Safal Thapaliya

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EDUCATION

Ph.D. in Computer Science and Engineering **Jan 2025 - Present**
School of Computing, University of Connecticut *Storrs, Connecticut*
Advisor: Chuxu Zhang, Ph.D.

Bachelor in Computer Engineering **November 2017 - April 2022**
Pulchowk Campus, Institute of Engineering, Tribhuvan University *Lalitpur, Nepal*
Undergraduate Thesis: Epidemiological Surveillance System using NLP [Thesis Link]
Academic Supervisor: Aman Shakya, Ph.D.
- Achieved Rank 24 in the university entrance examination out of nearly 18,000 candidates - top 0.3%, and received the scholarship provided by the Government of Nepal covering full tuition expenses.

RESEARCH EXPERIENCE

Nepal Applied Mathematics and Informatics Institute for research (NAAMII) **May 2022 - Dec 2024**
Research Assistant *Lalitpur, Nepal*
- Supervisor: Bishesh Khanal, Ph.D.
- Research Topics: multi-modal learning, vision-language models, self-supervised learning, medical image segmentation.

Nepal Applied Mathematics and Informatics Institute for research (NAAMII) **August 2021 - March 2022**
Research Intern *Remote*
- Worked on tweet classification for the Nepali language in a low-resource setting.

PUBLICATIONS

Conference Papers
- Poudel, K.*, Dhakal, M.*, Bhandari, P.*, Adhikari, R.*, **Thapaliya, S.***, & Khanal, B. (2024). **Exploring Transfer Learning in Medical Image Segmentation using VLMs**. In *Medical Imaging with Deep Learning*. [Paper link][**MIDL'24 oral presentation**]
- Dhakal, M., Adhikari R., **Thapaliya, S.**, & Khanal, B. (2024). **VLSM-Adapter: Finetuning Vision-Language Segmentation Efficiently with Lightweight Blocks**.[Paper link] [**MICCAI'24 poster**]
- Adhikari R., **Thapaliya, S.**, Dhakal, M., & Khanal, B. (2024). **TuneVLSeg: Prompt Tuning Benchmark for Vision-Language Segmentation Models**.[Paper link][**ACCV'24 oral presentation**]

Journal Papers
- Nakarmi, S., Pudasaini, S., **Thapaliya, S.**, Upretee, P., Shrestha, R., Giri, B., ... & Khanal, B. (2024). **Deep-learning assisted detection and quantification of (oo) cysts of Giardia and Cryptosporidium on smartphone microscopy images**. Machine Learning for Biomedical Imaging, 2(August 2024 issue), 956-976. [Paper link] [**MELBA, August 2024 issue**]

Workshop Papers
- Adhikari, R.*, Dhakal, M.*, **Thapaliya, S.***, Poudel, K., Bhandari, P., & Khanal, B. (2023). **Synthetic Boost: Leveraging Synthetic Data for Enhanced Vision-Language Segmentation in Echocardiography**. In International Workshop on Advances in Simplifying Medical Ultrasound (pp. 89-99). Cham: Springer Nature Switzerland. [Paper link] [**ASMUS'23 Workshop**]
- Adhikari, R., **Thapaliya, S.**, Basnet, N., Poudel, S., Shakya, A., & Khanal, B. (2022). **COVID-19-related Nepali Tweets Classification in a Low Resource Setting**. In Proceedings of The Seventh Workshop on Social Media Mining for Health Applications, Workshop & Shared Task (pp. 209-215). [Paper link] [**SMM4H'22 Workshop**]

Pre-prints/Under review/In Progress
- Dhakal, M., **Thapaliya, S.**, Adhikari R., & Khanal, B. (2024). **CLIPSeg-TFA: Training-Free Adapter for Few-Shot Vision-Language Segmentation**.[*In Progress*]

Teaching Experience

Children's Hospital For Eye Ent & Rehabilitation Services (CHEERS)   **May 21, 2023 - Feb 21, 2024**
AI Instructor   *Lalitpur, Nepal*
- Lectured and mentored a group of 10 interns in an AI-oriented course conducted by NAAMII.

Fourth Annual Nepal AI School 2023 by NAAMII   **May 2023**
Teaching Assistant   *Lalitpur, Nepal*
- Involved in designing the lab materials for the Foundations on Machine Learning lab session.

Third Winter School in AI 2021 by NAAMII.   **December 2021**
Teaching Assistant   *Lalitpur, Nepal*
- Involved in developing the lab materials for the Generative Adversarial Networks lab.

Other Work Experience

LogPoint Inc.   **January 2022 - May 2022**
Support and Solutions Intern   *Lalitpur, Nepal*
- Studied and participated in hands-on sessions on memory profiling, network traffic monitoring, distributed log handling, and monitoring and responding to threats in Logpoint's SIEM architecture.

Clamphook   **November 2019 - June 2021**
Backend Engineer   *Lalitpur, Nepal*
- Participated in designing and developing the server-side architecture for clamphook.com using *Flask* and *MongoDB*.

Licenses and Certifcations

- **Deep Learning Specialization by DeepLearning.AI**
- **Machine Learning by Stanford Online**

Projects

AI Assisted Smartphone Microphony | *NAAMII*, [Project Link] [Paper link]   **2022-Present**
- Working with *Kathmandu Institute of Applied Sciences (KIAS)* to develop object detection models to detect diarrhea cysts from vegetables, stool, and water samples using images captured from smartphone microscopes and brightfield microscopes.
- Trained and evaluated different object detection models (FasterRCNN, RetinaNet, YOLO, Deformable-DETR) to detect diarrhea parasites in microscopic images.
- Developed an online data collection and annotation platform to upload sample images from different locations in Nepal.

Lower Limb Angle Measurement for corrective osteotomy | *NAAMII*   **2023**
- Trained, evaluated, and deployed UNet and nnUNet for bone segmentation, landmark detection, and angle measurement in lower limb CT scans for corrective osteotomy.
- Set up a deployment environment using Flask and Docker to deploy the trained models.

Public Discourse Analysis System | *IOE, Pulchowk Campus & NAAMII*, [Project Link] [Paper link]   **2022**
- Developed COVID tweets analysis platform that allows health decision-makers to view a real-time analysis of narratives of tweets, particularly in Nepali and Devanagari scripts
- Researched and fine-tuned the MuRIL model for tweets in Nepalese language
- Assisted in the design and optimization of the backend and frontend of the web application

Technical Skills

- Proficient in Python, including different machine learning frameworks: Pytorch, Numpy, Scikit-learn, Pandas, and matplotlib
- Skilled in server-side programming using FastAPI, Flask, and Django, and designing functional databases using PostgreSQL, SQLite, and MongoDB
- Practiced in Linux server administration
- Well-versed in using Git and Docker