**Tauseef Ibne Mamun**
tauseefmamun012@gmail.com
https://tmamun.netlify.app
+1 (857)-574-9931

## INTERESTS

Patient Safety:

- Investigating innovative strategies and technologies to improve healthcare quality.
- Addressing systemic challenges to reduce medical errors and improve patient outcomes through safety protocols within the routine workflow. Creating safety protocols for unanticipated workflows.
- Ensure *systematic implementation* of evidence-based interventions to confirm their effectiveness.

Explainable AI (XAI):

- Advancing methodologies to make AI systems interpretable and transparent in autonomous systems.
- Ensuring the efficiency of explainable AI integration within clinical workflows to optimize healthcare decision-making processes.
- XAI system-based operator training for autonomous systems.

## EDUCATION

Michigan Technological University | Houghton, MI
**Ph.D. Applied Cognitive Science and Human Factors** 2019 – 2023

Advisor: Dr. Shane T. Mueller
Dissertation: Mamun, T. I. (2023). *Investigating Collaborative Explainable AI (CXAI)/Social Forum as an Explainable AI (XAI) Method in Autonomous Driving (AD)* (Doctoral dissertation, Michigan Technological University).

Michigan Technological University | Houghton, MI
**MS Applied Cognitive Science and Human Factors** 2019 – 2021

Advisor: Dr. Shane T. Mueller
Thesis: Mamun, T. I. (2021). *Investigating the Impact of Online Human Collaboration in Explanation of AI Systems* (Thesis, Michigan Technological University).

Ahsanullah University of Science and Technology | Dhaka, Bangladesh
**BS Computer Science & Engineering** 2011 – 2015

CERTIFICATES:

Implementation Science Institute – MSHP | Philadelphia, PA
**2024 Penn Implementation Science Institute** 2024

Michigan Technological University | Houghton, MI
**Graduate Certificate Artificial Intelligence in Healthcare** 2020 – 2021

INDUSTRY PRACTICUM:

- Defense Advanced Research Projects Agency (DARPA)'s Explainable Artificial Intelligence (XAI) Project
  Supervisor: Dr. Robert Hoffman
  Institute for Human and Machine Cognition
  2020

- RAIL CROSSING VIOLATION WARNING APPLICATION (Federal Railroad Administration's Project)
  Supervisor: Dr. Elizabeth Veinott
  Center for Human-Centered Computing, Michigan Tech
  2021

## AWARDS/FELLOWSHIP

- 3rd Place in Computing[MTU] showcase Poster Session 2022.
  Link: https://blogs.mtu.edu/icc/2022/10/computingmtu-showcase-poster-session-winners/
- Recipient of MTU's Doctoral Finishing Fellowship – Fall 2023.
  Link: https://blogs.mtu.edu/gradschool/2023/09/11/doctoral-finishing-fellowship-fall-2023-recipient-tauseef-ibne-mamun/

## PROFESSIONAL EXPERIENCE

**Vanderbilt University Medical Center | Nashville, TN**
Research Fellow Trainee, 2025 – Current
**Task(s):**
- Project Management
- Project focus: Patient Perspective on Artificial Intelligence and Medical Chatbot

Advisors: Dr. Laurie Novak and Dr. Megan E. Salwei

**Perelman School of Medicine at the University of Pennsylvania | Philadelphia, PA**
Postdoctoral Researcher, 2024 – 2025
Contributing to the Handoffs and Transitions in Critical Care (HATRICC) Research Project, funded by an NIH Research Project Grant (R01)
**Task(s):**
- Contextual Inquiry (CI) involving subject matter experts engaged in the handoff process between the operating room (OR) and the intensive care unit (ICU)
- Qualitative data analysis

- Mentoring undergraduate students on the human-centric aspects of their studies

Advisor: Dr. Meghan Lane-fall of the University of Pennsylvania

**Michigan Technological University, Cognitive and Learning Sciences | Houghton, MI**
Research Assistant, July 2018 – December 2023
**Task(s):**

- Social media data analysis (qualitative data) and human behavior analysis in autonomous driving while giving user-centric explanations from social media for human-AI collaboration.
- Designing novel explanation methods for the human-AI team for Defense Advanced Research Projects Agency (DARPA)'s Explainable Artificial Intelligence (XAI) project.
- Developing computational models for different scenarios, e.g., pandemic human travel patterns (https://stmueller.github.io/epidemic-agents).
- Behavioral analysis of drivers in rail crossings through statistical models and semi-structured interviews; also determining the usability of new systems in rail crossings for Federal Railroad Administration (FRA) funded projects.

