Alina Devkota

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https://alinadevkota.github.io/Portfolio/

EDUCATION

West Virginia University Jan. 2024 – Present
PhD in Computer Science Morgantown, West Virginia, USA

Tribhuvan University (TU) Nov. 2015 – Sep. 2019
Bachelor's in computer engineering Lalitpur, Nepal

PUBLICATIONS

[1] **Alina Devkota**, Jacob Thrasher, Donald Adjeroh, Binod Bhattarai, and Prashnna K. Gyawali. *FedVG: Gradient-Guided Aggregation for Enhanced Federated Learning*. The IEEE/CVF Conference on Computer Vision and Pattern Recognition 2026 (Under Review).

[2] **Alina Devkota**, Annahita Amireskandari, Joel Palko, Shyam Thakkar, Donald Adjeroh, Xiajun Jiang, Binod Bhattarai, and Prashnna K. Gyawali. *Federated Foundation Model for GI Endoscopy Images*. Npj Digital Medicine (Under Review).

[3] Sanskar Amgain, Prashant Shrestha, Bidur Khanal, **Alina Devkota,** Yash Raj Shrestha, Seungryul Baek, Prashnna Gyawali, and Binod Bhattarai. *Local K-Similarity Constraint for Federated Learning with Label Noise*. arXiv preprint arXiv:2511.06169, Nov 2025, doi: 10.48550/arXiv.2511.06169

[4] Jacob Thrasher, **Alina Devkota**, Prasiddha Siwakotai, Rohit Chivukula, Pranav Poudel, Chaunbo Hu, Binod Bhattarai, and Prashnna Gyawali. *Multimodal federated learning in healthcare: a review*. Journal of Healthcare Informatics Research, 2025.

[5] **Alina Devkota**, Rukesh Prajapati, Amr El-Wakeel, Donald Adjeroh, Brijesh Patel, and Prashnna Gyawali. *AI analysis for ejection fraction estimation from 12-lead ECG.* Nature Scientific Reports, vol. 15, p. 13502, 2025, doi: 10.1038/s41598-025-97113-0.

[6] Jacob Thrasher, **Alina Devkota**, Ahmad P. Tafti, Binod Bhattarai, Prashnna Gyawali, and Alzheimers Disease Neuroimaging Initiative. *Te-ssl: Time and event-aware self supervised learning for alzheimers disease progression analysis.* International Conference on Medical Image Computing and Computer-Assisted Intervention, pages 324–333. Springer, 2024.

[7] Nanda B Adhikari, Sushant Gautam, **Alina Devkota**, Saloni Shikha, Spandan Pyakurel, and Mandira Pradhananga Adhikari. *Near real-time mobile profiling and modeling of fine-scale environmental proxies along major road lines of nepal.* International Conference on Mobile Computing and Sustainable Informatics, pages 605–617. Springer, 2020.

[8] Sushant Gautam, Saloni Shikha, **Alina Devkota**, and Spandan Pyakurel. *Sentence ranking and answer pinpointing in online discussion forums utilising user-generated metrics and highlights*. Fourth International IT Conference On ICT for Smart Computing. NASCOIT, 2018.

SELECTED PROJECTS

Feature Selection in Manufacturing using Knockoff Framework Dec 2024 – Present (**WVU**)

- Implemented knockoff-based feature selection, balancing power and false discovery rate

Federated Foundation Model May 2024 – Present (**WVU**)

- Designed and trained federated foundation models for gastro-endoscopy imaging with data privacy
- Evaluated on disease classification, object detection, and instance segmentation

Ejection Fraction (EF) Estimation from 12-lead ECG Feb. 2024 - Jan 2025 (**WVU**)

- Developed and compared multiple AI models (ResNet, Transformers, MLP, SVM, RandomForest) on a 55k-patient ECG dataset to estimate EF in the rural Appalachian population

Contrastive Learning Framework for Knowledge Distillation Apr. 2024 - Jan 2025 (**WVU**)

- Conducted robustness analysis against adversarial attacks and imbalanced data

Assessment of weather anomalies and pollution proxies around Kathmandu Valley Nov. 2018 – Nov. 2019 (**TU**)

UGC Collaborative Research Grant (Award, CRG-73/74-01Egg)

- Analyzed mobile-sensor environmental datasets to study weather anomalies and pollution patterns in the Kathmandu Valley
- Performed temporal and spatial modeling to identify major pollution drivers and seasonal variability

Smart Discussion Forum June 2018 – Aug. 2018 (**TU**)

- Developed a Django-based pluggable discussion forum that uses text highlighting and user-generated metrics to surface the most relevant answers

EXPERIENCE

LCSEE, West Virginia University Jan 2024 – Present

Graduate Research Assistant Morgantown, West Virginia, USA

Working on applying AI and ML to improve healthcare.

