

# Alina Devkota

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## EDUCATION

### West Virginia University

PhD in Computer Science

Jan. 2024 – Present

Morgantown, West Virginia, USA

### Pulchowk Campus, Institute of Engineering (IOE), Tribhuvan University (TU)

Bachelors in computer engineering

Nov. 2015 – Sep. 2019

Lalitpur, Nepal

## PUBLICATIONS

- [1] **Alina Devkota**, Binod Bhattarai, and Prashnna K. Gyawali. Foundation model training with federated learning for gastrovision. Under Review, 2024.
- [2] Sanskar Amgain, Prashant Shrestha, Bidur Khanal, **Alina Devkota**, Yash Raj Shrestha, Seungryul Baek, Prashnna Kumar Gyawali, and Binod Bhattarai. Local k-similarity constraint for federated learning with label noise. Under Review, 2024.
- [3] **Alina Devkota**, Rukesh Prajapati, Amr El-Wakeel, Donald Adjero, Brijesh Patel, and Prashnna Gyawali. Ai analysis for ejection fraction estimation from 12-lead ecg: Insights from rural appalachian data. Under Review, 2024.
- [4] Nima Najafzadeh, **Alina Devkota**, Nima Karimian, Robin Chataut, Nasser M. Nasrabadi, and Prashnna Gyawali. A contrastive objective for multi-model ensemble learning. Under Review, 2024.
- [5] 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.
- [6] 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.
- [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. In *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. In *Fourth International IT Conference On ICT for Smart Computing*. NASCOIT, 2018.

## EXPERIENCE

### LCSEE, West Virginia University

Graduate Research Assistant

Jan 2024 – Present

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 **federated foundation model** for GI endoscopy images.

coac GmbH 

Machine Learning Engineer

April 2022 – Dec. 2023

Cologne, Germany

Ideate and implement AI solutions to meet project requirements and create quality products, mostly dealing with information extraction from documents.

- **Improved OCR** and **time-efficient object detection** in pdfs containing scanned schematic diagrams
- Created **API Endpoints** for initiating text extraction and **maintaining an inspection management system**
- Conducted **research on optimization algorithms** to minimize lockdown in Germany Counties due to the pandemic
- Used AI model to **replicate a mathematical model** to reduce computation time

NepAI Applied Mathematics and Informatics Institute for Research (NAAMII) 

Research Assistant, Part-time

July 2021 – July 2022

Kathmandu, Nepal

Conduct research focused on computer vision tasks that can assist medical personnel in low-income countries like Nepal.

- Used UNET architecture for **segmentation** of fetal head to **measure fetal head circumference** in **HC18 dataset**
- Conducted a detailed literature review for detection of cancer in breast ultrasound images and used **classification** algorithm to **detect benign and malignant cancer in ultrasound images** of breasts
- Working on the exploration of **semi-supervised techniques** and **attention across multiple datapoints** to capture complex relationships between datapoints to use for **limited annotated dataset** available for medical imaging

Fusemachines Nepal 

Machine Learning Engineer

Sep. 2019 – April 2021

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 ML pipeline to create **3D bones** from multiple views of **2D x-ray images**
  - \* **Positioned bones** in 3D to identify varus-valgus deformity using **image registration**
  - \* Used **BOBYQA** algorithm to optimize **eigen parameters** of Statistical Shape Modelling
- Used **pseudolabelling** to use large number of unannotated data to track student status in fuseclassroom, an online learning management system
- Used elasticsearch to **reduce search space** in text comparisons to detect plagiarism between assignments within a class in fuseclassroom
- Conducted detailed **error analysis** of Nepali handwritten digits recognition model by breaking down error classes as part of **research assistant training**
- Created content for machine learning, deeplearning, mathematics and computer science, which are microdegree courses of AI School

UBL R&D Center 

Software Engineering Intern

July 2019 – Sep. 2019

Lalitpur, Nepal

- Designed and developed discussion forum as part of Learning Management System using Django.
- Worked on development of database, REST APIs and front-end for the discussion forum

Leapfrog Technology, Inc 

Software Engineering Intern

Feb. 2019 – Aug. 2019

Kathmandu, Nepal

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

## AWARDS

### Graduate Poster Competition

Lane Department of Computer Science and Electrical Engineering, WVU

Apr. 2024

West Virginia, USA

- Second place and honorable mention.

### Best Project Award

Department of Electronics and Computer Engineering, Pulchowk Campus, IOE, TU

Nov. 2019

Lalitpur, Nepal

- Best project award among all **12** Computer Engineering major projects of the Department of 2019.

## Fusemachines AI Fellowship Nepal - 2019

March 2019

*Fusemachines Nepal*

Kathmandu, Nepal

- Awarded a **1-year fellowship** for a micro master's degree in AI on EdX. Selected as one of 27 students in a highly selective process with a **6.25% acceptance rate**.

## Winner at Spirathon

Nov. 2017

*Spiralogics International*

Kathmandu, Nepal

- Developed a mobile app 'MeriSaathi' for **female safety** with an emergency button feature that could be pressed in case of gender based violence issues or sexual harassment cases.
- Won the two-day app-a-thon where **10 teams** were selected as finalists out of **122 registered teams**.

## Academic Excellence Scholarship

2015

*Institute of Engineering, Tribhuvan University*

Lalitpur, Nepal

- **Ranked 66** among 20,000 examinees (**3rd rank in female category**) at the entrance examination of IOE, and was awarded a scholarship (**full-tuition waiver**) for undergraduate studies at the Central Campus with an **acceptance rate of less than 1%**.

## SKILLS

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**Programming Languages:** Python, C, C++, MATLAB, HTML, CSS, JavaScript

**Libraries:** Pytorch, Scikit-learn, OpenCV, SpaCy, Tensorflow, FastAPI, Django, Numpy, Pandas

**Tools:** Matplotlib, MongoDB, SQL, Jupyter Notebook, Conda

**Others:** AWS, Git, Github, LaTeX, Jira, Docker, REST API, Photoshop

## LEADERSHIP EXPERIENCE

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### 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

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### Prashnna K. Gyawali

*Assistant Professor*

Lane Department of Computer Science and Electrical Engineering

West Virginia University

prashnna.gyawali@mail.wvu.edu