Advisors: Dr. Shane T. Mueller and Dr. Elizabeth Veinott of Michigan Technological University

**Mighty Egg Technologies | Canada/Bangladesh**
Programmer Analyst, 2015 – 2018
**Tasks:**

- Database Design & API development.
- Web and Mobile App Development.
- Software deployment in Amazon Web Service Digital Ocean, Heroku.

## PUBLICATION AND PRESENTATIONS

***Peer-reviewed Journal Articles:***

- Alam, L., **Mamun, T.I.**, & Mueller, S. (2024) Application of Cognitive Empathy Elements into AI chatbots: An Interview Study Exploring Patient-Physician Interaction. Journal of Cognitive Engineering and Decision Making, In Review.
- Linja, A., **Mamun, T. I.**, & Mueller, S. T. (2022). When Self-Driving Fails: Evaluating Social Media Posts Regarding Problems and Misconceptions about Tesla's FSD Mode. *Multimodal Technologies and Interaction*, *6*(10), 86.
- **Mamun, T. I.**, & Alam, L. (2021) Predicting Depression using a Biochemistry Profile and Machine Learning for Better Risk Stratification. *International Journal of Computer Applications*, *975*, 8887.
- **Mamun, T. I.**, & Alam, L. (2016). Android Security Vulnerabilities Due to User Unawareness and Frameworks for Overcoming Those Vulnerabilities. *International Journal of Computer Applications*, *975*, 8887.
- Onik, A. R., Haq, N. F., Alam, L., & **Mamun, T. I.** (2015). An analytical comparison on filter feature extraction method in data mining using J48 classifier. *International Journal of Computer Applications*, *124*(13).

***Peer-reviewed Conference Proceedings:***

- **Mamun, T. I.**, & Mueller, S. T. (2024, September). Exploring Learning Paths: Understanding the Learning Strategies of Artificial Intelligence System Users and Their Involvement in Social Forums. In *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*, In Press.
- **Mamun, T. I.**, & Mueller, S. T. (2024, September). Exploring Learning Paths: Understanding the Learning Strategies of Artificial Intelligence System Users and Their Involvement in Social Forums. In *Proceedings of the Human Factors and Ergonomics Society Annual Meeting* (in press).
- Nadri, C., Lautala, P., Veinott, E. S., **Mamun, T. I.**, Dam, A., & Jeon, M. (2023, September). Improving Safety At Highway-Rail Grade Crossings Using In-Vehicle Auditory Alerts. In *Adjunct Proceedings of the 15th International Conference on Automotive User Interfaces and Interactive Vehicular Applications* (pp. 346-347).
- **Mamun, T. I.**, & Mueller, S. T. (2023, September). The use of social forums to train users about shortcomings of Tesla Full Self-Driving (FSD). In *Proceedings of the Human Factors and Ergonomics Society Annual Meeting* (Vol. 67, No. 1, pp. 2447-2453). Sage CA: Los Angeles, CA: SAGE Publications.
- **Mamun, T. I.** , Alam, L., Hoffman, R. R., & Mueller, S. T. (2022, September). Assessing Satisfaction in and Understanding of a Collaborative Explainable AI (Cxai) System through User Studies. In *Proceedings of the Human Factors and Ergonomics Society Annual Meeting* (Vol. 66, No. 1, pp. 1270-1274). Sage CA: Los Angeles, CA: SAGE Publications.
- **Mamun, T. I.**, Baker, K., Malinowski, H., Hoffman, R. R., & Mueller, S. T. (2021, September). Assessing collaborative explanations of ai using explanation goodness criteria. In *Proceedings of the Human Factors and Ergonomics Society Annual Meeting* (Vol. 65, No. 1, pp. 988-993). Sage CA: Los Angeles, CA: SAGE Publications.
- **Mamun, T**. **I.**, Hoffman, R. R., & Mueller, S. T. (2021, July). Collaborative Explainable AI: A non-algorithmic approach to generating explanations of AI. In *International Conference on Human-Computer Interaction* (pp. 144-150). Springer, Cham.
- Mueller, S. T., Alam, L., Funke, G. J., Linja, A., **Mamun, T. I.**, & Smith, S. L. (2020, December). Examining methods for combining speed and accuracy in a Go/No-Go vigilance task. In *Proceedings of the Human Factors and Ergonomics Society Annual Meeting* (Vol. 64, No. 1, pp. 1202-1206). Sage CA: Los Angeles, CA: SAGE Publications.

