

Alif Al Hasan

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Cleveland, OH, USA

EDUCATION

- **Ph.D. in Computer Science** August 2025 – May 2030 (Expected)
Case Western Reserve University | Advisor: Dr. Sumon Biswas Cleveland, OH, USA
- **M.S. in Computer Science and Engineering | CGPA: 3.85/4.00** July 2023 – December 2024
Jahangirnagar University Dhaka, Bangladesh
- **B.S. in Computer Science and Engineering | CGPA: 3.63/4.00** February 2018 – June 2023
Jahangirnagar University Dhaka, Bangladesh

RESEARCH EXPERIENCE

- **Graduate Research Assistant** August 2025 – Present
Case Western Reserve University, Cleveland, OH, USA Advisor: Dr. Sumon Biswas
 - **Operational Safety of Code LLMs [C.1]:** Investigated failure modes of agentic code assistants through large-scale empirical evaluation to characterize vulnerabilities in automated program generation.
 - Designed evaluation protocols and analyzed state-of-the-art code agents and LLMs to quantify reliability and safety limitations in software engineering workflows.
- **Remote Research Assistant** May 2024 – July 2025
Missouri University of Science and Technology, Rolla, MO, USA Advisor: Dr. Mia Mohammad Imran
 - **Learning Programming in Informal Space [C.2]:** Conducted an empirical study of **1,500 online posts** using Llama-3.1-70B to model novice programmers' emotional experiences and derive design implications for affect-aware learning support.
 - **CDDRefactorER [C.3]:** Developed an LLM-guided code refactoring framework and evaluated it on MBPP and APPS, reducing refactoring failures by **54–71%** and improving novice function identification by **31.3%** in a controlled user study ($n = 20$).
 - **LLPut [W.1]:** Constructed a benchmark of **206 verified Linux coreutils bug reports** for evaluating automated input extraction and demonstrated that generative LLMs consistently outperformed encoder-based baselines.
- **Research Assistant** November 2023 – July 2024
Jahangirnagar University, Dhaka, Bangladesh Advisor: Dr. Musfique Anwar
 - **SEAGET [J.1]:** Proposed a graph-enhanced transformer incorporating seasonal and temporal activity signals for next POI recommendation, achieving a **13.7% improvement in Acc@1** over prior baselines.

PUBLICATIONS

C=CONFERENCE, J=JOURNAL, W=WORKSHOP, U=UNDER REVIEW

- [C.1] [ASE '26] A. A. Hasan and S. Biswas. "What Breaks When LLMs Code? Characterizing Operational Safety Failures of Agentic Code Assistants". In: *Proceedings of the 41st International Conference on Automated Software Engineering (ASE)*. Status: Accepted. Preprint: arXiv:2605.30777. 2026
- [C.2] [ICSE-SEET '26] A. A. Hasan*, S. Saha*, and M. M. Imran. "Learning Programming in Informal Spaces: Using Emotion as a Lens to Understand Novice Struggles on r/learnprogramming". In: *Proceedings of the 48th International Conference on Software Engineering: Software Engineering Education and Training (ICSE-SEET)*. Status: Accepted. Preprint: arXiv:2511.22789. 2026
- [C.3] [EASE '26] S. Saha, A. A. Hasan, F. T. Shifat, and M. M. Imran. "Improving Code Comprehension through Cognitive-Load Aware Automated Refactoring for Novice Programmers". In: *Proceedings of the 30th International Conference on Evaluation and Assessment in Software Engineering (EASE)*. Status: Accepted. Preprint: arXiv:2603.16791. 2026
- [J.1] [Array] A. A. Hasan and M. M. Anwar. "SEAGET: Seasonal and active hours guided graph enhanced transformer for the next POI recommendation". In: *Array* 26 (2025). DOI: [10.1016/j.array.2025.100385](https://doi.org/10.1016/j.array.2025.100385)
- [W.1] [LLanMER @ FSE '25] A. A. Hasan, S. Saha, M. M. Imran, and T. S. Zaman. "LLPut: Investigating Large Language Models for Bug Report-Based Input Generation". In: *Proceedings of the 33rd ACM International Conference on the Foundations of Software Engineering*. FSE Companion '25. 2025. DOI: [10.1145/3696630.3728701](https://doi.org/10.1145/3696630.3728701)
- [U.1] [EMNLP '26] A. A. Hasan and S. Biswas. "The Refusal-Compliance Tradeoff: A Large-Scale Safety Behavior Audit of Large Language Models". In: *Under Review at the International Conference on Empirical Methods in Natural Language Processing (EMNLP)* (2026)

