Redwan Ahmed Rizvee

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Research Interest

My current research focuses on the challenge of making datasets interpretable and explainable in real-time. I develop **perception-aware sampling algorithms** that bridge statistical learning theory with computational aspects to preserve visual fidelity in big data visualization. Broadly, I am interested in Data Mining, Data Analytics, and Database Theory, specifically designing scalable systems. I am a part of DREAM lab and fortunate enough to be supervised by Dr. Alexandra Meliou.

Education

- **University of Massachusetts Amherst** — Massachusetts, USA
  MS/PhD in Computer Science — *Fall 2025 - Current*

- **Department of Computer Science and Engineering, University of Dhaka** — Dhaka, Bangladesh
  Master of Science in Computer Science and Engineering — *Jan 2019 - Sep 2021*
  CGPA: 4.00/4.00 (Ranked 1st in the class)

- **Department of Computer Science and Engineering, University of Dhaka** — Dhaka, Bangladesh
  Bachelor of Science in Computer Science and Engineering — *Jan 2015 - Dec 2018*
  CGPA: 3.85/4.00 (Ranked 1st in the class)(Course List)

- **Notre Dame College** — Dhaka, Bangladesh
  Higher Secondary School Certificate — *2014*
  GPA: 5.00/5.00

- **Ideal School and College** — Dhaka, Bangladesh
  Secondary School Certificate — *2012*
  GPA: 5.00/5.00

Research Experience

- **University of Massachusetts Amherst** — Amherst, MA, USA
  Graduate Research Assistant — *Fall 2025 – Present*
  - **Perception-Aware Sampling**: Developing **Perception-Aware Sampling** algorithms for optimizing visual fidelity in scatter plots to preserve both outliers and core dense regions to have more coverage and better representation of the complete data space, addressing computational efficiencies.

- **TigerIT Bangladesh Limited** — Dhaka, Bangladesh
  Research Scientist — *July 19, 2020 - Feb 28, 2022*
  - **Responsibilities**: My projects mainly included,
    * Statistical sensor data analysis.
    * Rule-based algorithms and encoder-decoder with attention-based deep learning algorithms focusing on audio and natural language processing.

- **Cognitive Agents and Interaction Lab (*CAIL*)** — Dhaka, Bangladesh
  CO-Investigator — *2023 - PRESENT*
  - **Responsibilities**: Supervised and contributed to diverse projects employing Deep Learning, Reinforcement Learning, and Agent-based Decision-making techniques. Played an active role in designing and implementing **COLAS**, an automated system for evaluating source code.

- **Data Mining Research Lab** — Dhaka, Bangladesh
  CO-Investigator | Ex - Research Assistant — *2018 - PRESENT*
  - **Responsibilities**: Designed and implemented novel pattern mining algorithms, representational techniques, and optimization strategies to address scalability, reliability, and resource efficiency in sequential and time-series pattern mining. Developed methods and metrics for robust correlation analysis and effective cluster generation.

- **Data and Design Lab** — Dhaka, Bangladesh
  Research Assistant — *2019 - 2021*
  - **Responsibilities**: Worked on three main projects focused on policy-making and statistical analysis:
    * Bangladesh Quality of Life Indicators (**BDQOL**): Developed Visualization tool, data collection, planning, and analysis.
    * Nightlights for Economic Condition: Data processing, analysis, and manuscript preparation.
    * Newspaper Data Analysis to Understand Coronavirus Awareness: Data collection, analysis and manuscript preparation.

- **Bangladesh Rural Advancement Committee (BRAC)** — Dhaka, Bangladesh
  Junior Consultant — *Apr 2019 - Sep 2019*
  - **Responsibilities**: In this project, my teammates and I designed a system to uniquely identify beneficiaries accessing various BRAC services, using only basic information despite challenges like repetition, spelling errors, and variations.

