

ADIBA MAHBUB PROMA

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Research Interest

Large Language Models, Computational Social Science, Human-Computer Interaction, Network Analysis, Social Networks, Agent-based Modelling, LLM Evaluation, AI and Society

Education

University of Rochester

Doctor of Philosophy in Computer Science (Human-Computer Interaction)

Feb 2021 - Present

Rochester, NY, USA

University of Rochester

Master of Science in Computer Science

Feb 2021-Dec 2022

Rochester, NY, USA

BRAC University

Bachelor of Science in Computer Science and Engineering, Highest Distinction Award (GPA: 3.97)

Jan 2016 - Dec 2019

Dhaka, Bangladesh

Experience

Graduate Research Assistant, University of Rochester

Feb 2021-Present

Advisor: Dr. Ehsan Hoque (Rochester Human-Computer Interaction Lab)

Rochester, NY, USA

- **Designing Interpretable Personalized Reasoning Agents**
 - * Built end-to-end pipeline of LLM-based agents that can provide personalized persuasive responses to queries, and also provide reasoning about their response
- **Exploring LLM Interventions to Reduce Misinformation in Networks during US 2024 Elections [Preprint, Publication]**
 - * Built end-to-end pipeline of LLM-based personalized persuasive agents to reduce political misinformation
 - * Implemented ranking algorithms (collaborative filtering, K-Means Clustering), retrieval augmented generation (RAG) models and prompt-engineering for summarization to build LLM-based agent
 - * Conducted control-treatment studies (N = 1265) to evaluate the role of LLM interventions in reducing political misinformed beliefs within networks during US 2024 Elections
- **Understanding Belief Rigidity in Temporal Social Networks [Publication]**
 - * Designed and developed a social media-like platform for case-control studies on the impact of peers on belief rigidity
 - * Achieved 22% reduction in homophily using our designed recommendation algorithms
- **Redesigning Interface to Facilitate Eco-friendly Consumption in Online Platforms [Publication]**
 - * Conducted a case-control study with 98 participants to encourage purchasing of eco-friendly products
- **Automated knowledge graph for climate change [Publication]**
 - * Contributed to building a knowledge graph for environmental issues, extracting 411,860 facts from scientific literature

Applied Research Intern, Microsoft Research

May 2026-Aug 2026

Advisor: Dr. David Rothschild

NYC, NY, USA

- Exploring the role of conversational AI chatbots to extract core political narratives of individuals

Visiting Research Intern, University of Zurich

May 2025-Jul 2025

Advisor: Dr. Fabrizio Gilardi

Zurich, Switzerland

- Designed and implemented persona-specific LLM agents using Ollama for online chatroom experiments

Data Science Intern, Tech for Development Unit, BRAC SDP, [BRAC Bangladesh](#)

Feb 2020-Jul 2020

BRAC SDP is an initiative by BRAC NGO to boost informal sector job placements

Dhaka, Bangladesh

- Conducted statistical analysis and data visualization to analyze COVID-19's effect on income, aiding strategy decisions

Journal Publications

- A. Proma, N. Pate, R. A. Baten, S. Chen, J. Druckman, G. Ghoshal, E. Hoque, **Exploring the Role of Randomization on Belief Rigidity in Online Social Networks**, IEEE Transactions on Affective Computing, 2026 [Journal Impact factor: 9.8] [Publication]
- S. Keltz, R. A. Baten, A. Proma, E. Hoque, J. Bollen, and G. Ghoshal, **The Innovation Trade-off: how Following Superstars Shapes Academic Novelty**, Humanities and Social Sciences Communications, 2025 [Journal Impact factor: 3.7] [Publication]
- M. S. Islam, A. Proma, C. Wohn, K. Berger, S. Uong, V. Kumar, K. S. Korfmacher, E. Hoque, **SEER: Sustainable E-commerce with Environmental-impact Rating**, Cleaner Environmental Systems, 2023 [Journal Impact factor: 6.1] [Publication]

Conference Publications

- **A. Proma**, N. Pate, J. Druckman, G. Ghoshal, E. Hoque, **Personalizing LLM Responses to Combat Political Misinformation**, ACM UMAP, 2025 [[Publication](#)]

