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Summary

Computer Engineering graduate (ACEM, 2026) and full-stack engineer at **Drop**, owning backend services, the website and the recommendation system of a live social platform. **Fusemachines AI Fellow 2026** and selected **Prixa Student Collaborator** (cattle muzzle biometrics); currently researching a monkey-deterrence system. Focused on computer vision, ML systems and the backends that serve them.

Experience

Full-Stack Engineer (AI/ML & Backend) *Jan 2026 – Present*

Drop (dropit.club) — social platform for real-world events; joined as AI/ML & Backend Intern

- **Top committer** on the Next.js website, second on the Node.js (TypeScript) API; own features from API design through the web UI.
- Shipped features end to end: hub group chat with storage billing, message forwarding and pinning, QR-ticketed events, Apple in-app-purchase coin store, Fonepay postpaid billing.
- Own the **For-You recommendation service** (FastAPI, FAISS, sentence-transformers); migrated the feed from push fan-out to pull with a RabbitMQ drain, removing an always-on recommender loop.
- Built a **Cloudflare Worker CDN** for private video (HMAC-tokened URLs, edge cache) and a signed-URL cache for S3; fixed 108-MP avatars decoded per paint (∼860 images shrunk, page layers 240 → 50).
- Own the **EC2/Docker deployment**: migrated production, resolved OOM incidents, wrote the health runbook; closed a ticket-data leak and missing-auth routes.

AI Fellow *2026 (final stage)*

Fusemachines AI Fellowship — selected cohort, 16 weekly builds

- Churn models with SMOTE inside CV folds and SHAP (AUROC 0.81), text-to-SQL agent over PostgreSQL, CRF NER, LSTM classifier, BERT vs. Qwen-LoRA routing.
- Built **ShopAssist AI**: RAG + tool-calling support assistant with an ONNX intent router (99.8% accuracy, ∼1 ms) and a multi-agent dispute investigator with a verifier agent (7/7 cases vs. 3/7 single-agent).

Research Assistant — Monkey Deterrence System *Ongoing*

ACEM, supervised by Assoc. Prof. Dr. Shankar Dhakal

- Vision-based detection of monkeys near farmland with automatic deterrent triggers, aimed at reducing crop losses for farmers in Nepal's hills.

Projects

1. Muzzle-Based Biometric Identification for Cattle in Nepal

Prixa Student Collaborator research project, 2025 – 2026

- Collected a **custom dataset** on Kathmandu-valley farms: **90 cattle** with face, body and muzzle images; muzzle- and body-based approaches.
- **Classical**: LBP, LPQ, HOG, Gabor, blob features + SVM. **Deep**: ResNet-50 + **ArcFace** at **86.6% Top-1 / 94.2% Top-5** over 455 identities (EER 0.037); also ResNet-18, MobileNet, DenseNet, Swin.
- **Flutter app** to register and identify cattle by camera. **Tech**: Python, TensorFlow/Keras, PyTorch, OpenCV, Flutter.

2. Skin Lesion Classification & Segmentation (CNN + U-Net)

- HAM10000 (10,015 images, **7 classes**) balanced to 5,000 per class; custom CNN vs. ResNet-50 and MobileNet transfer learning.
- U-Net segmentation (Dice + focal-Tversky loss); **Flask app** returns class, calibrated confidence and mask. **Tech**: TensorFlow/Keras, Flask.

3. Universal IMU-to-Health Pipeline (Protobytes Hackathon 2.0)

- Self-supervised 1D-CNN + NT-Xent embeddings for cross-device wearables; **83% accuracy**, **96.3%** on falls (SisFall, WISDM, PAMAP2). **Tech**: PyTorch, Streamlit.

Other: Similar Image Detection App (on-device pHash + dHash duplicate finder, Flutter); Journey to Explore Nepal (tourism site, Express + Gemini chatbot); Contact Management System (Python/Tkinter).

Achievements

Fusemachines AI Fellow 2026 — selected cohort.

Prixa Student Collaborator — selected, 2025.

Represented Nepal at Techfest, IIT Bombay; **Runner-up**, Meshmerize (2022).

Runner-up, Robo Soccer at Orbit Engineering Expo.

Protobytes Hackathon 2.0 (Feb 2026) and 1.0, PACE / ACEM.

Volunteer & Referee, Cozmo Clench at Technorion Nepal 2022.

Volunteer, Startup Fest by Robotics Association of Nepal.

Skills

Languages:
Python, TypeScript, JavaScript, C, C++, Dart, SQL

AI/ML:
PyTorch, TensorFlow/Keras, scikit-learn, OpenCV, Hugging Face, FAISS, ONNX, SHAP, Pandas, NumPy

DL Models:
ResNet, MobileNet, DenseNet, Swin, U-Net, ArcFace, LSTM, BERT / LoRA

Classical Image Processing:
LBP, LPQ, HOG, Gabor, Blob Detection

Backend:
Node.js, Express, FastAPI, Flask, MongoDB, PostgreSQL, MySQL, Redis, RabbitMQ, Socket.IO

Cloud, DevOps & Testing:
AWS (S3, Lambda, EC2), Cloudflare Workers, Docker, CI/CD, Firebase, Linux, Git, Postman, Playwright, pytest

Frontend & Mobile:
Next.js, React, Redux Toolkit, Tailwind, Flutter

Hardware:
ESP32, Raspberry Pi Pico, Arduino, Pixhawk, KK2.1.5 (drones)

Education

ACEM *B.E. Computer Engineering*
2022 – 2026 — **Graduated**

CCRC *+2 Science (Math)*
2019 – 2021 — GPA: **3.55**