

Sushan Adhikari

Computer Engineering Student

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Profile

Computer Engineering student with practical experience in AI, Machine Learning, Computer Vision, and data processing. Contributed to a national pension platform, multilingual NLP research, LLMs, and Computer Vision. Published research in various fields spanning DL, NLP, CV, LLMs, and RAG.

Education

- **Indian Institute of Technology Palakkad (Exchange Semester)** *Jan 2025 – May 2025*
 - B.Tech, Computer Science and Engineering
 - Coursework: Intro to AI, Linear Algebra, Compiler Design, Graph Theory & Combinatorics.
- **Kathmandu University, School of Engineering** *Jan 2022 – Feb 2026*
 - B.Eng. in Computer Engineering (CGPA till 7th Semester: 3.88)
 - Coursework: Computer Vision, Databases, Computer Architecture, Advanced Calculus, Statistics, Differential Equations.

Technical Skills

Languages & ML:	Python; PyTorch, Scikit-Learn; OpenCV, YOLOv8; Pandas, NumPy.
Deployment & Inference:	NVIDIA DeepStream, Triton Inference Server, Docker, Git.
Backend & Web:	FastAPI, Flask, REST APIs, JWT/OAuth basics.
Data & Tools:	PostgreSQL, data preprocessing & annotation; Overleaf, LaTeX.
Other:	CI/CD basics, MS Office.

Internship Experience

- **Computer Vision Intern**, KyraWorks *Oct 2025 – Jan 2026*
 - Deployed multiple models(5+) in Triton Inference server with Docker containerization for production environments.
 - Researching and testing NVIDIA DeepStream, GStreamer, and Triton Inference Server for real-time multi-camera(100+) frame processing.
- **AI and Data Engineer**, Mercuri.world (non-profit, volunteering) *Jan 2025 – Present*
 - Building the backend for the CareerQuest Platform in Django
 - Building ML-based job recommendation pipeline (50+ job types) for employment access for people with mental illness in distributed team (150+ volunteers).
- **Full-Stack Development Intern**, Pension Management System for Nepal *Jun 2025 – Oct 2025*
 - Contributed to national pension platform redevelopment (60+ pages) (600k+ users) with role-based access.
 - Implemented first governmental liveliness detection in Nepal with anti-spoofing using Amazon Rekognition.

Research Experience & Publications

- **Legal NLP — Nepali–English Translation for Legal Documents** *May 2024 – Present*
 - Built parallel corpus ($\approx 10k$ sentence pairs) from legal texts using PyTesseract with manual alignment/verification.
 - Working in Active Learning Lab at Kathmandu University for model training and data processing.
 - Advisors: Dr. Rajani Chulyadyo(rajani.chulyadyo@ku.edu.np), Prof. Dr. Bal Krishna Bal(bal@ku.edu.np).
- **A Comparative Study of Explainability Methods for Hybrid CNN-Transformer Document Layout Analysis** *Dec 2025 – Present*
 - Working on enhancing model transparency and provide insights for debugging, improving human-AI trust in document intelligence systems.
 - Advisors: Dr. Pankaj Raj Dawadi(pdawadi@ku.edu.np))
- **Physics-Informed Data Augmentation for Sediment Concentration Prediction in Data-Scarce Himalayan Rivers** *Nov 2025 – Present*

- Comparison of Traditional and Advanced Physics-based data augmentation strategies for sediment concentration prediction.
- Advisors: Dr. Mukesh Raj Kafle(mkafle@pcampus.edu.np))
- **RAG for Theoretical CS Education: Algorithm Analysis & Complexity Theory** *USC Nov 2025*
 - Developed AlgoRAG system with knowledge base of 847 lecture slides, 312 practice problems, and 156 proof templates.
 - Implemented domain-specific optimizations for mathematical entity recognition and proof-related query handling.
- **Automated Calculus Animation Generation Using Fine-Tuned LLMs** *USC Nov 2025*
 - Fine-tuned LLM on 537 Manim code snippets created manually and made it public to automate derivative visualization generation and further research on this area.
- **Detecting Image Forgeries & Deepfakes: Comparative Study** *NCCI Aug 2025*
 - Assembled mixed dataset (140k+ images) and benchmarked CNNs vs Vision Transformers (InceptionV3: 94% accuracy).
 - Supervisor : Prof. Dr. Gajendra Sharma (gajendra.sharma@ku.edu.np)
- **Enhancing Ethical Reasoning in Tiny LLMs** *NCCI Aug 2025*
 - Created synthetic ethical-dilemma dataset ($\approx 1k$ cases) covering utilitarian, deontological, and virtue ethics.
 - Fine-tuned TinyLlama-1.1B using LoRA to create 3 specialized agents; evaluated via philosophical consistency metrics.
 - Supervisor : Sanjog Sigdel (sanjog.sigdel@ku.edu.np)

Certifications

- Astronomer Certification for Apache Airflow Fundamentals (Astronomer)
- Intermediate SQL , Supervised & Unsupervised Learning with Scikit-Learn, AI Fundamentals (DataCamp)
- Understanding Embeddings for NLP (OpenHPI)

Achievements & Leadership

Competitions:

- Presenter of the team and also developed computer-vision pipeline for fish-disease classification (10k+ images, 60% baseline accuracy); won Hult Prize OnCampus and represented Nepal at Summit in Bangkok, Thailand(2024).
- Finalist — ICT Awards 2024 (Rising Star Innovation).
- People's Choice Winner — NASA Space Apps Challenge 2024 (team award).
- Winner in Health Track in First AI Hackathon of Nepal (AI Crusade 2023)

Scholarships:

- Recipient of Mahatma Gandhi Scholarship provided by Indian Embassy in High School(2019-2021)
- First Semester merit based scholarship in Kathmandu University(2022)

Internal Relations & Operations Lead, KU HackFest 2024

- Coordinated logistics, judge communication, and volunteer management for 48-hour hackathon (200 team applications).

References

Prof. Dr. Bal Krishna Bal

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Kathmandu University

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