills

Programming Languages	C/C++ | Python | C# | JavaScript | HTML/CSS | SQL
Explored Domains	Machine Learning | AI |Computer Vision | NLP | Web Development | Neo4j
Frameworks	PyTorch | Tensorflow | Flask | Librosa | Scikit-learn
DevOps	Selenium | Streamlit/Gradio | Git | Docker | Kubernetes | Google Cloud Registry

Experience

FireLLama — Remote

AI Research Intern — **Feb 2024 – May 2024**

- Worked with various vision-based language models and GNNs to replace the PaddleOCR solution, enhancing the retention of table structures in documents. Additionally, I conducted performance comparisons between open-source VLMs and commercial solutions, setting up tailored benchmarks for OCR evaluation.
- Integrated sophisticated Intent and Entity classification model using wit.ai and other open-source models, boosting NLP capabilities in chatbot applications.
- Developed Python APIs to encapsulate multiple anomaly detection models, ensuring smooth integration into production environments.

DeepLogic — Delhi, India

Deep Learning Intern — **March 2024 – May 2024**

- Worked under the R&D team and engineered high-throughput RAG pipelines to scale and replace Vectara endpoints within DeepLogicAI's enterprise search solutions.
- Outperformed query results from high-precision retrieval models such as ColBERT (v2). Conducted rigorous trials across over 12 permutations of RAG pipelines for advanced components such as embedding models, Re-ranker, Chunking, and Indexing, optimizing for peak performance.
- Delved into the FastAPI codebase to deploy the top-performing RAG pipeline, for enterprise search across extensive Gmail, PDF, and Outlook documents, ensuring a smooth transition into production.

Projects

Graph Vision: Python, PyTorch, VLMs, Graphs — GitHub

- Graph Vision is a Python library registered under PyPI as *graphvision*. This library aims to create a topological graph representing the segments of the image, capturing both spatial and semantic features for each segment.
- It offers custom mapping options for segment topology creation, allowing the localization of objects relative to one another using *Dijkstra's* algorithm. It also supports the comparison of semantic features refined by GNNs and generated by vision-language models for performing visual queries on the graph.

Generative Study Resources: LLMs, Flask, HTML, CSS, JS, Vue.js — GitHub

- A Flask-based web application that utilizes LLMs to generate study resources such as MCQs, flashcards, and Q&A sets from PDFs. Users can access study materials tailored to different complexity levels.
- Ensured content accuracy through rigorous model prompting techniques to prevent hallucinations. Implemented the front end using HTML, CSS, and Vue.js.

Segmentation for Tumor Detection in MRI Brain Scans: Deep Learning, PyTorch, Docker, Streamlit — GitHub

- Model is trained on a diverse dataset encompassing various tumor types, sizes, and locations, capturing the inherent heterogeneity of brain tumors encountered in clinical practice.
- The project has a docker image available on Docker Hub. A user-friendly Streamlit front-end interface on Hugging face Spaces for real-world clinical inference achieving a high validation *Dice score* of *~0.9*.

Pool of Models: PyTorch, ViTs, CNNs — GitHub

- A personal GitHub repository containing a variety of Deep Learning architectures implemented from scratch with PyTorch, features both supervised and unsupervised learning models.
- The architecture primarily includes various important ViTs like Swinn, Dino, MAE, CvT, etc. I've also provided detailed explanations of some of these papers on my medium page as a writer under TheDeepHub publication.

Courses

- Deep Learning Specialization by DeepLearning.AI — Coursera
- Modern Computer Vision PyTorch, Tensorflow2, Opencv — Udemy
- Structuring Database and Management systems with MySQL Coursera — Coursera
- Mastering Data Structures & Algorithms using C and C++ by Abdul Bari — Udemy
- Algorithmic Toolbox by University of California San Diego — Coursera