- Developed AI models to estimate heart ejection fraction from 12-lead ECG signals.
- Designed and trained a federated foundation model for GI endoscopy imaging to preserve data privacy across institutions.

- Implemented knockoff-based feature selection framework to identify statistically robust predictors in manufacturing datasets

coac GmbH April 2022 – Dec. 2023

Machine Learning Engineer Cologne, Germany

Ideated and implemented AI solutions to meet project requirements

- Improved OCR and object detection in PDFs containing scanned schematic diagrams
- Conducted research on optimization algorithms to minimize lockdown in German counties due to the pandemic, and used AI models to replicate a mathematical model to reduce computation time

NepAl Applied Mathematics and Informatics Institute for Research (NAAMII) July 2021 – July 2022

Research Assistant, Part-time Kathmandu, Nepal

Conducted research to assist medical personnel in low-income countries like Nepal.

- Implemented a U-Net–based segmentation model for fetal head localization and circumference measurement on the HC18 dataset
- Developed and evaluated classification models for breast cancer detection using ultrasound imaging
- Investigated semi-supervised learning strategies and attention mechanisms to capture complex relationships across heterogeneous medical data points

Fusemachines Nepal Sep. 2019 – April 2021

Machine Learning Engineer Kathmandu, Nepal

Developed AI applications to adhere to designs that support business requirements by researching and developing machine learning models

- Led a team in an intelligent surgery project to develop and deploy an ML pipeline to create 3D bones from multiple views of 2D X-ray images
- Applied pseudolabelling to use a large amount of unannotated data to track student status in FuseClassroom, an online learning management system
- Integrated Elasticsearch to reduce the search space in text comparisons to detect plagiarism between assignments within a class in FuseClassroom

UBL R&D Center July 2019 – Sep. 2019

Software Engineering Intern Lalitpur, Nepal

- Designed and developed a discussion forum module for a Learning Management System using Django, including database schema design and REST API development.
- Implemented front-end features to support user interactions, content browsing, and seamless integration with the LMS platform.

Leapfrog Technology, Inc Feb. 2019 – Aug. 2019

Software Engineering Intern Kathmandu, Nepal

- Collected, cleaned, and processed environmental datasets and developed an LSTM-based forecasting model for weather parameters in the Kathmandu Valley.
- Built a web application to visualize real-time weather and pollution metrics and present model-predicted forecasts to end users.

AWARDS

WVU AI Symposium (Poster Competition) May 2025
West Virginia University West Virginia, USA
- Second place.

Graduate Poster Competition Apr. 2024
Lane Department of Computer Science and Electrical Engineering, WVU West Virginia, USA
- Second place and honorable mention.

Best Project Award Nov. 2019
Department of Electronics and Computer Engineering, Pulchowk Campus, IOE, TU Lalitpur, Nepal

Fusemachines AI Fellowship Nepal - 2019 March 2019
Fusemachines Nepal Kathmandu, Nepal

Academic Excellence Scholarship 2015
Institute of Engineering, Tribhuvan University Lalitpur, Nepal

SKILLS

Programming Languages: Python, C, C++, MATLAB, HTML, CSS, JavaScript
Libraries: Pytorch, Scikit-learn, OpenCV, FastAPI, Django, Numpy, Pandas
Tools: Matplotlib, MongoDB, SQL, Jupyter Notebook, Conda
Others: AWS, Git, Github, LaTeX, Jira, Docker, REST API

LEADERSHIP EXPERIENCE

Presenter July 2025
WVU Summer Undergraduate Research Experience: Generative AI Workshop WVU, USA

Speaker March 2023
Global AI Bootcamp, Nepal Cloud Professionals Kathmandu, Nepal

Teaching Assistant, Volunteer Dec. 2021
Third Nepal Winter School in AI, NAAMII Bhaktapur, Nepal

Speaker April 2021
Research Cell, Fusemachines Nepal Kathmandu, Nepal

Organizer 2016 – 2019
LOCUS, Pulchowk Campus, IOE, TU Lalitpur, Nepal

Volunteer Dec. 2019

Ministry of Education, Nepal, in collaboration with NSDEVIL — Lalitpur, Nepal

Trainer — July 2018 – Dec. 2018
CAN Cybersecurity Taskforce — Kathmandu/Hetauda, Nepal

Trainer — Nov. 2017
Children in Technology — Kathmandu, Nepal

Department Coordinator — Nov. 2015 – Dec. 2016
Kathmandu Valley Leo Club, District 325 A1 — Lalitpur, Nepal

REFERENCES

- **Prashnna K. Gyawali**
  Assistant Professor
  Lane Department of Computer Science and Electrical Engineering
  West Virginia University
  prashnna.gyawali@mail.wvu.edu