



Ruby Shrestha

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Research Interests

Deep Generative Models; Causal Modeling and Reasoning; Robust Learning under Correlated Attributes; Fairness, Distributional Robustness, and Trustworthy AI

Education

PhD, Computing and Information Sciences 2022–Present
Rochester Institute of Technology (RIT), Rochester, NY, USA GPA: 4.00/4.00
Advisor: Dr. Linwei Wang
Relevant Courses: Quantitative Foundations, Deep Learning, Statistical Machine Learning, Non-convex Optimization, Data Science & Analytics, Visual Analytics

B.Sc., Computer Science and Information Technology 2013–2017
Tribhuvan University, Nepal 84.14%

Technical Skills

Programming: Python, SQL
Machine Learning: PyTorch, Scikit-learn, NumPy, Pandas
Deep Learning / Research: Diffusion Models, Generative Models, Causal Modeling, Interventional and Counterfactual Generation
Experiment Tracking: Weights & Biases, MLflow
Data Systems: MySQL, Elasticsearch
Visualization: Tableau, Looker Studio
Tools / Platforms: Git, Linux, Mac OS, Windows

Research Experience

Graduate Research Assistant 2022–Present
Computational Biomedicine Lab, Rochester Institute of Technology, Rochester, NY, USA

- Developed deep generative modeling method for robust image generation under correlated attributes in the training distribution, leading to a first-author publication at ICLR 2026.
- Researching causal and generative modeling methods for robust machine learning under correlated attributes, enabling reliable generation for underrepresented subgroups and rare scenarios, with applications in interventional and counterfactual reasoning, fairness, and Trustworthy AI.

Independent Research Study as Alumna 05/2018–08/2018
Deerwalk Institute of Technology, Tribhuvan University, Nepal

- Empirically assessed a mixed-model path-finding approach combining irregularities-tolerant dead-end filling with A* search for convoluted maze paths.

Research Assistant 03/2017–05/2017
Deerwalk Institute of Technology, Tribhuvan University, Nepal

- Studied student perspectives on the use of blended learning pedagogy at Deerwalk Institute of Technology.

Publications

ProReGen: Progressive Residual Generation under Attribute Correlations

R. Shrestha, A. Gopi, C. Meisenzahl, B. Lekhak, L. Wang

International Conference on Learning Representations (ICLR), 2026. Conference Article.

DATS: Difficulty-Aware Task Sampler for Meta-Learning Physics-Informed Neural Networks

M. Toloubidokhti, Y. Ye, R. Missel, X. Jiang, N. Kumar, R. Shrestha, L. Wang

International Conference on Learning Representations (ICLR), 2024. Conference Article.

Distributionally Robust Optimization and Invariant Representation Learning for Addressing Subgroup Underrepresentation: Mechanisms and Limitations

N. Kumar*, R. Shrestha*, Z. Li, L. Wang

*Equal contribution

Fairness of AI in Medical Imaging (FAIMI @ MICCAI), 2023. Workshop Article.

Maze Solving with Anomaly Tolerant Dead End Filling and A*: Implementation and Analysis

R. Shrestha

Deerwalk Journal of Computer Science and Information Technology, 2019. Journal Article.

Manuscripts in Progress

Re-Examining the Impact of Observed Feature Correlations on Minority Image Generation

R. Shrestha, N. Kumar, A. Gopi, B. Lekhak, L. Wang

Industry Experience

Software Consultant

04/2021–07/2022

Saugal Trading Company Pvt. Ltd., Nepal

Senior Software Engineer, Development Manager

01/2021–03/2021

Software Engineer, Team Lead

04/2019–01/2021

Software Engineer

05/2018–03/2019

Software Engineering Intern

09/2015–04/2018

Deerwalk Services Pvt. Ltd. / Cedar Gate Technologies

- Worked on Deerwalk Plan Analytics, a healthcare analytics product supporting descriptive, prescriptive, and trend-based reporting.
- Led and contributed to projects optimizing Elasticsearch queries and extracting healthcare data from Elasticsearch clusters.
- Built data pipelines and analytics workflows for industry-standard healthcare reports and visualizations.
- Progressed from Software Engineering Intern to Software Engineer, Team Lead, and Development Manager, demonstrating long-term technical and leadership growth.

Honors & Awards

- Dr. Russell & Melissa Bessette Award for Doctoral Student Excellence, RIT (2023)
- National Female Education Award, Government of Nepal (2019)
- Winner, International Girls in ICT Day Hackathon (2016)
- Outstanding Cambridge Learners Award – Top in Country (2013)

Poster Presentations

ProReGen: Progressive Residual Generation under Attribute Correlations

The Fourteenth International Conference on Learning Representations, 2026

Conference Presentations

Maze Solving with Anomaly Tolerant Dead End Filling and A*: Implementation and Analysis

The Fifth International Conference on Information Technology for Development, 2018

Blended Learning in DWIT College: From Learners Perspective

The Fourth International Conference on Information Technology for Development, 2017

Teaching Experience

Workshop Instructor

01/2019–03/2019

Deerwalk Institute of Technology, Tribhuvan University, Nepal

- Instructed a workshop on fundamental concepts of data management and analysis with Elasticsearch.

Guest Trainer

07/2018

Local Development Training Academy, Nepal

- Delivered a three-day hands-on training program on cloud services, content management systems, and project management tools.

Guest Trainer

07/2016

Local Development Training Academy, Nepal

- Delivered a three-hour interactive training session on mobile application usage, security, and earning.