Muhammad Rehman Zafar

Email: muhammadrehman.zafar@torontomu.ca | **Web:** https://rehmanzafar.github.io

Ted Rogers School of Information Technology Management, 350 Victoria Street Toronto, ON M5B 2K3

RESEARCH INTERESTS

Explainable Artificial Intelligence, Interpretable Machine Learning, Responsible AI

RESEARCH POSITIONS AND AFFILIATIONS

Toronto Metropolitan University

- **Research Cluster Lead** - Methods and Infrastructure Collaboration, Bridging Divides — Jan 2026 – present
- **Postdoctoral Research Fellow -** TMU Multimedia Research Laboratory — Jun 2025 – Jun 2026

EDUCATION

Doctor of Philosophy (PhD) Electrical and Computer Engineering — Oct 2024
Toronto Metropolitan University (formerly Ryerson University), Ontario, Canada
Dissertation Title: A framework to Interpret, Visualize and Analyze the decisions of black box models for trustworthy AI
Research Domains: Explainable Artificial Intelligence, Interpretable Machine Learning, Few-shot Learning
Advisor: Dr. Naimul Khan

Master of Science in Computer Science — Aug 2017
Bahria University, Islamabad, Pakistan
Dissertation Title: A Context-aware Approach to News Article Retrieval
Research Domains: Recommendation Systems, Natural Language Processing
Advisor: Dr. Arif-Ur-Rahman

Bachelor of Science in Computer Science
International Islamic University, Islamabad, Pakistan — Mar 2012
Thesis: Lungs Tumor Detection from CT Scan Images
Application Domains: Healthcare, Digital Image Processing, Machine Learning
Advisor: Dr. Ayyaz Hussain

ACADEMIC POSITIONS

Assistant Professor – Limited Term Faculty — Jul 2026 – Present
Ted Rogers School of Information Technology Management — Contract, Full-time
Toronto Metropolitan University, Canada

Contract Lecturer — Sep 2025 – Jun 2026
Electrical, Computer and Biomedical Engineering — Contract, Part-time
Toronto Metropolitan University, Canada

Postdoctoral Research Fellow — Jun 2025 – Jun 2026
Electrical, Computer and Biomedical Engineering — Contract, Full-time
Toronto Metropolitan University, Canada

Sessional Lecturer — Jan 2026 – Jun 2026
Master of Data Analytics — Contract, Sessional
University of Niagara Falls, Canada

Sessional Instructor — Apr 2025 – Sep 2025
Odette School of Business — Contract, Part-time
University of Windsor, Canada

Professor — Jan 2023 – Jun 2026
Faculty of Applied Sciences & Technology — Contract, Partial Load
Humber Polytechnic, Toronto, Canada

Professor — Jan 2023 – Jun 2025
School of Software Design & Data Science — Contract, Part-time
Seneca Polytechnic, Toronto, Canada

Graduate Teaching Assistant — Jan 2018 – Apr 2022
Toronto Metropolitan University, Canada — Contract, Part-time

PUBLICATIONS, PATENTS, AND PRESENTATIONS

Working papers/pre-prints

- **Muhammad Rehman Zafar**, Ali El-Sharif, and Naimul Khan. "FMMO: Detecting the Divergence Between Local Attribution and Global Drift." preprint arXiv:2609.06173 (2026) **[Under Review at ACM FAccT 2027]**
- **Muhammad Rehman Zafar**, Ashika Niraula, Hasti Havari Nasab, Maninder Kaur, Sayyada Aisha Mehvish, Naimul Mefraz Khan. "IDIO: A Hybrid, Source-Grounded AI Platform for Migration Discourse Research" **[Under Review at IAAI 2027]**

Peer-reviewed Conferences

- **Muhammad Rehman Zafar**, and Naimul Khan. "Attentional Feature Fusion for Few-Shot Learning." 2024 International Joint Conference on Neural Networks (IJCNN). IEEE, 2024.
- **Muhammad Rehman Zafar** and Munam Ali Shah. “Fingerprint authentication and security risks in smart devices.” 22nd International Conference on Automation and Computing (ICAC), 2016, pp. 548-553. IEEE, 2016.

Journal Articles

- Zeeshan Ahmad, Syeda Rabbani, **Muhammad Rehman Zafar**, Syem Ishaque, Sridhar Krishnan, Naimul Khan. "Multi-level Stress Assessment from ECG in a Virtual Reality Environment using Multimodal Fusion," in IEEE Sensors Journal, 2023.
- **Muhammad Rehman Zafar** and Naimul Mefraz Khan. "Deterministic Local Interpretable Model-Agnostic Explanations for Stable Explainability". Machine Learning and Knowledge Extraction. 2021, 3, 525-541.
- **Muhammad Rehman Zafar** and Muhammad Asfand-e-Yar, “Scheduling on Heterogeneous Multi-core Processors Using Stable Matching Algorithm” International Journal of Advanced Computer Science and Applications (IJACSA), 7(6), 2016 .

Peer-reviewed Workshops

- **Muhammad Rehman Zafar**, Hina Tariq, Mahwish Shahid, and Fareeha Anwar. 2026. Beyond Benchmark Accuracy: Auditing LLMs Reliability under Linguistic Variation. In Proceedings of the REACH-AI 2026 Workshop at CIKM 2026.
- **Muhammad Rehman Zafar** and Naimul Mefraz Khan. 2019. "DLIME: A Deterministic Local Interpretable Model-Agnostic Explanations Approach for Computer-Aided Diagnosis Systems". In Proceedings of Anchorage’19: ACM SIGKDD Workshop on Explainable AI/ML (XAI) for Accountability, Fairness, and Transparency (Anchorage’19).
- **Muhammad Rehman Zafar** and Arif Ur Rahman “Urdu Text Ambiguities and Their Impact on Named Entity Recognition, Word and Sentence Segmentation.” 5th Student Conference on Engineering Sciences and Technology (SCONEST), IEEE, 2016.

