Alina Devkota

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EDUCATION

West Virginia University Jan. 2024 – Present

PhD in Computer Science Morgantown, West Virginia, USA

Pulchowk Campus, Institute of Engineering (IOE), Tribhuvan University (TU) Nov. 2015 – Sep. 2019

Bachelor's in computer engineering Lalitpur, Nepal

PUBLICATIONS

[1] **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*. arXiv preprint arXiv:2505.24108, May 2025, doi: 10.48550/arXiv.2505.24108.

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

[3] 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. In *International Conference on Medical Image Computing and Computer-Assisted Intervention*, pages 324–333. Springer, 2024.

[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. *arXiv preprint arXiv:2310.09650*, 2023. Under Review at *Journal of Healthcare Informatics Research*, 2024.

[5] 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. In *International Conference on Mobile Computing and Sustainable Informatics*, pages 605–617. Springer, 2020.

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

SELECTED PROJECTS

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

Use a knockoff strategy to select features contributing to prediction by balancing the tradeoff between power and false discovery rate.

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

Used federated learning framework for training foundation models for gastro endoscopy imaging, **enabling data privacy** for the local hospitals while **contributing to a shared model**. The evaluation was done on **three downstream tasks:** Disease Classification, Object Detection, and Instance Segmentation.

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

Analyzed the use of AI models (like ResNet, Transformers, MLP, SVM, RandomForest) for **EF estimation in the rural Appalachian population**. A 12-lead ECG dataset of 55,500 patients from WVU Medicine hospitals in West Virginia was utilized to estimate the EF.

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

Contributed to robustness analysis of the methodologies. Worked particularly on robustness against **adversarial attacks** and resilience to **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),
Undergrad Final Year Major Project

A data mining project for **profiling pollution and weather data** using mobile sensor instrumentation, data warehousing, data visualization, and modeling.

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

Django-based pluggable web application that integrates highlight features and user-generated metrics to **pinpoint exact answers** to people's queries.

EXPERIENCE

LCSEE, West Virginia University Jan 2024 – Present

Graduate Research Assistant Morgantown, West Virginia, USA

Working on applying AI and ML to improve healthcare.

- Used deep learning to **estimate heart ejection fraction** from ECG signals
- Trained a **foundation model** for GI endoscopy images using **federated learning**
- Use **knockoff framework** for **feature selection** in manufacturing

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.

- Used UNET architecture for **segmentation** of fetal head to **measure fetal head circumference** in the **HC18 dataset**
- Used a **classification** algorithm to **detect cancer in ultrasound images** of breasts
- Worked on the exploration of **semi-supervised techniques** and **attention across multiple data points** to capture complex relationships between 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**
- Used **pseudolabelling** to use a large number of unannotated data to track student status in FuseClassroom, an online learning management system
- Used 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 as part of a Learning Management System using Django. Worked on the development of the database, REST APIs, and front-end for the discussion forum

Leapfrog Technology, Inc Feb. 2019 – Aug. 2019

Software Engineering Intern Kathmandu, Nepal

Worked on data collection, pre-processing, and development of a **model (LSTM)** for forecasting weather parameters in Kathmandu Valley, and developed a web-app for **data visualization** of current weather and pollution statistics and to display predicted weather parameters

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