

Sushan Adhikari

Computer Engineering Student

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Summary

Computer Engineering student with project experience in AI, Machine Learning, Computer Vision, and IoT systems. Worked on applications including a national pension system (200k+ users), AI-based environmental monitoring, and tools recognized by Hult Prize and ICT Awards. Research accepted at national conferences on deepfake detection and ethical reasoning in LLMs. Proficient in Python, PyTorch, Spring Boot, and Angular, with experience collaborating in multidisciplinary teams.

Education

- **Indian Institute of Technology Palakkad** Jan 2025 – May 2025
 - B.Tech (Exchange Semester), Computer Science and Engineering; GPA: 7.61/10.
 - Coursework: Advanced AI, Advanced Linear Algebra, Compiler Design, Graph Theory & Combinatorics; research exposure through exchange.
- **Kathmandu University, School of Engineering** Jan 2022 – Feb 2026
 - B.Eng. in Computer Engineering; CGPA: 3.91/4.00.
 - Coursework: AI, Networking, Databases, Advanced Calculus, Differential Equations, Statistics & Probability, Computer Architecture, Microprocessors, Embedded Systems, Graphics, Software Analysis & Testing.

Technical and Leadership Experience

- **AI and Data Engineer**, Mercuri.world (non-profit initiative) Jan 2025 – Present
 - Designing and implementing a machine learning-based job recommendation system (8.8k+ job listings across 1k+ cities, 20+ languages) to support individuals with mental illness in finding suitable employment.
 - Collaborating with a global volunteer team from 40+ countries; contributing to cloud infrastructure, API development, and data pipelines—supporting a platform that achieved a 445% increase in resources and 950% growth in language translations in 2024.
- **Co-Founder & COO**, Dr.Fish (AI-powered aquaculture startup) Jan 2023 – Present
 - Developed a CV-based fish disease detection model (10k+ images) achieving ~60% accuracy; currently improving performance with ResNet, ViT, and other CNN architectures.
 - Spearheaded R&D of an AI+IoT solution for predictive aquaculture management, enabling early detection of algae blooms and diseases, reducing water pollution, and optimizing resource usage.
 - Represented Nepal at the Hult Prize Summit (Bangkok 2024) after winning the OnCampus round; finalist in ICT Award Rising Star Innovation (Top 5, 2024) and Founders' Hub Conference (2024).
- **Full-Stack Developer**, Pension Management System (Government project) Jun 2025 – Present
 - Leading end-to-end redevelopment of a national pension platform serving **200,000+ pensioners**, with role-based access for employees, section officers, banks, and administrators.
 - Architected a **60+ page frontend** using Angular and Bootstrap, supported by detailed DFDs, flowcharts, and a modular architecture; backend under development with Spring Boot, OAuth2, JWT, PostgreSQL, and JasperReports.
 - Coordinating integration with **28 major commercial banks in Nepal** for real-time pension distribution and verification workflows.

Research Experience

- **Legal NLP (Nepali–English Translation for Legal Documents)** May 2024 – Present
 - Built a **10k-sentence** parallel corpus via OCR (PyTesseract), manual editing, and verification by law students.
 - Fine-tuned MBART50 and custom transformers, achieving a **BLEU score of 0.42**; ongoing experiments to improve translation quality.
 - Supervised by Dr. Rajani Chulyadyo (rajani.chulyadyo@ku.edu.np) and advised by Prof. Dr. Bal Krishna Bal (ba1@ku.edu.np).

