Rabin Adhikari

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Work Experience

NepAl Applied Mathematics and Informatics Institute for research (NAAMII) *April 2022 - Present*
Research Assistant *Lalitpur, Nepal*

Supervisor: Bishesh Khanal, Ph.D.

- Contributing actively to research projects focused on **Natural Language Processing (NLP)**, **Medical Imaging**, **Semi-supervised Learning**, and **Multi-modal Learning**.
- Employed rigorous research methodologies to analyze data, draw meaningful conclusions, and contribute to advancing knowledge in these domains.

Clamphook *November 2019 - June 2021*
Full Stack Developer *Lalitpur, Nepal*

- Participated vigorously in the development of clamphook.com by implementing the server-side functionality utilizing *MongoDB* as the database and *Flask* as the web framework.
- Leveraged *React* as the front-end technology to facilitate seamless communication between the front-end and back-end components of the website.
- Deployed servers using *nginx*, *gunicorn*, and *Cloudflare*, effectively managing the infrastructure to handle concurrent traffic of up to 5,000 users. It ensured a smooth and uninterrupted user experience even during peak traffic.

ASMI *May 2019 - March 2020*
Junior Researcher *Remote*

Researched comprehensively on two-dimensional *In-Video Advertising*, focusing on enabling seamless advertisement integration within platform videos without disrupting the viewing experience.

Education

Bachelor in Computer Engineering *November 2017 - April 2022*
Pulchowk Campus, Institute of Engineering, Tribhuvan University *Lalitpur, Nepal*

Academic Supervisor: Aman Shakya, Ph.D.
Capstone Project: Epidemiological Surveillance System using NLP

- Attained **Rank 1 in the Entrance Exam** of 2074 B.S. (2017 A.D.) out of nearly 18,000 candidates.
- Graduated with **First Division honors**, achieving an impressive **aggregate of 79.96%**.

High School *June 2015 - June 2017*
SOS Hermann Gmeiner School Bharatpur *Bharatpur, Nepal*

- Graduated in the **top 5 of the class**, demonstrating exceptional academic performance.
- Attained a distinction with an impressive **85.3% aggregate**, reflecting a strong commitment to excellence throughout high school.
- Maintained high grades consistently and showcased diligence in academic pursuits.

Internships

NepAl Applied Mathematics and Informatics Institute for research (NAAMII) *August 2021 - April 2022*
Research Intern *Supervisor: Bishesh Khanal, Ph.D.*

- Researched tweet classification for my *Bachelor's final year project thesis.*
- Developed a classification system to *categorize tweets into* 8 *inclusive COVID-related categories.*
- Applied analytical techniques and data processing methods for accurate classification results.

Diyo.AI *June 2020 - December 2020*
NLP Research Intern *Supervisor: Binod Bhattarai, Ph.D.*

- Conducted extensive research on the availability of *Nepali language corpora*, resulting in a substantial corpus measuring nearly 3 GB in size.
- Leveraged the *Huggingface* transformers library to train an *ALBERT* language model specifically tailored for the Nepali language.

Publications

Workshop Paper **Adhikari, Rabin**, Safal Thapaliya, Nirajan Basnet, Samip Poudel, Aman Shakya, and Bishesh Khanal. "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. 2022.

Journal Paper Buddhacharya, Sangam Man, **Rabin Adhikari**, Nischal Maharjan, and Sanjeeb Prasad Panday. "Monocular Depth Estimation using a Multi-grid Attention-based Model." *Journal of Innovative Image Processing* 4, no. 3 (2022): 127-146.

Projects

Vision Language Model for Interpretable Medical Image Segmentation

- Developed a novel approach utilizing *multi-modal vision-language models* to extract semantic information from image descriptions and images, enabling accurate segmentation of diverse medical images.
- Conducted extensive evaluations of existing vision language models on multiple datasets, assessing their *applicability and transferability to the medical domain.*
- Explored the impact of variations in image descriptions on model performance, revealing valuable insights into the model's responsiveness to different prompts.

