

Amit Roy

Lafayette, Indiana, USA

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Education

Purdue Univeristy

Graduate Student in Computer Science (Offered Ross Fellowship)
Current CGPA: 3.64/4.0 (MS Requirement Completed) | [Grad School Webpage](#)
Research Focus: Deep Learning, Graph Machine Learning, Large Language Models

West Lafayette, Indiana, USA

August 2022 - Present

Univeristy of Dhaka

B.Sc in Computer Science and Engineering | Undergraduate Curriculum
CGPA: 3.96 out of 4.00 (Class Rank: 1st out of 65 students)
Thesis Topic: Utility-based Graph Mining
Supervisor: Dr. Chowdhury Farhan Ahmed

Dhaka, Bangladesh

January 2016 - January 2020

Professional Experience

Purdue Computer Science

Graduate Research and Teaching Assistant

Worked on the Graph Anomaly Detection problem and published papers using *Neighborhood Reconstruction* and *Subgraph Score-Matching-based Energy-based Models* training funded by **Sony, Belgium**, and served as a teaching assistant in undergrad and grad level Machine Learning courses at Purdue CS | Advisor: Prof. Pan Li

West Lafayette, Indiana, USA

August 2022 - Present

Artificial Intelligence and Cybernetics Lab, Independent University Bangladesh

Research Assistant - Machine Learning on Graphs

Developed GNN-based models for spatiotemporal traffic forecasting, node classification, and graph classification tasks supported by ICT Division, Government of Bangladesh. Advisors: Dr. Amin Ahsan Ali and Dr. AKM Mahbubur Rahman

Dhaka, Bangladesh

February 2020 - June 2022

Tiger IT Bangladesh Ltd.

Software Engineer - Machine Learning

Worked as a backend developer on applied computer vision projects from real-time video data e.g. Automated Number Plate Recognition and object detection.

Dhaka, Bangladesh

December 2020 - August 2022

Research Projects

GAD-NR: Graph Anomaly Detection via Neighborhood Reconstruction

Amit Roy, Juan Shu, Jia Li, Carl Yang, Olivier Elshocht, Jeroen Smeets, Pan Li

The 17th ACM International Conference on Web Search and Data Mining (WSDM-2024) [[Paper](#)] [[Code](#)] [[PyGOD](#)]

March 2024

GAD-EBM: Graph Anomaly Detection using Energy-Based Models

Amit Roy, Juan Shu, Olivier Elshocht, Jeroen Smeets, Ruqi Zhang, Pan Li

New Frontiers in Graph Learning (GLFRONTIERS), NuerIPS Workshop 2023 [[Paper](#)]

December 2023

Before Joining Purdue CS:.....

Unified Spatio-Temporal Modeling for Traffic Forecasting using GNN

Amit Roy*, Kashob Kumar Roy*, Amin Ahsan Ali, M Ashraful Amin and A K M Mahbubur Rahman

The International Joint Conference on Neural Networks (IJCNN-2021) [[Paper](#)] [[Code](#)]

April 2021

SST-GNN: Simplified Spatio-temporal Traffic forecasting model using Graph Neural Network

Amit Roy*, Kashob Kumar Roy*, Amin Ahsan Ali, M Ashraful Amin and A K M Mahbubur Rahman

The 25th Pacific-Asia conference on Knowledge Discovery and Data Mining (PAKDD-2021) [[Paper](#)] [[Code](#)]

February 2021

Node Embedding using Mutual Information and Self-Supervision based Bi-level Aggregation

Kashob Kumar Roy*, **Amit Roy***, Amin Ahsan Ali, M Ashraful Amin and A K M Mahbubur Rahman

The International Joint Conference on Neural Networks (IJCNN-2021) [[Paper](#)] [[Code](#)]

April 2021

Structure-Aware Hierarchical Graph Pooling using Information Bottleneck

Kashob Kumar Roy*, **Amit Roy***, Amin Ahsan Ali, M Ashraful Amin, and A K M Mahbubur Rahman

The International Joint Conference on Neural Networks (IJCNN-2021) [[Paper](#)] [[Code](#)]

April 2021

Mining High Utility Subgraphs

Md. Tanvir Alam, **Amit Roy**, Chowdhury Farhan Ahmed, Md. Ashraful Islam, Carson K. Leung