SELECTED PROJECTS

- **Operational Robustness of Code LLMs via Counterfactual Prompt Interventions** Spring 2026
Python, Causal Inference, BigCodeBench, Bandit
 - Conducted a causal evaluation of prompt sensitivity in code generation using **1,140 BigCodeBench tasks** and **38,760 generated samples** under demographic and geographic interventions.
 - Introduced a *Valid Security Rate* metric that conditions security on functional execution, revealing a **56 percentage-point gap** between reported and executable security.
- **Finding the Cause of LLM Bias: A Probabilistic Graphical Modeling Approach** Spring 2026
Python, pgmpy, vLLM
 - Developed a causal fairness framework using Bayesian Networks and Pearl's intervention formalism to estimate demographic effects on LLM safety behavior.
 - Generated and analyzed **60,000 responses** across **three open-weight LLMs**, isolating demographic-specific refusal behavior after controlling for topic toxicity.
- **System-of-Models for Efficient Code Generation** Spring 2026
Python, Multi-Agent Systems, Test-Driven Development
 - Conducted an ablation study across **19 collaborative code-generation architectures** to study the correctness–efficiency tradeoff.
 - Proposed an execution-grounded TDD framework achieving **90.85% Pass@1**, surpassing a 32B baseline while reducing peak VRAM usage by **68%**.
- **Fairness Analysis of Text-to-Image Models in Negative Role Depictions** Fall 2025
Python, PyTorch, Diffusers 
 - Evaluated demographic bias in text-to-image generation under negative role prompts and developed an auditing pipeline using FairFace.
 - Demonstrated that prompt-level interventions reduced racial and age bias amplification while gender skew remained persistent.

QUANTITATIVE & ALGORITHMIC ACHIEVEMENTS

- **Quantitative Aptitude: GRE Quantitative Reasoning: 170/170** (Perfect Score).
- **Algorithmic Profile:** Codeforces Max: **2033** (Top 2%); CodeChef Max: **2084** (Top 2%); Solved **4500+** algorithmic problems across online judges.
- **ICPC Achievements:** Ranked **3rd/165** in ICPC Asia Dhaka Regional '21; **7th/1640** in ICPC Dhaka Preliminary '21; **17th/58** in Asia West Continent Finals '21.
- **National Contests:** Ranked **1st/57** in MBSTU IDPC '20; **12th/114** in BUET IUPC '22; **12th/97** in RUET IUPC '22; **14th/105** in AUST IUPC '22.

TEACHING EXPERIENCE

- **Graduate Teaching Assistant** January 2026 – May 2026
Case Western Reserve University, Cleveland, OH, USA CSDS 393/493: Software Engineering
 - Supported instruction and evaluated team projects for a **75-student** software engineering course.
- **Graduate Teaching Assistant** August 2025 – December 2025
Case Western Reserve University, Cleveland, OH, USA CSDS 325/425: Computer Networks
 - Supported instruction, project supervision, and assessment for a **65-student** undergraduate/graduate computer networks course.
- **Teaching Assistant** December 2021 – April 2024
Jahangirnagar University, Dhaka, Bangladesh Data Structures and Algorithms
 - Led algorithmic training sessions and mentored students in data structures, problem solving, and competitive programming.
- **Competitive Programming Mentor** August 2023 – December 2023
Netrokona University, Netrokona, Bangladesh Competitive Programming
 - Designed and delivered training sessions to prepare students for regional ICPC and IUPC competitions.

HONORS AND AWARDS

- **Government Scholarship for Academic Excellence** October 2025
Ministry of Education, Bangladesh
 - Awarded for academic excellence at Jahangirnagar University.
- **National Science and Technology (NST) Fellowship** February 2025
Ministry of Science & Technology, Bangladesh
 - Competitive research fellowship supporting M.Sc. thesis work (\$700 award).
- **Dean's Scholarship** 2018 – 2024
Jahangirnagar University
 - Awarded **five times** for sustained academic performance during B.Sc. and M.Sc. studies.

PROFESSIONAL SERVICE

- **Instructor: Workshop on Competitive Programming Strategies**

November 2024

Bangladesh Digital University

- Delivered an invited workshop on competitive programming and algorithmic problem solving for **90+ participants**, including contest-based practice sessions.

- **Judge, Organizer & Trainer: CodeElevate Camp 2023**

September 2023

Jahangirnagar University



- Organized training activities, delivered a session on graph algorithms, and authored contest problems for **100+ participants**.

- **Judge & Organizer: Brain Muscle Checking Contest 2022**

January 2022

Jahangirnagar University



- Designed and authored algorithmic programming challenges for university-level competition events.

TECHNICAL SKILLS

- **Programming:** Python, C/C++, Java, SQL
- **Machine Learning & AI:** PyTorch, TensorFlow, Hugging Face Transformers, Scikit-learn
- **LLMs & Generative AI:** Large Language Models (LLMs), LLM Agents, Retrieval-Augmented Generation (RAG), Diffusion Models
- **Software & Systems:** Linux, Git, Bash, REST APIs, CI/CD, LaTeX
- **Research Tooling:** vLLM, Statistical Analysis, Causal Inference, Benchmark Design, Empirical Evaluation
- **Research Areas:** Software Engineering, AI Safety, LLM Evaluation, Automated Program Repair, AI Fairness