***Technical and Archival Reports***

- Zhang, K., Lautala, P., Souleyrette, R. R., Tan, Y., Yang, Y., Hung, Y. C., ... & Wang, T. (2023). *Developing Safe and Efficient Driving and Routing Strategies at Railroad Grade Crossings based on Highway-Railway Connectivity* (No. DOT/FRA/ORD-23/14). United States. Department of Transportation. Federal Railroad Administration.
- Mueller, S. T., Veinott, E. S., Hoffman, R. R., Klein, G., Alam, L., **Mamun, T. I.**, & Clancey, W. J. (2021). Principles of explanation in human-AI systems. *arXiv preprint arXiv:2102.04972*.
- Mueller, S. T., **Mamun, T. I.**, & Hoffman, R. R. (2021). *Development and Investigation on a Collaborative XAI System (CXAI)*. Institute for Human and Machine Cognition.

- Mueller, S. T., Cischke, K., Alam, L., & **Mamun, T. I.** A Computational Cognitive Model of Informative and Persuasive Explanations of Artificial Intelligence Systems. Institute for Human and Machine Cognition.
- Mueller, S., Hoffman, R., Klein, G., **Mamun, T. I.**, & Jalaeian, M. (2021). Non-algorithms for Explainable Artificial Intelligence. *Applied AI Letters*.

## TEACHING

- Serving as a guest lecturer for the HF 5860 - Human Factors Tools/Techniques course at Michigan Tech.
- Organizing study groups focused on statistical courses.

Mentorship:

- Provided guidance and mentorship to numerous undergraduate and graduate students with diverse interdisciplinary backgrounds at Michigan Tech. Involved in teaching both quantitative and qualitative data analysis for experiments related to explainable AI (XAI) systems and autonomous vehicles.
- Co-mentorship of the Undergraduate Co-op program at Drexel University alongside Dr. Ellen Bass. Currently mentoring on conducting usability analysis for systems.

Notable work: Mamun, T. I., **Baker, K.**, **Malinowski, H.**, Hoffman, R. R., & Mueller, S. T. (2021, September). Assessing collaborative explanations of AI using explanation goodness criteria. In *Proceedings of the Human Factors and Ergonomics Society Annual Meeting* (Vol. 65, No. 1, pp. 988-993). Sage CA: Los Angeles, CA: SAGE Publications.

## LEADERSHIP EXPERIENCE

Vice President
**Bangladeshi Student Association at Michigan Technological University** 2020 – 2021

Vice President
**Ahsanullah University of Science & Technology's Computer Science & Engineering Society** 2014 – 2015

President (Photography Department)
**Notre Dame Nature Study Club** 2009 – 2010

## SKILLS

- Behavioral Studies with Human Subjects
- Usability Evaluation in both Real-time and Simulated Environments (eye-tracking, driving simulator, in-vehicle systems, healthcare systems)
- Cognitive Task Analysis (CTA)
- Computational Modeling
- Software Development
- Development of R libraries for Data Management and Interpretation
- Project Management

***Summary:***

***Technical***: R, Python, C, PHP, Java, C++, Ruby, PEBL **(*Git*: GitHub - https://github.com/tm012)**
***Research***: Cognitive Task Analysis, Usability Evaluation, Contextual Inquiry, Computational Modeling
***Development***: R libraries for data management, XAI system
***Project Management***: Scrum, Agile