Patents

- Biggs, Edward W., L. O. W. E. Brianna, Justin Robert Caguiat, Naimul Mefraz Khan, Nabila Miriam Abraham, **Muhammad Rehman Zafar**, Syeda Suha Shee Rabbani, Zeeshan Ahmad, Mihai Constantin Albu, and Jacky Zhang. "Stress management in clinical settings." U.S. Patent Application 16/663,223 filed April 29, 2021.

TEACHING

I have taught the following courses at various Canadian post-secondary institutions:

Toronto Metropolitan University

- ITM301 – IT Infrastructure
- COE318 – Software Systems
- COE70A – Engineering Capstone

University of Windsor

- BSMM8730 Data Acquisition and Management

University of Niagara Falls

- DAMO640 – Machine Learning
- DAMO630 – Advanced Data Analytics
- CPSC600 – Advanced Data Visualization

Humber Polytechnic

- ITE5410 Deep Learning
- ITE5324 Big Data 1
- ITE5424 Big Data 2
- ITE5432 J2EE Business Components
- ITC5104 Introduction to Database and SQL

- AIGC5003 Machine Learning in Cloud Computing

Seneca Polytechnic
- DBD800 Accessing Big Data
- BAN110 Data Preparation and Handling

Teaching Assistant - Toronto Metropolitan University
- DS8003 Management of Big Data and Big Data Tools
- CIND830 Python Programming for Data Science
- CIND123 Data Analytics: Basic Methods
- CIND110 Data Organization for Data Analysts
- COE318 Software Systems
- COE628 Operating Systems

AWARDS, HONOURS, AND RECOGNITIONS

PhD, Toronto Metropolitan University

- Toronto Met Graduate Fellowship
- Toronto Met Graduate Development Award
- Toronto Met International Student Scholarship
- Toronto Met Graduate Travel Award

Master's, Bahria University, Pakistan

- Gold Medal, awarded for outstanding academic achievement
- Magna Cum Laude, awarded for outstanding academic achievement
- Open Merit Scholarship, awarded in recognition of outstanding academic performance
- Rector's Honour List, 2015–2017

ACADEMIC AND DEPARTMENTAL SERVICES

- ITM Curriculum Committee Sep 26 - Present
- Student Success and Retention Committee Sep 26 - Present
- ITM representative at Ontario Universities Fair Sep 26

PROFESSIONAL SERVICES

Conference & Workshop Service

- Program Committee Member, AAAI/ACM Conference on AI, Ethics, and Society (AIES), 2026
- Reviewer, Interpretability for Discovery Workshop, NeurIPS, 2026
- Reviewer, REACH-AI Workshop, CIKM, 2026
- Program Committee Member, Trustworthy Agentic Systems Symposium, AAAI, 2026
- Reviewer, International Joint Conference on Neural Networks (IJCNN), IEEE, 2025–2026

Journal Reviewing

- Reviewer, Machine Learning, Springer
- Reviewer, Expert Systems with Applications, Elsevier
- Reviewer, Big Data Mining and Analytics, IEEE
- Reviewer, Journal of Immigrant & Refugee Studies, Taylor & Francis
- Reviewer, PLOS ONE, PLOS
- Reviewer, Heliyon, Elsevier

Book Reviewing

- Reviewer, Interpretable Machine Learning with Python, Packt
- Reviewer, Human-in-the-Loop Machine Learning, Manning

Community Service

- Explainable AI Stream Owner & Discussion Panelist, Workshop Organizer, Aggregate Intellect, Sep 2020 to Dec 2022

INDUSTRY EXPERIENCE

Software Development Consultant Jul 2020 – Jun 2025
Self-employed, Toronto, Canada

- Lead and coordinate with cross-functional teams to ensure seamless delivery and deployment of software applications and data-driven solutions.

Senior Software Developer
ARB Labs, Toronto, Canada
Permanent, Part-time Aug 2017 – Mar 2020

- Spearheaded the design and deployment of an optical bet recognition system, automating data capture for real-time player and table metrics.

Assistant Manager Data Analytics and Mobile Applications
Interactive Group of Companies, Islamabad, Pakistan Sep 2016 – Jul 2017
Permanent, Full-time

- Led large-scale application development, driving revenue growth and improving user experience.
- Managed a research and development team, achieving key project milestones and delivering user-centric mobile solutions.

Lead Software Engineer
Interactive Group of Companies, Islamabad, Pakistan Dec 2014 – Aug 2016
Permanent, Full-time

- Spearheaded the development of Pakistan's first on-board entertainment system for national transport company.

Senior Software Engineer
Medical Transcription and Billing Company, Rawalpindi, Pakistan Apr 2013 – Jun 2014
Permanent, Full-time

- Led a team of backend developers, providing technical guidance, conducting code reviews, and enhancing team efficiency.

Software Engineer
Medical Transcription and Billing Company, Rawalpindi, Pakistan May 2012 – Mar 2013
Permanent, Full-time

- Developed and maintained backend systems, including web services and APIs, ensuring functionality and scalability.

PROFESSIONAL AFFILIATIONS AND MEMBERSHIPS

- Member of Institute of Electrical and Electronics Engineers (IEEE)
- Member of Association for Computing Machinery (ACM)
- Member of Association for the Advancement of Artificial Intelligence (AAAI)
- Member of Canadian Artificial Intelligence Association (CAIAC)