




Tamal Joyti Roy

2nd Year PhD Student,

Measurement, Quantitative Methods & Learning Sciences (MQM-LS)

University of Houston

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Education

- 2023-Present Ph.D. in Measurement, Quantitative Methods, and Learning Science,
University of Houston, USA
Focus: Quantitative Methods
Research areas: Digital health education, Health Informatics, Motivation, Grits, Engagement, Academic procrastination, Self-efficacy
- 2016-2020 Bachelor of Science in Computer Science and Engineering
North Western University, Bangladesh
Major: Computer Science and Engineering
Research focus: Machine learning, Data science, Data mining

Professional Experience

- June 2024- Present ***Research Assistant***
University of Houston, College of Education, Houston, TX
Grant-funded (\$100k) project by the Hispanic Federation.
1. Led comprehensive data management operations across multiple health intervention programs, implementing standardized protocols to ensure data integrity and accuracy
 2. Directed data collection and analysis strategies for the Diabetes Prevention Program and Nutrition Ambassador Program, supporting evidence-based program evaluation
 3. Mentored and supervised a team of graduate and undergraduate interns, providing guidance on research methodologies and professional development
 4. Contributed to scholarly publications through manuscript preparation and statistical analysis, advancing program research objectives
- Status: Part-time*
- June 2024- Aug 2024 ***Instructional Assistant***
University of Houston, C.T. Bauer College of Business, Houston, TX
1. Spearheaded data analysis initiatives for a funded research project, delivering key insights that supported project objectives and research outcomes
 2. Collaborated in manuscript preparation for publication, synthesizing complex research findings into clear, publication-ready content
 3. Performed comprehensive statistical analyses to validate research hypotheses and strengthen manuscript conclusions
- Status: Part-time*

- June 2024- Aug 2024 *Teaching Assistant*
University of Houston, College of Education, Houston, TX
1. Independently managed two asynchronous course sections of 50 students each, providing comprehensive academic support and maintaining high student engagement
 2. Facilitated student learning through regular office hours, proactive communication, and individualized support to ensure understanding of complex psychological concepts
 3. Administered course content and learning materials through Canvas LMS, ensuring timely updates and seamless access to educational resources
- Status: Part-time*
- Aug 2023-May 2024 *Research Assistant*
University of Houston, College of Education, Houston, TX
1. Led comprehensive data analysis projects utilizing advanced statistical methods to evaluate student success metrics, delivering actionable insights to improve educational outcomes
 2. Developed and automated data preprocessing workflows, significantly reducing processing time and ensuring data quality across multiple research initiatives
 3. Created compelling data visualizations and detailed analytical reports using Tableau and Power BI, effectively communicating complex findings to diverse stakeholders
 4. Earned certifications in Tableau and Power BI, implementing newly acquired skills to enhance data presentation and analysis capabilities
- Status: Part-time*
- Nov 2021-Jun 2023 *Data Scientist*
United We Care, India
1. Led enterprise-wide implementation of generative AI solutions and data science frameworks, driving technological innovation and operational efficiency
 2. Orchestrated SEO analytics strategy and optimization initiatives, leveraging data-driven insights to enhance digital presence and performance metrics
 3. Engineered advanced predictive models using PyTorch and scikit-learn, delivering actionable insights for business decision-making
 4. Designed and executed sophisticated statistical analyses, translating complex data into clear, actionable reports for stakeholders
- Status: Full-time*

Peer-Reviewed Publications

Journal Article

- 2022 Hossain, M. M., Saha, N., Rodela, T. T., Tasnim, S., Nuzhath, **T., Roy, T. J.,** Burdine, J. N., Ahmed, H. U., McKyer, E. L. J., Basu, B. K., & Ma, P. (2022). Global research on syndemics: a meta-knowledge analysis (2001-2020). *F1000Research*, 11(253), 253.
<https://doi.org/10.12688/f1000research.74190.2>

