

ARPAN POUDEL

1764 N Leverett Ave, Fayetteville, Arkansas, USA, 72703

479-480-0095 • arpanpoudel@gmail.com • linkedin.com/in/arpan-poudel • arpanpoudel.github.io

OBJECTIVE

Ph.D. student in Computer Science with a focus on machine learning, medical image analysis, federated learning, and computer vision. Experienced in developing and evaluating deep learning models for image reconstruction, classification, and clinical data analysis.

EDUCATION

Ph.D. - Computer Science University of Arkansas, Fayetteville, AR	Dec 2027 (Expected) 4.0 GPA
Master of Science (M.S.) - Computer Science University of Arkansas, Fayetteville, AR	Dec 2024 4.0 GPA
Bachelor of Engineering (B.E.) - Computer Engineering Tribhuvan University, Kathmandu, Nepal	Dec 2018 74 %

SKILLS

Programming Languages: Python, MATLAB, Java, C++

Frameworks & Libraries: PyTorch, TensorFlow, Hugging Face, NumPy, Scikit-learn, Pandas, OpenCV, Flask, Seaborn

Machine Learning & AI: Deep Learning, Feature Engineering, Image Processing, Generative AI, Optimization, Data Analysis, Modeling, EDA, Vision-Language Models

Databases & Big Data: SQL, MongoDB, PySpark, PostgreSQL

Tools & Platforms: Git, Docker, Jupyter Notebook, VS Code, Microsoft Office, Heroku, Excel, Weights & Biases

Soft Skills: Problem-Solving, Communication, Team Collaboration, Creativity, Adaptability

EXPERIENCE

University of Arkansas, Fayetteville, AR: Research and Teaching Assistant	Jan 2022 – Present
<ul style="list-style-type: none">Fine-tuned vision-language models in a federated learning setup using the MIMIC-CXR-JPG dataset for report generation and zero-shot classification.Developed deep learning models in PyTorch to enhance MRI resolution for studying brain microstructure in Alzheimer's patients.Led a project on lensless imaging, solving inverse problems using physics-informed attention-based neural networks, resulting in a 1.35× improvement in reconstruction accuracy.Designed and implemented a clinical data analysis pipeline using Pandas and scikit-learn on 500+ patient records, achieving 85% accuracy in mortality risk classification for Type 2 Myocardial Infarction.Assisted in instruction for 3 undergraduate courses (Algorithms, Data Structures), mentoring students and integrating hands-on projects in Python, Java, and C++.	
Government of Nepal, Jhapa, Nepal: IT Engineer	Nov 2019 – Dec 2021
<ul style="list-style-type: none">Led a 6-member team in designing government Intranet architecture and evaluating e-governance infrastructure, reducing paperwork by 50% under a \$400,000 budget.Delivered digital transformation training to officials, enabling scalable adoption of e-governance tools.	

PROJECTS

Federated Vision-Language Models for Chest X-ray Analysis	Jan 2025 – Present
Fine-tuned multimodal models on distributed MIMIC-CXR-JPG data for zero-shot classification and report generation in privacy-preserving settings.	
<ul style="list-style-type: none">Implemented a federated training pipeline using Hugging Face Transformers and Flower for privacy-preserving fine-tuning of vision-language models.Adapted LoRA adapters trained across clients to generate reports from Chest X-ray images.Evaluated cross-client performance using decentralized metrics logging with Weights & Biases.	

Unsupervised Magnetic Resonance Imaging Super-resolution

Jan 2024 - Dec 2024

Proposed and developed a novel unsupervised deep learning network for Magnetic Resonance Imaging (MRI) capable of generating high-resolution images from low-resolution images which is 5 times faster than current state-of-the-art methods.

- Trained generative model to learn the distribution of medical images to sample high-resolution MRI images reducing the MRI scan time by 30% in multi-node multi-GPUs.
- Prepared and preprocessed a medical dataset to train a custom generative model.
- Proposed a novel sampling algorithm to enforce data consistency using the Wavelet Transform.

Solving inverse problems in lensless image reconstruction with generative models

Aug 2023 - Jan 2024

Created a novel sampling algorithm for controllable image generation for lensless cameras.

- Trained score-based generative model to learn the distribution of natural images as a prior achieved 1.2 times increase in image reconstruction accuracy.
- Implemented an unrolling of the Alternating Direction Method of Multipliers (ADMM) for data consistency.

Object Tracking and Image Segmentation on low-powered devices

Jan 2024 - Present

Implemented an image segmentation and tracking algorithm on FPGA to accurately trace chicken movements.

- Developed and implemented a segmentation model using PyTorch to identify and track chickens in video feeds for real-time processing.
- Implemented a U-Net architecture for efficient segmentation, specifically optimized for FPGA deployment using Verilog.
- Analyzed and compared performance metrics to demonstrate speed enhancements when utilizing an FPGA over traditional GPU setups.
- Translated PyTorch model into FPGA-compatible Verilog code employing the Xilinx Deep Learning Processor Unit (DPU) with Vitis-AI for optimized inference.

PUBLICATIONS

- **A. Poudel**, M. Shrestha, U. Nakarmi, N. Wang, “SRMRI: A Diffusion-Based Super-Resolution Framework and Open Dataset for Blind MRI Super-Resolution,” in Medical Imaging with Deep Learning (MIDL), 2025.
- H. Pradhan, **A. Poudel**, D. Shrestha, A. Rogers, M. Stewart, A. Jereb, J. Harper, M. Li, W. Zhang, J. Chen, Y. Wang, “Concentration-Dependent Responses of *C. reinhardtii* to Silver Ions: Hormetic Response in Growth and Reduction of Motility,” (preprint), 2025.
- **A. Poudel**, U. Nakarmi, “DeepLIR: Attention-Based Approach for Mask-Based Lensless Image Reconstruction,” in Proceedings of IEEE/CVF Winter Conference on Applications of Computer Vision (WACV Workshops), 2024.
- E. Kabir, **A. Poudel**, Z. Aklah, M. Huang, D. Andrews, “A Runtime Programmable Accelerator for Convolutional and Multilayer Perceptron Neural Networks on FPGA,” in Applied Reconfigurable Computing, 2022.
- A. Dhakal, **A. Poudel**, S. Pandey, S. Gaire, H. P. Baral, “Exploring Deep Learning in Semantic Question Matching,” in IEEE International Conference on Computing, Communication and Security (ICCCS), 2018.

VOLUNTEER

- Reviewed submitted papers for conferences, including SSIAI 2024, ICECER 2024, and ICECCME 2024.
- Led and managed the Nepalese Student Organization at the University of Arkansas.

AWARDS

- Won first prize of \$2,500 in the Healthcare Innovation Sprint 2024, organized by the Conductor, Arkansas.
- Reginald R. “Barney” & Jameson A. Baxter Graduate Fellowship 2023.
- First Runner-Up in Genese CodeCamp 2018 Coding Competition.

MEMBERSHIP

- IEEE
- IEEE Computer Society