

Girban Adhikari

COMPUTER ENGINEER · AI/ML

Bhaktapur, Bagmati Province, Nepal, 44800

☎ (+977) 9840904511 | ✉ adgirban1@gmail.com | 🌐 www.girban.com.np | 📷 adgirban | 📺 adgirban | 🎓 Google Scholar | 📄 Research Gate

Education

IOE Thapathali Campus, Tribhuvan University

Kathmandu, Nepal

BE IN COMPUTER ENGINEERING

Apr 2021 - Apr 2025

- **Relevant Coursework** - Theory of Computation, Data Mining, Microprocessors, Embedded Systems, Operating Systems, Probability & Statistics and Data Structure & Algorithm
- **Research Interests** - Synthetic Data Generation, Generative Modeling, Computer Vision and Video Understanding, Multimodal Representation Learning, Robust and Trustworthy Machine Learning

Skills

Programming

Python, C, C++, SQL, JavaScript, Git

Deep Learning

Neural Networks, CNNs, RNNs, LSTM, Transformers, GANs, Diffusion Models

Computer Vision

Image Classification, Object Detection, Video Analysis, ResNet, YOLOv8, OpenCV

Natural Language Processing

Language Modeling, Tokenization, Attention Mechanisms, Transformers

Web Development

Django, Flask, FastAPI, HTML, CSS, REST APIs, Bootstrap

Data & Research

CTGAN, REaLTabFormer, TabDDPM, EHR Data Modeling, ROC-AUC, F1-Score, PR Curves

Frameworks & Tools

PyTorch, TensorFlow, Unity, Unreal Engine

Experience

Tribhuvan University

Kathmandu, Nepal

TEACHING / INSTRUCTION ASSISTANT (T/IA)

Dec 2025 - Present

- Designed and delivered lab sessions (**30 periods/week**) at **IOE Thapathali Campus for six undergraduate courses**: Artificial Intelligence, Data Science, Computer Graphics, Operating Systems, Web Application Programming, and C Programming
- Developed and evaluated **Python-based machine learning labs for 190+ students**, covering regression, classification, gradient descent, and performance analysis, alongside graphics pipelines (line and circle drawing, geometric transformations) and
- Taught **full-stack web development using JavaScript, Django, and React**, as well as introductory rendering workflows with Unity and Unreal Engine.
- Built and maintained technical teaching materials and lab manuals, supported departmental initiatives involving data collection, visualization, and academic coordination

Fusemachines

Kathmandu, Nepal

AI FELLOW

Apr 2024 - Sep 2024

- Gained a strong foundation in machine learning and deep learning concepts, starting from the basics
- Explored advanced topics such as **natural language processing (NLP), image processing, and MLOps**

Academic Projects

Synthetic Data Generation of EHR Using CTGAN, REaLTabFormer, and TabDDPM

Kathmandu, Nepal

TRIBHUVAN UNIVERSITY

Apr 2024 - Apr 2025

- **Tech Stack**: Python, PyTorch, CTGAN, REaLTabFormer, TabDDPM, Transformers, Pandas, NumPy, Scikit-learn
- Evaluated the effectiveness of CTGAN, Transformers, and Diffusion Models in **generating synthetic Electronic Health Records (EHR) data** for various ML and DL tasks.
- Analyzed and compared the quality and performance of synthetic data generated by CTGAN, Transformers, and Diffusion Models for downstream machine learning tasks
- Supervised by the Head of the Department of Electronics and Computer Engineering and presented in the **16th IOE Graduate Conference, 3rd Thapathali Graduate Conference** and to be published as a research paper in the **Journal of Innovations in Engineering Education (JIEE)** all with notable modifications.

Responsive Crime Monitoring and Instant Classification Utilizing AI on Live CCTV Feeds

Kathmandu, Nepal

FUSEMACHINES

Apr 2024 - Sep 2024

- **Tech Stack:** Python, PyTorch, OpenCV, YOLOv8, ResNet18, LSTM, NumPy
- Developed a real-time violence detection system by integrating a **fine-tuned ResNet18+LSTM model for classification** and **YOLOv8 for object detection**, achieving 96.5% accuracy and 70.7% mAP.
- Engineered a low-latency pipeline to process live CCTV streams, including frame sampling, clip saving, and automated alert generation for detected violent activities.
- **Deployed trained models via REST / FAST API** for real-time inference

Ghadi - A 3D Watch Visualizer App with Augmented Reality

Kathmandu, Nepal

TRIBHUVAN UNIVERSITY

Oct 2023 -Apr 2024

- **Tech Stack:** Unity, C#, Vuforia, AR Foundation, Blender
- Developed a **Unity-based mobile application** that allows users to customize and visualize 3D watch models on their wrists using image and marker tracking with Vuforia.
- Implemented interactive **3D watch customization** features with Unity and Vuforia for **augmented reality visualization**
- Supervised by the Head of the Department of Electronics and Computer Engineering

Neoscapes - An Endless Runner Game

Kathmandu, Nepal

TRIBHUVAN UNIVERSITY

Apr 2022 - Sep 2022

- **Tech Stack:** Unreal Engine, C++, Blender
- **Developed in Unreal Engine and C++** as a semi-third-dimensional endless runner game
- Created 3D models and animations using Blender to enhance game aesthetics
- Completed as part of the Object-Oriented Programming course, earning **faculty recognition for innovation**

Publications

MANUSCRIPTS UNDER REVIEW

- **Adhikari, G.**, Acharya, J., Sapkota,A., Ghimire,S., and Ghimire, U.K. "A Comparative Analysis on Synthetic Data Generation of Electronic Health Records using CTGAN, REaLTabFormer and TabDDPM" Under review (2025).

CONFERENCE PUBLICATIONS

- Sapkota,A., **Adhikari, G.**, Acharya, J., Ghimire,S., and Ghimire, U.K. "Synthetic Data Generation of Electronic Health Records using CTGAN, Transformers and Diffusion Models" 16th Insitute of Engineering Graduate Conference (2025).

Licenses & Certifications

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| 2025 | General Registered Engineer , Nepal Engineering Council |
| 2025 | CS50's Introduction to Artificial Intelligence with Python , Harvard University |
| 2024 | Microdegree™ in Artificial Intelligence , Fusemachines |
| 2024 | CS50's Web Programming with Python and JavaScript , Harvard University |
| 2024 | Machine Learning Specialization , Stanford University |
| 2023 | CS50's Introduction to Computer Science , Harvard University |

Honors & Awards

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| 2025 | Paper Presenter , 3rd Thapathali Graduate Conference |
| 2025 | Best Final Year Project , Department Project Committee, IOE Thapathali Campus |
| 2025 | Paper Presenter , 16th IOE Graduate Conference |
| 2023 | Organizer , Vertex Hacks, Chapter Alpha |
| 2022 | Batch Topper , Semester IV |
| 2021-2022 | Semester Topper , Semester I, III, IV |