Ankit Katwal

Machine Learning and AI | PyTorch, NLP, Computer Vision, RAG

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SUMMARY

Machine Learning practitioner based in Kathmandu, Nepal, with hands-on experience developing applied computer vision models, localized NLP systems, and retrieval-augmented pipelines. Developed SwasthyaAI (an 8-class skin disease classifier achieving 80.4% test accuracy across 29K+ images using ConvNeXt-Tiny), pretrained a Nepali GPT language model on 6.4M sentences under GPU memory constraints, and built regulatory RAG systems with Qdrant. Currently pursuing a Bachelor of Information Technology.

EDUCATION

Model Institute of Technology Sep 2024 - Present

Bachelor of Information Technology, Kathmandu

- Relevant coursework: Deep Learning, Artificial Intelligence, Database Management, Computer Networks

Global School of Science (GPA 3.57) 2022 - 2024

+2 Science (Higher Secondary), Kathmandu

PROJECTS

SwasthyaAI - Skin Disease Classification System **[GitHub]** 2026

- Built an 8-class dermatological screening classifier evaluating ConvNeXt-Tiny and ViT architectures across 29,664 images (ISIC 2019 + DermNet), achieving 80.4% test accuracy and >70% sensitivity on high-urgency malignant lesions (Melanoma, Carcinomas).
- Addressed severe class distribution skew (239 to 12,875 samples per class) using class-weighted loss, CutMix and MixUp data augmentations, and two-stage fine-tuning (linear probe head followed by full parameter update).

Nepali GPT - GPT-2 Style Language Model **[GitHub]** Mar 2026

- Implemented a decoder-only GPT architecture from scratch in PyTorch, featuring multi-head self-attention, learned positional embeddings, and causal autoregressive masking.
- Pretrained on 6.4 million Nepali sentences with a custom 32K BPE Devanagari tokenizer and 512 context length, reaching ~60 perplexity on an RTX 3050 (4GB VRAM) in ~4 hours using float16 AMP and gradient accumulation.

AI Governance and Open-Model Compliance - RAG System **[GitHub]** Apr 2026

- Built an end-to-end RAG pipeline indexing AI governance frameworks, compliance regulations, and technical whitepapers with layout-aware PDF parsing and hierarchical chunking.
- Indexed dense vector embeddings in Qdrant with payload metadata filtering; evaluated retrieval quality using Precision@K and MRR benchmarks to optimize chunk boundaries and embedding selection.

EXPERIENCE

IT Associate, BDS Healthcare Jan 2026 - Present

- Developed and maintained company web platforms, internal tooling, and technical infrastructure for medical equipment operations across healthcare clients.

TECHNICAL SKILLS

Languages:	Python, C
ML/AI:	PyTorch, Transformers, NLP, CNNs, Computer Vision, RAG, ConvNeXt, ViT
Data/Tools:	Pandas, NumPy, Matplotlib, MySQL, Git, Qdrant
Frameworks:	FastAPI, Flask, Streamlit, Gradio, LangChain, LlamaIndex, Hugging Face
Infrastructure:	Docker, AWS, GCP

LEADERSHIP & CERTIFICATIONS

College Representative, Code for Change 2026 - Present

- Promote Code for Change programs on campus and encourage student participation in social-impact and technology-driven initiatives.

Certifications: Annual Nepal AI School (ANAIS, NAAMII) | Machine Learning Specialization (DeepLearning.AI) | CS50x (Harvard University) | Kaggle: Intro to Machine Learning, Pandas, Intermediate Machine Learning, Data Visualization, Feature Engineering