

Homaira Huda Shomee

PhD Researcher

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Education

Aug 2023 - Ongoing	University of Illinois Chicago <i>PhD in Computer Science</i> GPA: 4.00/4.00	Chicago, IL
Jan 2017 - Dec 2020	Brac University <i>B.Sc in Computer Science and Engineering</i> CGPA: 3.93/4.00 <i>Thesis: Alzheimer's Disease Detection and Classification using Transfer Learning Technique and Ensemble on Convolutional Neural Networks.</i>	Dhaka, Bangladesh

Research Interest

Data Science | Multimodal Learning | Graph Neural Networks | Large Language Model Evaluation | Retrieval-Augmented Generation

Research Experience

- Conducting research on multimodal analysis, multimodal data generation, large language model evaluation, patent drafting, and retrieval-augmented generation. (Advisor: *Dr. Sourav Medya*)
- Conducted research on generative adversarial networks (GANs) for high-quality synthetic fingerprint generation and realistic gastrointestinal polyp image synthesis using deep learning techniques. (Advisor: *Dr. S. M. Mahbubur Rahman*)
- Applied existing deep learning and transfer learning techniques for license plate detection and recognition in Bangladeshi vehicles through a multi-step approach, and utilized ensemble methods for Alzheimer's disease detection and classification. (Advisor: *Dr. Mohammad Zavid Parvez*)

Ongoing Works

- [1] H.H. Shomee, S.K. Maity, and S. Medya, "Patent Drafting with Large Language Models." [Work in Progress]
- [2] B. Wilk, H.H. Shomee, S.K. Maity, and S. Medya, "Fact-Based Counter Narrative Generation to Combat Hate Speech." [Under review at *The Web Conference (WWW, 2025)*]
- [3] Z. Wang, H.H. Shomee, S.N. Ravi, and S. Medya, "PATENTCLIP: Multimodal Analyses of Design Patents." [Under review at *The IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR, 2025)*]
- [4] H.H. Shomee, Z. Wang, S.N. Ravi, and S. Medya, "A Comprehensive Survey on AI-based Methods for Patents." [Preprint]

Conferences Attended

- H.H. Shomee, "IMPACT: A Large-scale Integrated Multimodal Patent Analysis and Creation Dataset for Design Patents," NeurIPS 2024, Vancouver, Canada, December 2024. (Poster Presentation)

Awards

- NeurIPS 2024 Scholar Award (Travel Grant)

Publications

Conference	<div><div>[C4] H.H. Shomee, Z. Wang, S.N. Ravi, and S. Medya, "IMPACT: A Large-scale Integrated Multimodal Patent Analysis and Creation Dataset for Design Patents," Advances in Neural Information Processing Systems (NeurIPS, 2024). [accepted]</div><div>[C3] A. Sams and H. H. Shomee, "GAN-based realistic gastrointestinal polyp image synthesis," 2022 IEEE 19th International Symposium on Biomedical Imaging (ISBI), 2022.</div><div>[C2] H. H. Shomee and A. Sams, "License plate detection and recognition system for all types of Bangladeshi vehicles using multi-step deep learning model," 2021 Digital Image Computing: Techniques and Applications (DICTA), 2021.</div><div>[C1] S. U. Sadat, H. H. Shomee, A. Awwal, S. N. Amin, M. T. Reza and M. Z. Parvez, "Alzheimer's Disease Detection and Classification using Transfer Learning Technique and Ensemble on Convolutional Neural Networks," 2021 IEEE International Conference on Systems, Man, and Cybernetics (SMC), 2021, pp. 1478-1481</div></div>
Journal	<div><div>[J1] A. Sams, H. H. Shomee, and S. M. Rahman, "HQ-finGAN: High-quality synthetic fingerprint generation using GANs," <i>Circuits, Systems, and Signal Processing</i>, vol. 41, no. 11, pp. 6354-6369, 2022.</div></div>

Work Experience

Jan 2024 - Ongoing	<div><div>University of Illinois ChicagoChicago, IL</div><div>Graduate Research Assistant</div><div><ul style="list-style-type: none">Conducting research on multimodal analysis, multimodal data generation, large language model evaluation, patent drafting, and retrieval-augmented generation.</div></div>
Jan 2025 - May 2025	<div><div>University of Illinois ChicagoChicago, IL</div><div>Graduate Teaching Assistant</div><div><ul style="list-style-type: none">Supervised both undergraduate and graduate students with course works and projects for "Introduction to Data Science" course.</div></div>
Aug 2023 - Dec 2023	<div><div>University of Illinois ChicagoChicago, IL</div><div>Graduate Teaching Assistant</div><div><ul style="list-style-type: none">Supervised senior undergraduate students with course works and projects for "Computer Design" course.</div></div>
June 2021 - May 2023	<div><div>Brac University, BangladeshDhaka, Bangladesh</div><div>Lecturer</div><div><ul style="list-style-type: none">Instructed Theory Courses: Programming Language I Programming Language II Discrete MathematicsInstructed Laboratory Courses: Introduction to Computer Science Programming Language I Programming Language II Operating Systems Database Systems Computer Graphics</div></div>
Sep 2019 - Oct 2020	<div><div>Brac University, BangladeshDhaka, Bangladesh</div><div>Student Tutor/Teaching Assistant</div><div><ul style="list-style-type: none">Contributed to grading and facilitated lab sessions.</div></div>

Services

Reviewer

- 2024: The Web Conference 2025 (WWW).
- 2024: 6th IEEE Symposium on Computers & Informatics (IEEE ISCI).
- 2021: IEEE International Conference on Systems, Man, and Cybernetics (IEEE SMC).

Mentoring Experience

- Guaranteed Paid Internship Program (GPIP) for Freshman Students**
Mentored four UIC freshman students in collaboration with a faculty mentor to strengthen their practical skills in Machine Learning and academic research.
- Early Research Scholars Program (ERSP)**
Mentored two UIC undergraduates in the Early Research Scholars Program with a focus on countering hate speech. Assisted them in learning research methodologies and developing problem-solving skills.