

Prashant Shrestha

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EDUCATION

Bachelors in Electronics, Communication and Information Engineering 2018-2023

Pulchowk Campus, Institute of Engineering

Lalitpur, Nepal

Courses: Artificial Intelligence, Data Science, Data Mining, Database Management Systems, Big Data, Data Structures and Algorithms

- Ranked 82 in entrance exam out of nearly 18000 applicants (**top 0.5%**)
- Graduated with **Distinction**, scoring 82.05%

PREPRINTS AND PUBLICATIONS

- **CAR-MFL: Cross-Modal Augmentation by Retrieval for Multimodal Federated Learning with Missing Modalities.** [Paper]
Poudel, P, **Shrestha, P.***, Amgain, S.*, Shrestha Y. R., Gyawali P. K. & Bhattarai. B. (**MICCAI**), 2024
- **Investigating the Robustness of Vision Transformers against Label Noise in Medical Image Classification.** [Paper]
Khanal, B., **Shrestha, P.***, Amgain, S.*, Khanal, B., Bhattarai, B., & Linte, C. A. (**EMBC**), 2024
- **Investigation of Federated Learning Algorithms for Retinal Optical Coherence Tomography Image Classification with Statistical Heterogeneity.** [Paper]
Amgain, S.*, **Shrestha, P.***, Bano, S., Torres, I. D. V., ... & Bhattarai, B. In (**IPCAI Long Abstract**), 2024
- **Cross-modal Contrastive Learning with Asymmetric Co-attention Network for Video Moment Retrieval.** [Paper]
Panta, L.*, **Shrestha, P.***, Sapkota, B., Bhattarai, A., Manandhar, S., & Sah, A. K. (**WACV Workshop on Pretraining**), 2024
- **Medical vision language pretraining: A survey.** [Paper]
Shrestha, P.*, Amgain, S.*, Khanal, B., Linte, C. A., & Bhattarai, B. *arXiv preprint*, 2023

RESEARCH EXPERIENCE

Research Assistant

June 2023 - Present

Multimodal Learning Lab — Advisor: Dr. Binod Bhattarai

University of Aberdeen, UK & NAAMII

- Studied learned masking for Multimodal Masked Auto-Encoder for medical vision language pretraining.
- Conducted an extensive survey on medical vision language pretraining approaches identifying current trends, available datasets and challenges [5].
- Investigated the effectiveness of different federated learning approaches for OCT image classification.
- Assisted team on investigating the impact of different self-supervised pretraining approaches with transformer-based architecture for robust medical image classification with label noise.
- Assisted team on developing a novel method for handling missing modality in multimodal federated setting with medical datasets using intra-modal retrieval.
- Led a project on developing method to handle label noise in federated learning utilizing regularization from pretrained SSL encoders.

NLP Research Intern

Oct 2022 - April 2023

NAAMII — Advisor: Dr. Bishesh Khanal

Lalitpur, Nepal

- Reviewed state-of-the-art Nepali NLP literature in the domain of neural machine translation and anaphora resolution tasks
- Performed in-depth exploratory data analysis on publicly available datasets for Nepali machine translation, studying their features and limitations

TEACHING EXPERIENCE

Teaching Assistant

Jan 2024

AI4Growth, Nepal

- Designed and conducted lab sessions on supervised learning and natural language processing
- Guided students through capstone project on *Sentiment Analysis using BERT*

Teaching Assistant

May 2023

4th Annual AI School, Nepal

- Provided hands-on guidance and technical assistance in lab session on supervised learning

Instructor

December 2022

Software Fellowship, LOCUS 2023

- Prepared and delivered lecture on basics of python programming

PROFESSIONAL SERVICE

Reviewer, Workshop on Data Engineering in Medical Imaging, MICCAI, 2024

INDUSTRY EXPERIENCE

Machine Learning Engineer

June 2023 - Present

BaseGTX, UK

part-time, Remote

- Involved in development of algorithms for retinal diseases diagnosis
- Working on analyzing and predicting disease causing genetic variants using AI

AWARDS AND ACHIEVEMENTS

Scholarship, NAAMII 4th Annual AI School Scholarship

2023

Scholarship, Fusemachines AI Fellowship

2023

Award, Second Runner up at SmartBots Coding Challenge

2023

Involved creating an efficient game playing bot for a card game, competition involved 94 teams nationwide

Award, First Runner up at Global Coding Challenge(Rest Of the World Division) by Credit Suisse

2022

Global Rank 26 out of 2000+ participants globally, involved providing efficient solutions to programming challenges

Award, First Runner up at OpenIMIS-DRG Datathon organized by CARD, IOE

2022

Involved mapping Thai DRG and OpenIMIS database fields

Award and Scholarship, Ncell Academic Excellence Award by Ncell

2020

Awarded for achieving highest scores for the freshmen year in the department

Scholarship, Received stipend each semester for securing top 24 position in class

2018-2023

Scholarship, Golden Jubilee Scholarship by Indian Embassy

2018-2023

Scholarship, Merit-based full tuition waiver based on entrance exam ranking

2018-2023

ACADEMIC PROJECTS

Natural Language Query Grounding in Video, — *Graduating Capstone Project* [\[PDF\]](#)

March 2023

- Involved experimenting with different multi-modal transformer architectures to perform temporal localization in a video using a text query
- Built a web UI for visualization and inference using Flask.
- Improved results over baseline; resulted in a publication at WACV workshop on pretraining, 2024

Capture The Flag game using Multi-agent RL, — *Minor Capstone Project* [\[PDF\]](#)

March 2022

- Involved developing multi-agent reinforcement learning algorithms to solve Capture the Flag game inside Unity's dodgeball environment
- Utilized a self-play variation of MADDPG for multi-agent training
- Designed curriculum to perform training in multiple stages.

SKILLS SUMMARY

Languages: C++, Python, C, SQL

Machine Learning: Multimodal Learning, Federated Learning, Computer Vision

Frameworks: Pytorch, Pandas, Numpy, Matplotlib, Scikit-Learn, Django

Skills: Probability Theory, Web Design, Microsoft Excel, Microsoft Office

Tools: Git, Github, LaTeX, WandB, NeptuneAI, Slurm