Tauseef Ibne Mamun

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RESEARCH INTERESTS

Patient Safety:
- Investigating innovative strategies and technologies to enhance healthcare quality.
- Addressing systemic challenges to reduce adverse events and improve patient outcomes.

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).

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

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

- PROJECT: **EXPLAINABLE AI (XAI) DARPA Program**
    Supervisor: Robert Hoffman
    Institute for Human and Machine Cognition
    2020

- PROJECT: **RAIL CROSSING VIOLATION WARNING APPLICATION (FRA Project)**
    Supervisor: 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

Perelman School of Medicine at the University of Pennsylvania | USA
Postdoctoral Researcher, 2024 – Current
Task(s):
- Contextual Inquiry involving subject matter experts engaged in the handoff process between the operating room (OR) and the intensive care unit (ICU).
Advisors: Dr. Ellen Bass of Drexel University and 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) project.
- Developing computational models for different scenarios, e.g., pandemic human travel patterns.
- 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.

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:

- 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:

- 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 Human Factors Tools course.
- Organizing study groups focused on statistical courses.

Mentorship: Provided guidance and mentorship to numerous undergraduate and graduate students with diverse interdisciplinary backgrounds.

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

Software and Programming Expertise

- R Statistical program
- Python
- C
- PHP
- Psychology Experiment Building Language (PEBL)
- Ruby
- C++
- Java
- Ruby