UDML 2021: 4th Workshop on Utility Driven Mining and Learning @ ICDM 2021 [[Paper](#)] [[Code](#)]

September 2021

UGMINE: Utility-based Graph Mining

Md. Tanvir Alam, **Amit Roy**, Chowdhury Farhan Ahmed, Md. Ashraful Islam, Carson K. Leung

Applied Intelligence Journal, Impact Factor: 5.086 [[Paper](#)] [[Code](#)]

February 2022

* indicates Equal Contribution

Academic Projects

Hierarchical Clustering to classify images generated from Multi-generator GAN August 2023 - December 2023
Combined hierarchical clustering with multi-generator GAN architecture to classify images. [[Project Report](#)] [[Presentation](#)] [[Code](#)]

Impact of Large Language Models in DBMS August 2023 - December 2023
Investigated SOTA models and evaluated the performance of LLM for DBMS tasks e.g. text-to-SQL, query disambiguation. [[Presentation](#)]

Investigating Knowledge Graph Completion with Pre-trained Language model and GNN January 2023 - April 2023
Developed architecture with pre-trained word embeddings from BERT and Relational Graph Convolutional Network (RGCN) for link prediction in knowledge graphs. [[Presentation](#)] [[Code](#)]

Exploring the loss landscape of self-supervised learning with MCMC sampling January 2023 - April 2023
Employed Hamiltonian Monte Carlo MCMC sampling algorithm to find a potential fragility in the optimization of a state-of-the-art self-supervised learning method Simsim [[Project Report](#)] [[Presentation](#)]

iGest Recognito : Mobile App for sign language based communication July 2017 - November 2017
Developed an android application as a communication medium between regular text messaging and sign language, awarded as the Champion at **DUITS-ROBI National IT Fest, 2018 (Results)** and presented as a poster in **International conference on Emerging technologies in data Mining and Information Security(IEMIS), 2018** in Kolkata, India. [[Poster Link](#)] [[Demo Video](#)] [[Code](#)]

Technical Skills

Programming Languages:	Python, C++, C, Java
Data Science Tools:	PyTorch, NumPy, Scikit-Learn, Matplotlib, NetworkX, OpenCV, PyGOD
Web Development:	FrontEnd - HTML, JavaScript BackEnd - Flask, MySQL, MongoDB
Miscellaneous:	Git, \LaTeX

Courseworks and Problem Solving

- o **Related Courses:**
 - Computation & Machine Learning over Graphs, Deep Learning, Data Mining, Statistical Machine Learning, Natural Language Processing, Artificial Intelligence, Algorithm Design, Analysis, and Implementation, Database Systems, Mathematical and Statistical Analysis for Engineers, Linear Algebra, Introduction to Probability and Statistics
- o **Problem Solving**
 - Solved 1000+ problems in different Online Judges including Codeforces, Codechef, and UVA.
 - Reached Expert (Rating 1640) in Codeforces and 5* (Rating 2160) in Codechef, username: *amitroy7781*.

Teaching Experinence

- o Teaching Assistant - Department of Computer Science, Purdue University
 - CS 37300 : Data Mining and Machine Learning, Spring 2024
 - CS 57800 : Statistical Machine Learning, Fall 2023

Awards and Achievements

- o 2022: **Ross Fellowship** by Purdue University for outstanding graduate student.
- o 2022: **"University Grants Commission of Bangladesh Scholarship"** for the first position in the Faculty of Engineering and Technology, University of Dhaka [[Certificate](#)]
- o 2022: **"Professor Dr. M Lutfur Rahman Award"** for securing the highest CGPA in the Bachelor of Science Examination of 2019 in Computer Science and Engineering, University of Dhaka. [[Certificate](#)]

References

Dr. Pan Li
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Computer Science, Purdue University,
West Lafayette, Indiana, USA
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Dr. Amin Ahsan Ali
Associate Professor
Department of Computer Science and Engineering
Independent University, Bangladesh
Email: aminali@iub.edu.bd | [Homepage](#)

Dr. A K M Mahbubur Rahman
Assistant Professor
Department of Computer Science and Engineering
Independent University, Bangladesh
Email: akmmrahman@iub.edu.bd | [Homepage](#)

Dr. Chowdhury Farhan Ahmed
Professor
Department of Computer Science and Engineering
University of Dhaka, Bangladesh
Email: farhan@du.ac.bd | [Homepage](#)