

PARIBESH REGMI

Graduate Research Assistant — Rochester Institute of Technology
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EDUCATION

Computing and Information Science <i>PhD Degree</i> <i>Advisor: Prof. Rui Li</i> Relevant courses: Statistical Machine Learning, Deep Learning, Deep Learning Security, Foundations of Algorithms, Software Engineering	<i>Rochester Institute of Technology</i> 08/2021 - Present
Electronics and Communication Engineering <i>Bachelor's degree</i> Thesis: Nepali Speech Recognition Using RNN-CTC Model	<i>IOE, Tribhuvan University</i> 2014 - 2018

WORK EXPERIENCE

Lab of Use-Inspired Computational Intelligence (LUCI) <i>Graduate Research Assistant</i>	<i>2021 - Present</i> <i>Rochester, New York</i>
Amazon.com Inc. <i>Applied Science Intern</i>	<i>Jun - Sep 2025</i> <i>Santa Cruz, California</i>
LogPoint <i>Solutions Engineer</i> <ul style="list-style-type: none">Solved system/software issues at the customer's end.Troubleshooted/maintained system and software associated to cybersecurity, networking, Linux, user and entity behavior analysis (UEBA).	<i>2018 - 2021</i> <i>Lalitpur, Nepal</i>

RESEARCH INTERESTS

Machine Learning, Deep Learning, Bayesian Methods, Generative Models - (VAE, Diffusion/Flow Models), Graph Neural Networks, Vision-Language Models (VLMs)

PAPERS/PUBLICATIONS

Enhancing Shortcut Models with Cumulated Self-Consistency Loss for One Step Diffusion
Paribesh Regmi; Sandesh Ghimire; Rui Li
Under Review

Bayesian Neighborhood Adaptation for Graph Neural Networks
Paribesh Regmi; Rui Li; Kishan KC
Transactions of Machine Learning Research (TMLR), 2025

AdaVAE: Bayesian Structural Adaptation for Variational Autoencoders
Paribesh Regmi; Rui Li
Thirty-Seventh Conference on Neural Information Processing Systems (NeurIPS), 2023

Predicting Biomedical Interactions with Probabilistic Model Selection for Graph Neural Networks
Kishan KC; Rui Li; Paribesh Regmi; Anne Haake
arxiv.org

Nepali Speech Recognition Using RNN-CTC Model
Paribesh Regmi; Arjun Dahal; Basanta Joshi
International Journal of Computer Applications, 2019

RESEARCH/PROJECTS

Adaptive Token Pruning for Efficient Inference in Video-Language Models Summer Internship 2025

- Developed an algorithm to efficiently process video inputs in vision-language models by reducing the number of visual tokens for LLM to process.
- The algorithm prunes out the redundant visual tokens in two stages: frame and token-level pruning. We also determine the number of tokens to prune based on the dynamism in the video content.
- This allows the deployment of VLMs in low-resource edge devices.

Efficient Sampling in Diffusion Generative Models

2024 - Present

- Developing algorithm to improve sampling efficiency in diffusion-based generative models.
- The algorithm allows training for a few-step denoising along with the base diffusion model in a single training pass.

Representation learning on graphs

2022 - 2024

- Applying Bayesian model selection to enhance graph representations by inferring appropriate neighborhood scope for message aggregation in a graph convolutional network (GCN).
- Using graph characteristics to infer the most plausible set of neighbors for message aggregation in a GCN.
- Expressivity analysis shows that our approach improves the expressivity of a GCN with larger layer depth.

Bayesian model selection in VAE

2022 - 2023

- Developing a Bayesian model selection framework to infer an optimal model structure in variational autoencoders, guided by the data
- The framework eliminates the need to fine-tune network complexity for the encoding and decoding networks
- The framework is compatible with the state-of-the-art VAE regularization methods as well as various VAE variants, further improving their performance

Leveraging deep learning in graphs for biomedical interaction prediction

2021 - Present

- Application of developed graph algorithms to real-world biomedical scenarios, like inferring the interactions in the datasets like PPI(Protein-Protein Interaction), DTI(Drug-Target Interaction), etc.

Nepali Speech Recognition

2018 - 2019

- Application of deep learning to enhance the Nepali speech recognition system, transitioning from a limited vocabulary size to a large corpus. Connectionist Temporal Classification (CTC) loss aided in enabling end-to-end training of the recurrent neural network model.
- Defined a Nepali language character set of 67 characters.

AWARDS

Fully funded Ph.D./ Research Assistantship at RIT

2021 - Present

Full financial support for my Ph.D. from NSF grants

Fusemachine AI Fellowship Award

2017 - 2018

Fellowship offered by Fusemachines (fusemachines.com) for AI and Machine Learning study

Full Scholarship for Bachelor's in Engineering

2014 - 2018

Ranked 28th among 13,000 applicants in the engineering entrance examination to gain a full scholarship

SKILLS

Programming

General: Python, moderate expertise in Java and C++; **ML and DL:** pytorch, scikit-learn, numpy; **Visualization:** matplotlib

Troubleshooting

Solving system(Linux) and software related issues. Three years of work experience in troubleshooting.

Leadership

Former event manager at Nepalese Student Association, Rochester Institute of Technology (NSA-RIT)