

REZAUR RASHID, PhD

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Education

- **Doctor of Philosophy in Computing and Information Systems** August 2019 – August 2024
The University of North Carolina at Charlotte, Charlotte, NC
Concentration: Computer Science | Current GPA: 3.90/4.00
- **Bachelor of Science in Computer Science and Engineering** May 2013 – April 2017
BRAC University, Dhaka, Bangladesh | GPA: 3.67 (With High Distinction)

Research Interests

Machine Learning, Causality, and Graph Neural Networks with applications in data science, including health care, social dynamics, and business analytics. I aim to develop robust, scalable models for real-world decision-making, with an emphasis on building AI-driven frameworks that connect causal models into interdisciplinary projects.

Current Research

- **Enriching Cancer Care Access: AI-Driven Tool for Radiation Therapy Optimization (X-CART)**
The project aims to develop an AI-driven tool, X-CART (Explainable AI for Cancer Radiation Treatment), to predict and prevent radiation therapy (RT) interruptions in cancer patients, particularly those from underserved populations. By integrating social determinants of health (SDoH) data with clinical records, the project seeks to provide personalized interventions that mitigate treatment disruptions and improve healthcare equity.

Experiences

- **Postdoctoral Fellow**, Center for Biomedical Informatics (CBMI) September 2024 – Present
Department of Pediatrics, College of Medicine
The University of Tennessee Health Science Center
 - Conduct research on cancer data analytics, focusing on understanding and mitigating radiation therapy (RT) interruptions in underserved populations using causal modeling and explainable AI.
 - Develop and implement AI-driven tools to analyze the impact of social determinants of health on cancer treatment outcomes, contributing to equitable healthcare delivery.
 - Collaborate with interdisciplinary teams of researchers and clinicians to advance innovative approaches in cancer.
- **Graduate Research Assistant**, UNC Charlotte August 2019 – August 2024
 - Worked on projects funded by the Army Research Office (ARO), Lowe's Innovation Fund and the USDA National Institute of Food and Agriculture.
 - Responsibilities included developing AI models across multiple projects and publishing research papers utilizing advanced causal and machine learning techniques.
- **Data Science Intern**, Lowe's Companies, Inc. July 2022 – August 2022
 - Applied causal modeling framework and developed models for descriptive, prescriptive, and predictive analytics in supply chain metrics at Lowe's, enhancing data-driven decision-making.
 - Implemented Automated Feature Synthesis (Python Library), an automated alternative to the traditional SQL queries. [[git-repo](#)]
 - Developed Causal Feature Selection (Python Library), identifying the main causal factors of the Regional Distribution Center's performance measures. [[git-repo](#)]
- **Graduate Teaching Assistant**, UNC Charlotte May 2020 – June 2020
 - Courses Taught: Network-Based Application Development.
- **Lecturer**, Computer Science & Engineering, Bangladesh University, Bangladesh May 2017 – June 2019
 - Courses Taught: Algorithms and Data Structures, Pattern Recognition, Artificial Intelligence.
 - Fostered critical thinking and problem-solving skills among students.

Conference Publications

- Rashid, R., Melton, J., Ghorbani, O., Krishnan, S., Reid, S. & Terejanu, G. (2024). Quantifying Influencer Effects on Affective Polarization. In *23rd IEEE International Conference on Machine Learning and Applications (ICMLA) (Accepted)*. In press. arXiv preprint arXiv:2405.15893.
- Rashid, R., & Terejanu, G. (2024). Graph Neural Networks for Probabilistic Causal Discovery. In *the 9th Causal Inference Workshop at UAI 2024*.
- Rashid, R., Chowdhury, J. & Terejanu, G. (2023). Causal Feature Selection: Methods and a Novel Causal Metric Evaluation Framework. In *2023 IEEE 10th International Conference on Data Science and Advanced Analytics (DSAA)* (pp. 1-9). IEEE.
- Chowdhury, J, Rashid, R. & Terejanu, G. (2023). Evaluation of Induced Expert Knowledge in Causal Structure Learning by NOTEARS. In *Proceedings of the 12th International Conference on Pattern Recognition Applications and Methods (ICPRAM)* (pp. 136-146). SciTePress.
- Rashid, R., Chowdhury, J. & Terejanu, G. (2022). From Causal Pairs to Causal Graphs. In *21st IEEE International Conference on Machine Learning and Applications (ICMLA)* (pp. 802-807). IEEE.
- Terejanu, G., Chowdhury, J., Rashid, R., & Chowdhury, A. (2020). Explainable Deep Modeling of Tabular Data using TableGraphNet. arXiv preprint arXiv:2002.05205.
- Rashid, M. R., Shuvra, N. K. D., Roy, R. S., & Sarker, S. (2018). A Theoretical Approach of Fall Control System for Disabled People Using Double Inverted Pendulum. In *2018 4th International Conference on Electrical Engineering and Information & Communication Technology (iCEEICT)* (pp. 49-53). IEEE.
- Rashid, M. R., Uzzaman, N., Hossain, S., & Shuvra, N. K. D. (2017). Development of a self-navigating algorithm for library book finder robot. In *2017 3rd International Conference on Electrical Information and Communication Technology (EICT)* (pp. 1-6). IEEE.
- Uzzaman, N., Hossain, S., Rashid, R., & Hossain, A. (2016). A comparative analysis between light dependent and ultrasonic method of gesture recognition. In *2016 3rd International Conference on Electrical Engineering and Information Communication Technology (ICEEICT)* (pp. 1-5). IEEE.

