

Kushal Dahal

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● ABOUT ME

Python backend developer with hands-on experience in data analysis, machine learning and LLM-based systems, and independent research in diffusion and vision-language models.

● EDUCATION & TRAINING

01/01/2020 - 25/09/2025 - KATHMANDU, NEPAL

BACHELOR'S IN INFORMATION TECHNOLOGY - TRIBHUVAN UNIVERSITY

Final year project: Image Caption Generator (densenet201 encoder + Bi-LSTM decoder in flickr30k dataset)

Final grade: CGPA: 3.44/4.00 | **Level in EQF:** 6

● PROJECTS

Creative Image Generation with Diffusion Models *Kaggle · Python, PyTorch, Kandinsky 2.1, LoRA, Gradio*

- Reproduced arXiv:2601.22125 (Song and Elgammal, 2026): a probabilistic creativity framework using PCA-reduced Gaussian density estimation and a differentiable negative log-likelihood loss, with joint token and LoRA (rank 4) optimisation.
- Adapted the original A100 pipeline to a 16 GB T4 (500 prior samples, decoder offloading, CLIP-based semantic checker) with a Gradio interface.

Image Caption Generation with Attention Mechanisms *2024–2025 · Kaggle · Python, PyTorch/TensorFlow, Flickr30k*

- Extended my final-year project with a multi-head attention (Transformer-style) decoder variant.
- Evaluated with BLEU-1 to 4, METEOR, ROUGE, CIDEr and SPICE on held-out samples

Agentic Chatbot with Retrieval-Augmented Generation (RAG) *2024 · GitHub · Python, LangChain, FAISS, Sentence Transformers*

- Built a RAG question-answering system over PDFs using LangChain, FAISS and sentence-transformer embeddings, with agentic document querying and task automation.

● WORK EXPERIENCE

04/11/2024 - CURRENT - KATHMANDU, NEPAL

PYTHON BACKEND DEVELOPER VOLCUSOFT PVT. LTD

Core developer for Hamro Patro Share Market (laganisutra.com), a platform providing live NEPSE market analytics.

- Built and maintained production REST APIs (Django REST Framework, FastAPI) with a service-layer architecture for trading alerts, dashboards and financial workflows.
- Developed anomaly detection and chart pattern recognition features, and automated ETL pipelines for large OHLCV datasets.
- Cut data-processing time by about 75% (indexing, query optimisation, ClickHouse, Pandas) and key API latency from 300 ms to 60 ms (Redis caching).
- Built asynchronous WebSocket services for live trading alerts and indicator updates.
- Deployed YOLO11m as a FastAPI inference service for a live insurance survey application; prototyped LLM (OpenRouter) and RAG chatbot tools.
- Mentored and onboarded a backend engineering intern.

● SKILLS

Programming: Python, SQL | Machine learning and AI: PyTorch, TensorFlow, Keras, scikit-learn, Deep Learning, Computer Vision | Diffusion Models, LLMs and RAG (LangChain, FAISS, Hugging Face, Sentence Transformers) | Data: Pandas, ClickHouse, PostgreSQL, MySQL, MongoDB, Redis, ETL pipelines | Backend: Django, Django REST Framework, FastAPI, Flask, WebSockets

● LANGUAGES

Nepali: native | **English: IELTS Academic overall 7.5 (min. band 6.5)**