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EDUCATION

Master of Science in Software Engineering, <i>Institute of Information Technology, University of Dhaka</i>	Apr '25 – Oct '26 CGPA: 3.92/4.00
Bachelor of Science in Software Engineering, <i>Institute of Information Technology, University of Dhaka</i>	Jan '20 – Mar '25 CGPA: 3.94/4.00

RESEARCH INTERESTS

- | | |
|--|--|
| • AI Safety & Responsible AI
Alignment, Interpretability, LLM Evaluation | • AI for Software Engineering (AI4SE)
LLM-based Code Generation & Analysis |
| • Trustworthy Generative AI
Watermarking, Attribution, Provenance | • Agentic AI Systems
Multi-Agent Frameworks, Secure Coding Agents |

PUBLICATIONS & PREPRINTS

- [1] **Fahad, I. A.**, & Fuad, M. M. N. (2026). Can We Trust the Source? A Systematic Review of Watermarking and Attribution for AI-Generated Code. *Information and Software Technology*, Elsevier, 108157. [Journal] ↗
- [2] **Fahad, I. A.**, Fuad, M. M. N., & Sakib, K. (2026). PromptMark: A Prompt-Guided Iterative-Feedback Framework for Source Code Watermarking. *Proc. 21st International Conference on Evaluation of Novel Approaches to Software Engineering (ENASE)*. [Conference Proceedings]
- [3] Hasan, M., **Fahad, I. A.**, Arefin, M. F., Khan, M. M. (2026). CHARD: Characteristic-aware hierarchical detection for Bangladesh road scenes. *IEEE Access*. Accepted for publication. [Journal] ↗
- [4] **Fahad, I. A.**, Asif, K., & Tawhid, M. N. A. (2026). Mitigating LLM Sycophancy in Code Smell Detection Using Evidence-Guided Reasoning Prompts. *arXiv preprint arXiv:2607.10411*. [Preprint] ↗
- [5] **Fahad, I. A.**, Areean, A. I. H., Ahmed, N. S., & Hasan, M. (2025). Automatic vehicle detection using DETR: A transformer-based approach for navigating treacherous roads. *arXiv preprint arXiv:2502.17843*. [Preprint] ↗
- [6] **Fahad, I. A.**, Asif, K., & Sikder, S. (2025). BanglaFake: Constructing and Evaluating a Specialized Bengali Deepfake Audio Dataset. *arXiv preprint arXiv:2505.10885*. [Preprint] ↗

RESEARCH EXPERIENCE

Distributed Systems & Software Engineering (DSSE) Research Group ↗ **Feb '25 – Present**
Research Assistant (RA) — Advisor: Dr. Kazi Muheymmin-Ul-Sakib

- Conducted my Master's thesis on source code watermarking and attribution for AI-generated code focusing on black-box API-only models.
- Designed a prompt-guided iterative feedback framework to improve watermark embedding and detection performance in LLM-generated code.

Data & Design Lab (DnD Lab) ↗ **Jul '25 – Present**
Research Assistant (RA) — Advisors: Dr. Moinul Islam Zaber & Dr. Sarker Tanveer Ahmed Rume

- Designed interactive dashboards for real-time power consumption monitoring, translating stakeholder requirements into actionable, user-validated visualizations.
- Led end-to-end development of the dashboard, from design through deployment.

Bangladesh Institute of Development Studies (BIDS) ↗ **Apr '26 – Jun '26**
Research Assistant (RA) — Advisor: Dr. Atonu Rabbani

- Developed SmartGeoRef, converting static maps to GeoJSON, cutting per-map processing from a week to 84 maps in weeks.
- Applied the pipeline with NLP-based analysis to assess regional economic impact across Bangladesh.

UIUC+ Summer Research Program in Software Engineering (SRSE) ↗ **May '24 – Aug '24**
Research Intern — Advisor: Prof. Darko Marinov (University of Illinois Urbana-Champaign)

- Reviewed empirical literature on automated code translation, program readability, and software bug detection.
- Enhanced experimental evaluation pipelines, improving reproducibility and benchmarking memory/performance metrics across C and Rust.

PROJECTS

- 🌀 **Mathematical Reasoning for Low-Resource Bengali (2025)** | *Python, Hugging Face, Qwen-7B, DPO, MergeKit*
 - Built specialized Bengali mathematical reasoning datasets, including Chain-of-Thought data, for low-resource training.
 - Fine-tuned **Qwen-7B** (SFT + DPO) and **BanglaT5**, then applied **mergeKit**-based model merging to improve final reasoning accuracy.
- 🌀 **Intent-Based Semantic Search System (2025)** | *Python, KeyBERT, Qdrant, FastAPI, Docker, Grafana, Prometheus*
 - Built an intent-based semantic search system using fine-tuned **BERT** and **Qdrant** vector database, deployed on Dockerized EC2 with **Grafana & Prometheus** monitoring.
 - Improved search relevance and scalability via language detection, negative-intent handling, LLM-powered filtering, and caching.
- 🌀 **PyTypeWizard: Automated Repair for Python Static Type Errors (2025)** | *VSCode Extension API, SQLite, LLM*
 - Built a **VSCode extension** for real-time detection and **LLM-based repair** of Python static type errors, using **RAG** over indexed codebases for context-aware fix generation.
 - Designed a **SQLite** schema storing code chunks, error metadata, and fixes, enabling continuous improvement via user feedback.
- 🌀 **Bengali Automatic Speech Recognition for Regional Dialects (2024)** | *Python, Deep Learning, ASR*
 - Designed and implemented an **end-to-end ASR pipeline** for Bengali regional dialects using deep learning models.
 - Curated and processed a **79+ hour speech corpus** from 373 individuals across 10 regions of Bangladesh, achieving **75% dialect-specific transcription accuracy**.
- 🌀 **EmPower: Interactive Learning Tool for Autistic Children (2024)** | *Python, PyQt5, SQLite*
 - Developed an interactive desktop learning application (Python, PyQt5) with **task scheduling, gaze-based interaction, and progress monitoring**.
 - Supported cognitive, behavioral, and social development for autistic children through structured learning activities, winning **Best Innovation Idea** at the Dhaka University Innovation Fair 2024.