Teaching Experience

- **University of Dhaka** — Dhaka, Bangladesh
  Lecturer, Full-Time — *30 March, 2023 - Current*
  - **Courses Conducted**: Software Design Pattern, Micro-controller, Software Engineering.
- **East West University** — Dhaka, Bangladesh
  Lecturer, Full-Time — *05 Feb, 2022 - 30 Mar, 2023*
  - **Courses Conducted**: Structured Programming, Algorithms, Artificial Intelligence.
- **University of Barishal** — Dhaka, Bangladesh
  Adjunct Faculty — *Aug 2024 - Current*
  - **Courses Conducted**: Integral Calculus, Ordinary and Partial Differential Equations and Series Solutions.

Selected Projects

- **COLAS - Coding Lab Assistant** | *Python, React JS*
  COLAS is a scalable, automated, and robust source code evaluation, Strict Monitoring, and plagiarism detection system designed to support live programming lab assessments. It automates the collection, evaluation, and analysis of student code submissions – ensuring both fairness and efficiency during competitive programming contests and academic lab sessions with a diverse set of utilities and personalized recommendations.
- **MSCLM-A** | *Python*
  A Memory flexible language independent Sentence Completion module using Language Model based on Arpa file.
- **Bangla Sentiment Analysis** | *Python*
  An undergraduate project for the Math for CS course to identify sentiments from Bangla sentences.
- **Bangla Pos Tagger** | *Python*
  An undergraduate NLP Project to tag parts of speech in Bangla sentences.
- **Bangladesh Quality of Life Indicator (BDQOL)** | *HTML, Vanilla JS*
  A visualization tool to demonstrate the socio-economic condition of Bangladesh based on SGD indicators.

Key Skills

- **Programming**: C++, C, Python, Java, SQL, Unix scripting
- **Machine Learning and Data analysis**: PyTorch, Keras, Tensorflow, Pandas, Numpy, SciPy, Scikit-learn, Gensim.
- **Python Framework**: Django, React Native, Flask
- **Software and Code Maintenance**: GIT, Docker
- **Web Development Language**: HTML5, CSS, Javascript, Bootstrap, PHP, React, Node.js, Express.
- **Operating Systems**: Windows, Ubuntu.
- **Database Management**: MySQL, Oracle SQL, PostgreSQL, Firebase.
- **Problem Solving**: Please find my StopStalk profile here.

Honors and Awards

- **University of Dhaka Research Excellence Recognition, 2025**, In recognition of exemplary contribution to scholarly excellence through high-quality research publications.
- **Dean's Award, 2019**, for outstanding achievement from the Faculty of Engineering and Technology, University of Dhaka, Session 2014-15
- **Azfar Alam Memorial Gold Medal, 2019**, for achieving excellent results from the Department of Computer Science and Engineering, University of Dhaka, Session 2014-15.
- **Professor Dr. M. Lutfar Rahman Award, 2022**, from the Department of Computer Science and Engineering, University of Dhaka for acquiring the first position in the batch in B.Sc
- **Fellowship Scholarship**, from ICT Division, People's Republic of Bangladesh, to conduct high-quality research that could keep an impact on the socio-economic life of the people of Bangladesh.

PUBLICATIONS

1. **Rizvee, Redwan Ahmed**, et. el, "Revival of Muslin by Phuti Karpas plant identification with convolution neural network", Array, 27, 100428. [DOI]

2. **Rizvee, Redwan Ahmed**, Chowdhury Farhan Ahmed, Carson. K. Leung, "A Tree-Based Framework to Mine Top-K Closed Sequential Patterns", Applied Intelligence 55, 221 (2025). [DOI]

3. **Rizvee, Redwan Ahmed**, Raheeb Hassan and Md. Mosaddek Khan, "Reinforcement Learning-Based Formulations With Hamiltonian-Inspired Loss Functions for Combinatorial Optimization Over Graphs," in IEEE Access, vol. 12, pp. 171055-171065, 2024. [DOI]

4. **Rizvee, Redwan Ahmed**, Chowdhury Farhan Ahmed, Md Fahim Arefin, and Carson K. Leung. "A new tree-based approach to mine sequential patterns." Expert Systems with Applications (2023): 122754.

