Muhammad Sohel Rana

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Objective

Apply my expertise in machine learning, data science and scalable optimal transport to develop innovative and scalable solutions in an industrial focused research role.

Education

Ph.D. candidate, Mathematics and Data Science, The University of Texas at Arlington, USA   Expected: 2025
Research : Manifold learning, optimal transport, scalable optimal transport, dimensionality reduction.

Experience

Graduate Research Assistant, UT Arlington, USA   June 2023 – Present
  ◇ Improved manifold learning techniques implemented for supervised and unsupervised machine learning.
  ◇ worked in a capstone project as a group leader of undergraduate students of the division of data science.

Graduate Teaching Assistant, UT Arlington, USA   September 2019-May 2021, September 2022 - May 2023
  ◇ Mentoring student in the interactive problem solving session, provided guidance during weekly projects, handling grading on technology (canvass, blackboard)

Lecturer
Department of Mathematics and Physics, North South University, Bangladesh
January 2022 - August 2022
  ◇ Taught precalculus and Calculus and Analytic Geometry-I to 360+ students in 9 sections.

Graduate Teaching Assistant, Western Kentuck University, USA   August 2015 - December 2015
 Senior Officer, Pubali Bank Limited,Bangladesh   June 2012- July 2015

Technical skills

Languages: Python, LaTeX, Mathematica, C, Fortran
Tools: Numpy, Pandas, scikit-learn, keras, Pytorch, Tensorflow, NLTK, Matplotlib, PostgreSQL

Expertise: Computer vision, NLP, Manifold learning techniques, supervised and unsupervised machine learning

Publications

◇ **Muhammad Rana**, Phuong Trinh, Ryan Bui, Keaton Hamm. "Optimal transport based dimensionality reduction." (Submitted)

◇ Zahidur Talukder, **Muhammad Rana**, Keaton Hamm, Mohammad A. Islam. "Empowering Clients: Self-Adaptive Federated Learning for Data Quality Challenges." *IEEE International Conference on Edge Computing and Communications, 2025*

manuscripts in preparation

◇ **Muhammad Rana**, Keaton Hamm. "Unbalanced Optimal transport based dimensionality reduction."

◇ Md. Mehedi Hasan, Mohammad Abdul Halim, **Muhammad Rana**, Salma Yeasmin Jannaty, M. J. Uddin. "Analysis of Natural Convection Nanofluid Flow in Annular Regions Bounded by a Trapezoidal Outer Wall and Inner Wall Configurations of Triangular, Circular, and Square Geometries: A Comparative Study"

◇ Md Abul Hossain Mamun, **Muhammad Rana**. Factors Influencing women's total children ever born and current contraceptive use in urban and rural areas: Evidence from BDHS 2017-18

Recognition

◇ **Math Academic Excellence Scholarship**, Mathematics Department, The University of Texas at Arlington, 2025.

◇ **Glenn and Virginia Powers Memorial Scholarship**, Mathematics Department, Western Kentucky University, 2016.
◇ **Honors Results Based Merit Scholarship**, Fazlul Huq Muslim Hall, Dhaka University, 2010.