Preprints

- **A. Proma**, N. Pate, G. Ghoshal, J. Druckman, E. Hoque, **Can LLMs Emulate Human Belief Dynamics?** arXiv., 2026 [[Preprint](#)]
- **A. Proma**, N. Pate, J. Druckman, G. Ghoshal, H. He, E. Hoque, **Personalized Large Language Models Can Increase the Belief Accuracy of Social Networks** arXiv., 2025 [[Preprint](#)]
- **A. Proma**, N. Pate, J. Druckman, G. Ghoshal, H. He, E. Hoque, **How LLMs Fail to Support Fact-Checking** arXiv., 2025 [[Preprint](#)]
- N. Pate, **A. Proma**, H. He, J. Druckman, D. Molden, G. Ghoshal, E. Hoque, **Replicating Human Motivated Reasoning Studies with LLMs** arXiv., 2026 [[Preprint](#)]
- M. N. Shopnil, S. Duwal, A. Tyagi, **A. Proma**, **MIRAGE: Agentic Framework for Multimodal Misinformation Detection with Web-Grounded Reasoning** arXiv., 2025 [[Preprint](#)]

Workshops/Doctoral Consortium

- S. Duwal, M. N. Shopnil, A. Tyagi, **A. Proma**, **Evidence-Grounded Multimodal Misinformation Detection with Attention-Based GNNs**, CVPRW PP-MisDet, 2026 [[Publication](#)]
- **A. Proma**, **Understanding the Rigidity of Beliefs in Temporal Social Networks**, 11th Int'l Conference on Affective Computing and Intelligent Interaction Workshops and Demos(ACIIW), 2023 [[Publication](#)]
- **A. Proma**, M. S. Islam, S. Ciko, R. A. Baten, E. Hoque, **NADBenchmarks – a compilation of Benchmark Datasets for Machine Learning Tasks related to Natural Disasters**. The Role of AI in Responding to Climate Change, AAAI Fall Symposium Series, 2022 [[Publication](#)]
- M. S. Islam, **A. Proma**, Y. Zhou, S. N. Akter, C. Wohn, E. Hoque, **KnowUREnvironment: An Automated Knowledge Graph for Climate Change and Environmental Issues**, The Role of AI in Responding to Climate Change, AAAI Fall Symposium Series, 2022 [[Publication](#)]

Invited Articles

- **A. Proma**, R. Wachter, E. Hoque. **The Untapped Potential of Computing and Cognition in Tackling Climate Change**, NAE Perspectives, 2023

Talks, Posters and Extended Abstracts

- Extended Abstracts/Posters titled 'Can LLMs emulate Human Belief Dynamics' and 'Replicating Motivated Reasoning Studies with LLMs' at **IC2S2**, July 2026
- Extended Abstracts/Posters titled 'The role of LLMs in Tackling Misinformation during the 2024 US Elections' and 'Exploring the Role of Randomization on Belief Rigidity in Online Social Networks' at **IC2S2**, July 2025
- Research talk at **ACM NYCWiC**, April 2025

Technical Skills

- **Programming Languages:** Python, R, Java, ReactJS, Javascript, HTML, CSS
- **Frameworks:** LangChain, TensorFlow, Keras, PyTorch, OpenCV, SenticNet
- **Software:** Ollama, Tableau, Empirica, MongoDB, Figma, Canva, Meteor Galaxy, AWS

Recognition

- Selected for **Summer Institutes in Computational Social Science-Rochester**, 2024
- Selected for **CRA-WP Grad Cohort**, 2023 and 2022
- Awarded Research Grant from **ICT Ministry of Bangladesh**, 2018
- Vice Chancellor's list and Dean's list, BRAC University

Professional Services

- **Graduate Representative**, Department of Computer Science, University of Rochester, 2025-2026
- **Student Volunteer**, IEEE VIS Conference, 2024
- **Mentor**, [Fatima Fellowship](#), 2024-2025 Cohort
- **Committee Member**, Ph.D. Admissions Committee, Department of Computer Science, University of Rochester, 2022
- **Reviewer**, ICWSM 2026, ICLR 2026, CHI 2026, IUI 2026, ICLR 2025, CHI 2025, WiML Workshop at NeurIPS 2024, ACII 2023, ACIIW 2023