Past Research Projects:

- **Causal Modeling of Affective Polarization in Social-Media (2024, ICMLA)**
Develop an interactive causal modeling framework to understand affective polarization by bridging the gap between data-driven methods for discovering causal relations and expert domain knowledge to mitigate the impact of data limitations.
- **Graph Neural Networks (GNN) based Probabilistic Framework for Causal Discovery (2024, UAI)**
Integrating GNNs to improve causal structure learning and feature selection, addressing scalability and high-dimensionality challenges in causal inference.
- **Modeling the "Why" in Business Operations (Lowe's)**
Businesses collect vast amounts of data, which they leverage with advanced modeling techniques to develop actions to enhance their operations. The goal of this research is to create an AI engine that provides managers with actionable recommendations to produce a desired effect on key performance indicators, e.g. supply chain metrics.
- **Causal Feature Selection: Methods and Evaluation Framework (2023, DSAA)**
Introduced the Causal Feature Selection (CFS) algorithm to identify key variables influencing the outcome variable, incorporating a novel criterion for evaluating causality. This research advances causal inference methodologies by enhancing model interpretability and accuracy.
- **From Causal Pairs to Causal Graphs (2022, ICMLA)**
Developed a probabilistic approach to causal discovery, leveraging the cause-effect pair features. It addresses the scalability issues present in traditional methods and introduces a more robust framework for understanding the intricate mechanisms underlying causal systems from observational data.

Graduate Academic Projects

- **Sentiment Analysis of Social Media Responses (Twitter data) Using Spark and Python** [\[git-repo\]](#) 2022
 - Implemented a multi-class SVM classifier to analyze Twitter sentiments across three categories, enhancing model accuracy by leveraging Spark for high-performance, distributed data processing.
 - Compared SVM performance with Logistic Regression, achieving a superior testing accuracy of 72.83%, and defined feature importance techniques to identify key words driving sentiment predictions.
- **A Statistical Analysis of Different Corona Virus (COVID-19) Aspects in the U.S. and Forecasting the U.S. Mortality-rate Time-series Using R** [\[git-repo\]](#) 2022
 - Conducted a comprehensive statistical analysis and designed predictive models for COVID-19 mortality rates in the U.S.
 - Improved understanding of pandemic trends and supported public health decision-making.
- **Review of Deep Neural Network (DNN) and Convolutional Neural Network (CNN): An Information Theoretic Analysis** 2020
 - This study analyzes DNNs and CNNs from an information-theoretic perspective, covering methods, applications, and open research problems.
 - Provides insights into the trustworthiness of Deep Neural Networks (DNNs) and sheds light on their limitations and potential for improvement.
- **Machine Learning in Pneumonia Detection from X-ray Images** [\[git-repo\]](#) 2019
 - Developed and validated a convolutional neural network model for detecting pneumonia from chest X-rays, employing advanced image preprocessing techniques.
 - Enhanced diagnostic accuracy and provided a scalable tool for medical imaging analysis.

Bachelor Final Year Thesis

May 2016 – April 2017

- **Thesis Title:** Human Fall Control System for Disabled People Using Double Inverted Pendulum
- **Thesis Survey:** Study on the pattern of walking and stance principle of Polio and Parkinson's patients, School of Engineering and Computer Science, BRAC University, Bangladesh.

Awards and Fellowships

- **Graduate School Summer Fellowship (GSSF), UNC Charlotte** 2023
- **Graduate Travel Funding** for academic and professional conferences GPSG, UNC Charlotte 2022
- **Vice-chancellor's list of honor** for academic excellence, BRAC University, Bangladesh 2013, 2016
- **Dean's list of honor** for academic excellence, BRAC University, Bangladesh 2015, 2016

Scientific Community Activities

- **Manuscript Review:**
 - International Conference on Advances in Social Networks Analysis and Mining (ASONAM) 2024
 - IEEE International Joint Conference on Neural Networks (IJCNN) 2023, 2024
- **Affiliations:**
 - Member – IEEE Computer Society 2024 – Present
 - Member – Association for Computing Machinery 2024 – Present