

# PARIBESH REGMI

Graduate Research Assistant — Rochester Institute of Technology

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## EDUCATION

### Computing and Information Science

Rochester Institute of Technology

PhD Degree

2021 - Present

Advisor: Prof. Rui Li

**Relevant courses:** Statistical Machine Learning, Deep Learning, Deep Learning Security, Foundations of Algorithms, Software Engineering

### Electronics and Communication Engineering

IOE, Tribhuvan University

Bachelor's degree

2014 - 2018

**Thesis:** Nepali Speech Recognition Using RNN-CTC Model

## WORK EXPERIENCE

### Lab of Use-Inspired Computational Intelligence (LUCI)

2021 - Present

Graduate Research Assistant

Rochester, New York

### LogPoint

2018 - 2021

Solutions Engineer

Lalitpur, Nepal

- 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).

## RESEARCH INTERESTS

Statistical Machine Learning, Deep Learning, Bayesian Methods, Deep Graph Learning, Generative Models - (VAE, Diffusion Models, Flow Matching), Graph Generation

## PUBLICATIONS

### 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

### Graph Generation with Flow Matching

2024 - Present

- Developing efficient graph generative model by generating its Eigen properties via flow matching

### 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

## 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.

## 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 28<sup>th</sup> 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)

### Languages

Nepali, English (Speaking, Reading, Writing)