Nawaraj Khanal

AI/ML ENGINEER | GRAPH LEARNING | EXPLAINABLE AI | COMPUTER VISION

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PROFILE

Machine learning developer focused on graph-based fraud detection, explainable AI and computer vision. Built a fraud and anomaly detection system that represents transactions as a graph and combines node embeddings, anomaly detection and supervised classification. Project experiments reported a 20% improvement in anomaly recall on graphs with more than one million nodes. Currently extending this work towards API development and reproducible ML workflows.

EXPERIENCE

Junior AI Engineer | Nepal Link Communication

SELECTED PROJECTS

Graph-Based Fraud & Anomaly Detection System GitHub

Python, PyTorch Geometric, NetworkX, Neo4j, Node2Vec, scikit-learn, SHAP, Streamlit

- Represented transactions as a graph and combined Node2Vec embeddings, graph neural networks, anomaly detection and supervised classification to identify suspicious account activity.
- Project experiments reported 20% higher anomaly recall on graphs with more than one million nodes. Added SHAP explanations and a Streamlit dashboard to show why an account was flagged.

Loan Default Prediction with Explainable AI GitHub

Python, scikit-learn, SHAP

- Built a loan-default classifier and used SHAP to explain which features contributed to individual predictions.

Heart Disease Prediction System GitHub

Python, scikit-learn, Logistic Regression, SVM, SHAP

- Developed an interpretable risk-prediction pipeline that recorded an AUC-ROC of 0.88 in project evaluation. Academic project, not a diagnostic tool.

Computer Vision Detection & Monitoring GitHub

Python, OpenCV, YOLOv8, PyTorch

- Developed prototypes for drowsiness detection, object tracking and medical-image classification using computer vision models and image augmentation.

ML Systems & MLOps Lab (in progress) GitHub

FastAPI, Docker, pytest, MLflow, CI

- Working on a reproducible model-to-service workflow, including a FastAPI inference API, Docker packaging, automated tests and experiment tracking.

TECHNICAL SKILLS

Programming: Python, JavaScript, C++, C, SQL, Bash

Machine learning and data: scikit-learn, PyTorch, PyTorch Geometric, TensorFlow, pandas

Graph learning and explainability: NetworkX, Node2Vec, Neo4j, SHAP

Computer vision: OpenCV, YOLOv8

Application development and tools: FastAPI, Django, Streamlit, React, Node.js, Git, Google Colab

Currently developing: Docker, MLflow, pytest, CI/CD, model monitoring

EDUCATION

Bachelor in Computer Engineering | Purbanchal University

Relevant coursework: Machine Learning, Computer Vision, Graph Neural Networks, Data Analytics, System Architecture

RECOGNITION

- **Best System Award** - Graph-Based Fraud & Anomaly Detection System
- **Best Project Proposal (2024)** - Heart Disease Prediction System