

# PARIBESH REGMI

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## EDUCATION

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

## WORK EXPERIENCE

<b>Lab of Use-Inspired Computational Intelligence (LUCI)</b> <i>Graduate Research Assistant</i>	<i>2021 - Present</i> <i>Rochester, New York</i>
<b>Amazon.com Inc.</b> <i>Applied Science Intern</i>	<i>Jun - Sep 2025</i> <i>Santa Cruz, California</i>
<b>LogPoint</b> <i>Solutions Engineer</i> <ul style="list-style-type: none"><li>Solved system/software issues at the customer's end.</li><li>Troubleshooted/maintained system and software associated to cybersecurity, networking, Linux, user and entity behavior analysis (UEBA).</li></ul>	<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*  
*International Conference on Learning Representations (ICLR), 2026*

**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

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### **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

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### **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

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### **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)