Conference Proceedings & Presentation

- 2024 Huynh, A. L., **Roy, T. J.,** Jackson, K. N., Lee, A., & Mahbub Hossain, M. (2024). *Effectiveness of AI-based chatbots in healthcare: An umbrella review*. https://aisel.aisnet.org/treos_icis2024/130
- 2023 **Roy, T. J.,** & Ashiq Mahmood, M. (2023). Global warming and Bangladesh: A machine learning approach to analyze the warming rate utilizing neural network. In *Lecture Notes in Electrical Engineering* (pp. 19–30). Springer Nature Singapore.
- 2022 Ashiq Mahmood, M., **Roy, T.J.,** Ashiqul Amin, M., Roy, D., Mohanta, A., Fayezy Dipty, F., & Mitra, S. (2023). A hybrid approach to find COVID-19 related lung infection utilizing 2-bit image processing. In *Lecture Notes in Networks and Systems* (pp. 119–127). Springer Nature Singapore.
- 2022 **Roy, T. J.,** Mahmood, M. A., & Mohanta, A. (2022). An efficient approach to validate COVID-19 related vaccine myths utilizing LDA algorithm. *Proceedings of the 2nd International Conference on Computing Advancements*, 53–58.
- 2022 **Roy, T. J.,** Mahmood, M. A., Mohanta, A., Roy, D., Jyoti, J. T., & Ghosh, P. K. (2022). A machine learning approach to analyze the performance of Bangladesh cricket in T20. *2022 International Conference on Innovations in Science, Engineering and Technology (ICISSET)*, 129–134.
- 2022 Roy, D., **Roy, T. J.,** Mahmud, I., & Alvi, N. (2022). An efficient approach to predict fear of human's mind during COVID-19 outbreaks utilizing data mining technique. In *Advances in Intelligent Systems and Computing* (pp. 41–51). Springer Singapore.
- 2021 **Roy, T. J.,** Mahmood, M. A., & Roy, D. (2021). A machine learning model to predict earthquake utilizing neural network. *2021 International Conference on Computer, Communication, Chemical, Materials and Electronic Engineering (IC4ME2)*, 1–4.

- 2021 **Roy, T. J.**, Mahmood, M. A., & Roy, D. (2021). An efficient approach to identify the key factors of failure of Bangladesh cricket team in test cricket utilizing hypothesis testing and clustering method. *2021 5th International Conference on Electrical Information and Communication Technology (EICT)*, 1–6.
- 2021 **Roy, T. J.**, Mahmood, M. A., Mohanta, A., & Roy, D. (2021). An analytical approach to predict the COVID-19 death rate in Bangladesh utilizing multiple regression and SEIR model. *2021 IEEE International Conference on Robotics, Automation, Artificial-Intelligence and Internet-of-Things (RAAICON)*, 42–45.
- 2021 Roy, D., Mahmood, M. A., **Roy, T. J.**, & Mohanta, A. (2021). A two-step clustering approach to measure soil quality of sundarban based on organic carbon and bulk density. *2021 IEEE International Conference on Robotics, Automation, Artificial-Intelligence and Internet-of-Things (RAAICON)*, 85–88.

Book Chapters

- 2024 Shelton, L., Nguyen, K., Joseph, T., **Roy, T. J.**, Roy, P., Alarcón, J., & Olvera, N. (in press). How is our community healthy? Program design and lessons learned while training college students to facilitate photovoice projects with children. In *The Palgrave Handbook on Participatory Action Research with Children*. Palgrave Macmillan.
- 2023 Roy, D., Mahmood, M. A., & **Roy, T. J.** (2023). An efficient approach to assess the soil quality of Sundarbans utilizing hierarchical clustering. In *Applied Intelligence for Industry 4.0* (pp. 79–89). Chapman and Hall/CRC.