- **Detecting Image Forgeries and Deepfakes: A Comparative Study of CNN and Transformer Models** *NCCI 2025 — Accepted with Revision*
 - Created a **140k+ image** custom dataset (manipulated + AI-generated) across **11 manipulation types**.
 - Benchmarked InceptionV3 vs. Vision Transformer: InceptionV3 achieved **94.0% accuracy** (+5.51% over ViT) with **38% faster training** and **27% less memory usage**.
 - Established new benchmarks for digital image forensics, challenging assumptions about transformer dominance in vision tasks.
- **Enhancing Ethical Reasoning in Tiny Language Models via Fine-Tuning and Multi-Agent Consensus** *NCCI 2025 — Marginally Accepted with Revision*
 - Developed a synthetic dataset of **1,000 ethical dilemmas** across utilitarian, deontological, and virtue ethics perspectives using Gemini 2.5 Pro.
 - Fine-tuned TinyLlama-1.1B models with LoRA into three specialized agents; achieved philosophical consistency scores of **97.8** (Deontology), **95.2** (Utilitarianism), and **96.5** (Virtue Ethics).
 - Implemented a confidence-weighted consensus mechanism to improve decision robustness in resource-constrained environments.

Technical Skills

Languages & ML:	Python; PyTorch, TensorFlow, Scikit-Learn; OpenCV, YOLOv8; Pandas, NumPy
Backend & Web:	Spring Boot, FastAPI, Angular, JavaScript (ES6+), Docker, Git, PostgreSQL
Edge & Embedded:	Raspberry Pi, ESP32 (IoT deployments)
Cloud & Orchestration:	Apache Airflow (DAG authoring), containerization (Docker)
Blockchain & Smart Contracts:	Solidity (basic dApp development)

Certifications

- Astronomer: **DAG Authoring & Airflow Fundamentals** (Apache Airflow)
- DataCamp: **Supervised & Unsupervised Learning, AI Fundamentals, Data Literacy**
- OpenHPI: **Understanding Embeddings for NLP** — building & applying word/sentence embeddings

Selected Projects

- **AgniNetra — AI & IoT Forest Fire Detection** *Personal / Team project*
 - Collected and annotated **8k+ images** (no augmentation); deployed YOLOv8 detector on Raspberry Pi + ESP32 for edge inference with GPS alerts.
 - Achieved baseline **~70%** detection accuracy (fire & smoke) on in-field tests; optimized for low-latency on constrained hardware.
- **MastiskaTrack — GPT-powered Mental Health Assessment** *Personal / Team project*
 - Built embeddings pipeline (ChatGPT API) to ingest medical documents and map user responses to standardized questionnaires.
- **Insurance Fraud Claims Detection (Nepal context)** *Research / Application*
 - Developed full-stack prototype for automated health insurance claim screening using public data.
 - Model metrics: **Accuracy 0.94, Precision 0.80, Recall 0.50, F1 0.62** — to reduce manual reviews and prioritize suspicious claims.
 - Supervisors: Assoc. Prof. Rabindra Bista (rbista@ku.edu.np), Santosh Khanal (skhanal@ku.edu.np).
- **CrowdChain — Decentralized Crowdfunding dApp** *Prototype*
 - Implemented Solidity smart contracts and React frontend to prototype transparent, verifiable crowdfunding and escrow flows.
- **Cosmira — Interactive Solar System (Education)** *NASA Space Apps Challenge 2024*
 - Built educational web app (JavaScript + Astro) with quizzes, orrery model, and asteroid prediction demo (model accuracy **~70%**).
 - Awarded **People's Choice** at NASA Space Apps Challenge 2024.

Awards & Achievements

- **Winner** — AI Crusade 2023 (Health Track).
- **Semi-finalist** — KU Integration Bee.

- **Recipient** — Mahatma Gandhi Scholarship (High School).

Leadership & Extracurricular

- **Internal Relations & Operations Lead**, KU HackFest 2024
 - Managed logistics, volunteer coordination, judge communications, and stakeholder engagement for Nepal's largest student hackathon (200+ applications, 30 shortlisted).
- **Community Coordinator**, Health Informatics (KU Computer Club)
 - Organized localization sprints translating 1,000+ words for health platforms (Bahmni, DHIS2), enhancing local accessibility.
- **General Member**, KUCC; **Board Member**, Leo Club & Rotaract Club
 - Supported community outreach, technical workshops, and event organization for networks totaling 500+ members.

Languages

English (Proficient), Nepali (Native), Hindi (Conversational)

References

Available upon request.