

Muhammad Sohel Rana

Department of Mathematics
University of Texas at Arlington
411 S Nedderman Dr, PKH, 4th Floor, Arlington, TX
76019

muhammadsohel.rana@mavs.uta.edu
LinkedIn | GitHub | Google Scholar
(682)-376-4133

EDUCATION

Ph.D. Candidate, Mathematics-Data Science (jointly with Computer Science and Engineering department),
University of Texas at Arlington - Expected: May 2026

◇ Supervisor: Keaton Hamm

M.S. Mathematics, Western Kentucky University - 2017

◇ Supervisor: Mark Robinson

M.S. Applied Mathematics, Dhaka University - 2008

B.S. Mathematics, Dhaka University - 2007

◇ Project supervisor: Dr. Mohammad Ferdows

EMPLOYMENT

June 2023 – Present Graduate Research Assistant, University of Texas at Arlington

Sep 2022 – May 2023 Graduate Teaching Assistant, University of Texas at Arlington

Jan 2022 – Aug 2022 Lecturer, North South University, Bangladesh

Sep 2019 – May 2021 Graduate Teaching Assistant, University of Texas at Arlington

Sep 2015 – Dec 2017 Graduate Teaching Assistant, Western Kentucky University

July 2012 - August 2015 Senior Officer, Pubali Bank Limited, Bangladesh

Jan 2012 - June 2012 Math Teacher, Bangladesh International School and College, Bangladesh

Jan 2011 - Dec 2011 Math Teacher, Bangladesh International Tutorial, Bangladesh

PUBLICATIONS

Manuscripts under review

- ◇ **Muhammad Rana**, Abiy Tasissa, HanQin Cai, Yakov Gavriylov, and Keaton Hamm, Recovering Wasserstein Distance Matrices from Few Measurements. (Submitted)
- ◇ **Muhammad Rana**, and Keaton Hamm, Neighbor Embeddings Using Unbalanced Optimal Transport Metrics. (Submitted)
- ◇ **Muhammad Rana**, Phuong Trinh, Ryan Bui, and Keaton Hamm, On Wasserstein distance neighbor embeddings. (Submitted)
- ◇ Md. Mehedi Hasan, Mohammad Abdul Halim, **Muhammad Rana**, Salma Yeasmin Jannaty, M. J. Uddin. Nanofluid Natural Convection in Trapezoidal Annuli: Comparative Effects of Triangular, Circular, and Square Inner Walls. (Submitted)
- ◇ 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. (Submitted)

Peer reviewed papers

- ◇ Zahidur Talukder, **Muhammad Rana**, Keaton Hamm, and Mohammad Islam, Empowering Clients: Self-Adaptive Federated Learning for Data Quality Challenges. (Approximately 11 pages, IEEE EDGE 2025)

A W A R D S

- ◇ Mathematics Academic Excellence Scholarship (University of Texas at Arlington)
 - ⊙ Awarded yearly to graduate students who have demonstrated academic excellence (out of approximately 70 graduate students.)
- ◇ Dr. R. Glenn and Virginia Powers Scholarship (Western Kentucky University)
 - ⊙ Awarded to the best return graduate student (out of approximately 10 graduate students.)
- ◇ Honors results-based merit scholarship (University of Dhaka)
 - ⊙ Awarded to the best 2-3 students in the Mathematics department resident in Fazlul Huq Muslim Hall based on honors results.)

P R E S E N T A T I O N S

Invited talks

- ◇ Empowering Clients: Self-Adaptive Federated Learning for Data Quality Challenges - Teatime event, Division of data science, University of Texas at Arlington, Arlington, TX, February 21, 2025.
- ◇ Optimal Transport-Based Dimensionality Reduction - CodEx student/postdoc series mini-conference 2025 (virtual), May 27, 2025

T E A C H I N G E X P E R I E N C E

UNIVERSITY OF TEXAS AT ARLINGTON

Graduate Teaching Assistant

MATH 1426, Calculus I - Fall 2019

MATH 2425, Calculus II - Sprint 2020, Fall 2020, Spring 2021, Fall 2022, Spring 2023

STATS 1308, Elementary Statistical Analysis - Summer 2020

NORTH SOUTH UNIVERSITY

Lecturer

Spring 2022

- ◇ MATH 116, PreCalculus (2 Sections): Developed lecture materials, assignments, final and midterm exams, and rubrics for grading from scratch. Delivered lectures to 80 students and received strong student evaluation from students (4.45 (very good) out of 5). Guided graduate teaching assistant for the courses.
- ◇ MATH 120, Calculus and Analytic Geometry-I (2 sections) Designed all instructional materials, assessment, and grading criteria for the course. Instructed and delivered lectures to a group of 80 students and achieved highly favorable feedback from the students about instructor (4.05 (very good) out of 5). Help the graduate teaching assistant to grade the homework assignments and grading policy.

Summer 2022

- ◇ MATH 116, Pre-Calculus (3 Sections) Mentored 120 students, developed all the questions for exams aligned with course objective and difficulty level. Guided graduate teaching assistant to grade homework assignments and grade policy.
- ◇ MATH 120, Calculus and Analytic Geometry-I (2 sections) Guided a cohort of 80 students, proctored all the exams, and handled the final grading submission.

WESTERN KENTUCKY UNIVERSITY

Graduate Teaching Assistant

MATH 136, Calculus I, Fall 2015

MATH 137, Calculus II, Spring 2016, Fall 2016, Spring 2017, Fall 2017

INDUSTRY EXPERIENCE

Senior Officer, Pubali Bank Limited, Bangladesh

June 2012 – July 2015

- ◇ Managed client portfolios and assisted in retail banking operations.
- ◇ Collaborated with loan and advance teams on loan disburse and recovery.

ACADEMIC SERVICES

Volunteering Experience

UTA Calculus Bowl, 2020, 2021, 2023, 2024: A dynamic playoff style quiz competition designs on precalculus and calculus for a group of teams, where each team consists of 3-5 students. The events feature multiple choice questions, displayed one at a time via projected system.

TECHNICAL SKILLS

Languages

- ◇ **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, Numerical Analysis

References

Dr. Keaton Hamm

Assistant Professor

Department of Mathematics

University of Texas at Arlington

Email: keaton.hamm@uta.edu

Dr. Mohammad Atiqul Islam

Assistant Professor

Department of Computer Science

University of Texas at Arlington

Email: mislam@uta.edu

Dr. Hristo V. Kojouharov

Professor

Department of Mathematics

University of Texas at Arlington

Email: hristo@uta.edu

Dr. Zahidur Talukder

Assistant Professor

Mathematics and Computer Science

Texas Lutheran University

Email: ztalukder@tlu.edu