Manuscript Under Review

- 2025 Factors Influencing Academic Success of First-Generation College Students in the United States: A Systematic Review
- 2025 Preventing health information disorders (HIDs) in college students: Perspectives on health information hygiene in higher education
- 2025 Understanding Medical Weight Problem Diagnosis in Hispanic Women and Men: The Role of Healthcare Utilization, Body Image, and Perceived Health Status

Manuscript Under Preparation

- 2025 Emotional Eating in Hispanic Adolescents: Role of Anxiety and Sleep Quality
- 2025 The Role of Self-Efficacy and Regulation Difficulties in Predicting Academic Procrastination
- 2025 The Role of Anxiety, Body Discrepancy, and Sleep on Body Mass Index Among Latino Youth

2024	The impact of teacher and student beliefs on math and science engagement. Manuscript in preparation.
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Academic Services

Peer Reviewer

2024	PLOS ONE
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Honors & Awards

2024-2025	Graduate Tuition Fellowships (\$8162), University of Houston
2024-2025	Out-of-State Tuition Waiver (\$9144), University of Houston
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2023-2024	Out-of-State Tuition Waiver (\$9144), University of Houston

Projects

University of Houston

June 2024	Systematic Review: First-Generation College Student Success in the United States <ol style="list-style-type: none"> 1. Led a comprehensive systematic review investigating success factors among first-generation college students in the United States, screening and analyzing 32+ peer-reviewed articles 2. Developed and implemented systematic search protocols across multiple academic databases to identify relevant literature in higher education and student success domains
June 2022	Image to Text Classification: OCR Model Implementation <ol style="list-style-type: none"> 1. Engineered an OCR (Optical Character Recognition) model leveraging TensorFlow's deep learning capabilities and OpenCV for robust text detection and extraction 2. Implemented an end-to-end text detection and conversion pipeline that transforms image-based text into digital format 3. Successfully designed and integrated a categorization system for processing and organizing extracted text content
April 2022	Time Series Analysis <ol style="list-style-type: none"> 1. Developed and implemented a SARIMAX (Seasonal ARIMA with Exogenous Variables)

	<ul style="list-style-type: none"> model for accurate trend prediction and future value forecasting 2. Performed comprehensive time series decomposition to achieve data stationarity through systematic removal of trend, seasonal, and cyclical components 3. Built an end-to-end forecasting pipeline using Python, integrating Scikit-learn for preprocessing and model evaluation
January 2022	<p>Emotion Classification from Open Source Data</p> <ul style="list-style-type: none"> 1. Designed and implemented an emotion detection system utilizing advanced machine learning techniques to analyze user sentiment across multiple data sources 2. Developed and optimized classification algorithms for accurate emotion categorization and pattern recognition 3. Built a comprehensive data processing pipeline for sentiment analysis and emotion classification
January 2022	<ul style="list-style-type: none"> 1. Engineered and implemented sentiment analysis models using advanced machine learning techniques to extract insights from large-scale public datasets 2. Conducted comprehensive data preprocessing, feature engineering, and model optimization for improved sentiment classification accuracy 3. Developed detailed analytical reports documenting methodology, findings, and key insights from the sentiment analysis
December 2019	<p>Data Mining for COVID-19 and Human Fear Correlation</p> <ul style="list-style-type: none"> 1. Led a comprehensive research study analyzing COVID-19 fear patterns across diverse demographic groups, managing data collection from 553 participants 2. Implemented and compared ten distinct machine learning algorithms, achieving optimal performance with LogitBoost (70.34% accuracy) for fear prediction 3. Developed professional research visualizations and documentation using Weka, Google Drawing, and Adobe Illustrator 4. Authored detailed technical reports and research presentations using LaTeX
Certifications	
2024	AI Productivity Hacks (LinkedIn)
2024	Intermediate Python for NonProgrammers (LinkedIn)

2024	Introduction to Prompt Engineering for Generative AI (LinkedIn)
2023-2026	Social-Behavioral-Educational Researchers (CITI Program)

Technical Skills

Programming Languages	Python, C, C++, Java, R
Machine Learning Library	Pytorch, scikit-learn, TensorFlow
Data Analysis	SPSS, Data mining, Excel, RapidMiner studio, Power BI
Visualization	Matplotlib, Excel
Tools	LaTeX, Git, Canvas