Abusive Nepali Text Detection to Support IPV Research

- Implemented an *advanced system for detecting abusive texts in extensive online content*, mainly social media platforms, to aid in research on Intimate Partner Violence (IPV).
- Created a comprehensive dataset and *developed a MuRIL-based deep learning classification model* explicitly tailored to the Nepali language.
- Designed and built an interactive dashboard that enables gradual learning and visualizes various aspects of abusive texts.

Standard Plane Navigation using Fetal Ultrasound Description

- Leveraged *vision-language models* to establish a connection between textual descriptions and ultrasound (US) images for standard plane navigation.
- Curated a dataset featuring text descriptions for each US image, showing the landmarks and artifacts.
- Aiming to aid novice radiologists in quickly navigating to the correct standard planes while reducing variance among expert radiologists.

Licenses and Certifications

DeepLearning.AI	Generative Adversarial Networks (GANs) Specialization
DeepLearning.AI	Natural Language Processing Specialization
DeepLearning.AI	AI for Medicine Specialization
DeepLearning.AI	TensorFlow Developer Professional Certificate
DeepLearning.AI	TensorFlow: Data and Deployment Specialization
University of Michigan	Applied Data Science with Python Specialization
Imperial College London	Mathematics for Machine Learning Specialization
Stanford University	Machine Learning

Technical Skills

- Adept in *Python*, including machine learning and deep learning libraries such as *Numpy*, *Pandas*, *Scikit-Learn*, *TensorFlow*, and *PyTorch*.
- Experienced in server-side programming using *Node.js* frameworks like *Express*, as well as *Python* frameworks like *Django*, *Flask*, and *FastAPI*.
- Proficient in working with various *SQL* and *NoSQL* databases.
- Skilled in client-side programming using *JavaScript* and *TypeScript*, along with frameworks like *React*.
- Well-versed in Linux environment, possessing skills in tools like *Vim*, *Tmux*, and *shell scripting*, with experience across different *Linux* distributions.
- Knowledgeable in *version control* systems, specifically *Git*.

Affiliations

LOCUS *March 2021 - May 2022*
Software Coordinator *Lalitpur, Nepal*

- Managed software events, effectively overseeing all aspects of planning and execution while ensuring seamless coordination and timely resolution of various technical issues.
- Demonstrated strong organizational skills by successfully organizing approximately 10 software events, handling logistics, scheduling, and ensuring a smooth and engaging participant experience.

IEEE Pulchowk Student Branch *February 2020 - December 2020*
Event Chair *Lalitpur, Nepal*

- Conducted a Tech Talk titled *A Platform for Innovations and Ideas* with CEOs from Yatri Motorcycles and International Green Developers Nepal as speakers, drawing an audience of approximately 200 participants.
- Organized a successful blood donation program in collaboration with the Nepal Red Cross Society, demonstrating effective coordination and execution skills.

Teaching Assistantships

Fourth Annual Nepal AI School *May 22 - June 1, 2023*
Kathmandu, Nepal

- Assisted in lab sessions on *Probability and Statistics*, *Transformers*, and *Natural Language Processing (NLP)*, facilitating effective learning and practical applications for about 150 participants.
- Collaborated with *Danda Pani Paudel, Ph.D.*, *Nripesh Parajuli, Ph.D.*, and *Abhinav Joshi* for the refinement of lab materials and exercises, ensuring an optimal learning environment.
- Developed effective communication and teamwork skills through collaboration with esteemed experts and fellow teaching assistants.

Third Nepal Winter School in AI *December 20 - 30, 2021*
Bhaktapur, Nepal

- Assisted in the *ML fundamentals* lab and guided participants through a project on *Generative Adversarial Networks (GANs)*, for about 100 participants.
- Prepared engaging lab sessions and projects with *Danda Pani Paudel, Ph.D.*, *Nripesh Parajuli, Ph.D.*, and *Sandesh Ghimire, Ph.D.*, showcasing effective mentorship and guidance skills.

References

1. **Bishesh Khanal, Ph.D.**

   Director/Research Scientist, *NepAl Applied Mathematics and Informatics Institute for research (NAAMII)*
   Email: `bishesh.khanal@naamii.org.np`

2. **Aman Shakya, Ph.D.**

   Assistant Professor, *Pulchowk Campus, Institute of Engineering, Tribhuvan University, Nepal*
   Email: `aman.shakya@ioe.edu.np`