PROFESSIONAL EXPERIENCE

- IIT, University of Dhaka** Jul '25 – Jul '26
Course Instructor (Python, AI for Research) On-site
 - Delivered hands-on training in **Python** and MS Office to **50+ participants**, emphasizing applied problem-solving.
 - Mentored a **PhD student** in analytical tasks and reporting using Python.
- Cefalo Bangladesh Limited** Jan '24 – Feb '25
Trainee Software Engineer On-site
 - Contributed to payroll system modules including **Salary Review, Tax Certificate, and Leave Management**.
 - Implemented **Kafka-based communication** for efficient integration with external systems.
 - Collaborated in an **Agile SCRUM environment** to ensure timely delivery and team coordination.
- Vivasoft Limited** Sep '23 – Feb '24
Software Engineer Intern Remote
 - Developed the **Vivasoft Contact Management** application with pixel-perfect UI using **TailwindCSS**.
 - Delivered **scalable, user-centric frontend solutions** in collaboration with cross-functional teams.
- Chittagong University ERP Project** May '23 – Sep '23
Assistant ERP System Analyst Remote
 - Performed **requirements analysis** and **system modeling** for a university-scale ERP system.
 - Designed **end-to-end workflows** for academic and administrative modules.
 - Analyzed **digital payment systems** integrating banking and gateway solutions with reporting mechanisms.
 - Ensured **data integrity, access control, and auditability** through stakeholder collaboration.
- Optagen Technologies** July '21 – June '22
Python Developer Remote
 - Designed and developed the **Automatic Biofloc System** desktop GUI using **PyQt5**, improving user interaction efficiency.
 - Researched and proposed **innovative cross-platform solutions** for application development.

AWARDS & HONORS

- **Research Fellowship** – ICT Division, Government of Bangladesh, 2026: Selected for Master’s thesis proposal.
- **Undergraduate Scholarship** – University of Dhaka, 2026: Awarded for securing 2nd position in undergraduate studies.
- **Ranked 6th** – AI Engineering Hackathon by Poridhi.io, 2025 (out of **85 teams**): Developed an intent-based semantic search system using Qdrant and BERT.
- **Ranked 6th** – BUET DL Sprint 3.0, 2025 (out of **70+ teams**): Fine-tuned Qwen-7B and BanglaT5 for low-resource mathematical reasoning.
- **Ranked 4th** – IUT CSE Fest Datathon, 2024 (out of **47 teams**): Developed a Bengali ASR model trained on 79+ hours of speech data.
- **Ranked 2nd** – Dhaka University Innovation Fair, 2024: Developed *EmPower*, an interactive learning tool for autistic children.
- **Ranked 3rd** – SUST DL Enigma, 2024 (out of **80+ teams**): Developed an object detection system for Bangladeshi roads using YOLO and DETR.
- **Top 2%** – Learnathon 2.0, 2024 (out of **1800+ participants**): Completed a 6-month intensive program focused on JavaScript, React, and Next.js with paid project contributions.
- **Rising Star Award** - IIT Emerging Cup Coding Contest, 2020: Recognized for exceptional performance in an internal coding contest.

EXTRA-CURRICULAR & LEADERSHIP ROLES

Aspire Institute

Jun '25 – Aug '25

Aspire Leaders Program Cohort 3 (Organizational Leadership)

- Selected as **6,175 finalists** from over **36,000 global applicants** for a guided leadership development program.
- Completed 40+ hours of masterclasses led by **Harvard Business School faculty** and other world-class educators.
- Engaged in a **faculty-designed curriculum** focused on leadership, communication, and community impact.
- Developed skills in **leadership, communication, and collaborative problem-solving** through interactive sessions.

IIT Software Engineering Community (IITSEC)

Apr '23 – Mar '24

Seminar and Library Secretary

- Organized seminars on **Blockchain** and **emerging technologies**.
- Conducted **3 GitHub** and **Linux training sessions** for 40+ freshers.
- Managed **CTF** event at **ITVerse2023**, a national IT Fest, with 50+ participants.

Bangladesh Youngster Social Organization (BYSO)

Aug '20 – Jul '21

Program Management Director

- Organized programs for **International Mother Language Day** and **Eid-ul-Fitr**, fostering community engagement.
- Initiated and led a **sewing machine donation project** to empower underprivileged women.
- Organized and led **fundraising initiatives** to support flood-affected communities.

REFERENCES

Dr. Kazi Muheymin-Us-Sakib

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Dr. B.M. Mainul Hossain

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