5. **Rizvee, Redwan Ahmed,** *et al.* "Mining Weighted Patterns from Time Series Databases Based on Sliding Window." Dhaka University Journal of Applied Science and Engineering 8.1 (2023): 13-25.

6. **Rizvee, Redwan Ahmed**, Mohammad Fahim Arefin, and Chowdhury Farhan Ahmed. "Tree-miner: mining sequential patterns from sp-tree." Pacific-Asia conference on knowledge discovery and data mining. Springer, Cham, 2020.

7. Bappy, Faisal Haque, Saklain Zaman, Tariqul Islam, **Redwan Ahmed Rizvee**, Joon S. Park, and Kamrul Hasan. "Towards Immutability: A Secure and Efficient Auditing Framework for Cloud Supporting Data Integrity and File Version Control." In GLOBECOM 2023-2023 IEEE Global Communications Conference, pp. 6801-6806. IEEE, 2023.

8. **Rizvee, Redwan Ahmed**, et al. "LeafNet: A proficient convolutional neural network for detecting seven prominent mango leaf diseases." Journal of Agriculture and Food Research (2023): 100787.

9. Arefin, Md Fahim, Chowdhury Farhan Ahmed, **Redwan Ahmed Rizvee**, Carson K. Leung, and Longbing Cao. "Mining Contextual Item Similarity without Concept Hierarchy." In 2022 16th International Conference on Ubiquitous Information Management and Communication (IMCOM), pp. 1-8. IEEE, 2022.

10. **Rizvee, Redwan Ahmed**, Md Fahim Arefin, and Marzan Binte Abid. "A Robust Objective Focused Algorithm to Detect Source Code Plagiarism." 2022 IEEE 13th Annual Ubiquitous Computing, Electronics & Mobile Communication Conference (UEMCON). IEEE, 2022.

11. **Rizvee, Redwan Ahmed**, et al. "Sliding window based weighted periodic pattern mining over time series data." In 19th Industrial Conference on Data Mining, 2019.

12. **Rizvee, Redwan Ahmed**, et al. "An Automated System to Calculate Marks from Answer Scripts." 2022 IEEE 13th Annual Information Technology, Electronics and Mobile Communication Conference (IEMCON). IEEE, 2022.

13. **Rizvee, Redwan Ahmed**, and Moinul Zaber. "How Newspapers Portrayed COVID-19: A Study Based on United Kingdom and Bangladesh." International Conference on Computer Science Protecting Human Society Against Epidemics. Springer, Cham, 2021.

14. **Rizvee, Redwan Ahmed**, et al. "A robust three-stage hybrid framework for english to bangla transliteration." Int. J. Nat. Lang. Comput 11.1 (2022).

15. Wahed, Muntasir, **Redwan Ahmed Rizvee**, Riddho Ridwanul Haque, Amin Masud Ali, Moinul Zaber, and Amin Ahsan Ali. "What Can Nighttime Lights Tell Us about Bangladesh?." In 2020 IEEE Region 10 Symposium (TENSYMP), pp. 1612-1615. IEEE, 2020.

16. Dewan, Umama, Chowdhury Farhan Ahmed, Carson K. Leung, **Redwan Ahmed Rizvee**, Deyu Deng, and Joglas Souza. "An efficient approach for mining weighted frequent patterns with dynamic weights." In 19th Industrial Conference on Data Mining, 2019.

REFERENCES

- **Dr. Alexandra Meliou**   Email: ameli@cs.umass.edu
  Professor, Manning College of Information and Computer Sciences
- **Dr. Chowdhury Farhan Ahmed**   Email: farhan@du.ac.bd
  Professor, Department of Computer Science and Engineering, University of Dhaka
- **Dr. Md. Mosaddek Khan**   Email: mosaddek@du.ac.bd
  Associate Professor, Department of Computer Science and Engineering, University of Dhaka