ANISHA ISLAM

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EDUCATION

Master of Science in Computing Science, University of Alberta, GPA: 3.9 Sep 2022 - Feb 2025

Bachelor of Science in Computer Science and Engineering, Bangladesh University of Engineering and Technology (BUET), Graduated with Honours, GPA: 3.81 Feb 2017 - May 2022

PUBLICATIONS

1. **Anisha Islam**, and Abram Hindle. TriGraph: A Probabilistic Subgraph-Based Model for Visual Code Completion in Pure Data. Accepted in 2025 *IEEE/ACM 22nd International Conference on Mining Software Repositories (MSR)*. IEEE, 2025.
2. **Anisha Islam**, Kalvin Eng, and Abram Hindle. Opening the Valve on Pure-Data: Usage Patterns and Programming Practices of a Data-Flow Based Visual Programming Language. In 2024 *IEEE/ACM 21st International Conference on Mining Software Repositories (MSR)*, pp. 492-497. IEEE, 2024.
3. **Anisha Islam**, Nipuni Tharushika Hewage, Abdul Ali Bangash, and Abram Hindle. Evolution of the Practice of Software Testing in Java Projects. In 2023 *IEEE/ACM 20th International Conference on Mining Software Repositories (MSR)*, pp. 367-371. IEEE, 2023.

WORK EXPERIENCE

Graduate Research and Teaching Assistant Sep 2022 - Dec 2024
University of Alberta *Edmonton, AB, Canada*

- Managed 6+ cross-functional Scrum teams, ensuring 100% sprint completion while mentoring team members, assisting with technical challenges, and facilitating conflict resolution between clients and teams to deliver software products on schedule.
- Conducted lab sessions on test-driven development and CI/CD pipelines with GitHub Actions and Cybera, covering code quality, test automation (Pytest, Pitest), static analysis, and technical debt management.

Software Engineering Intern May 2022 - Aug 2022
Optimizely *Dhaka, Bangladesh*

- Designed and developed an engineering dashboard using JIRA API, Grafana, Docker, and Python, improving data visibility for team analytics.
- Collaborated with senior developers, and participated in peer-reviews.
- Researched and documented alternative tech stacks, assisting in architectural decisions.

PROJECTS

TriGraph: A Probabilistic Subgraph-Based Model for Visual Code Completion in Pure Data

- Implemented a predictive model for nodes and edges in Pure Data graphs to enhance support tool availability for computer musicians, using graph analysis and statistical probabilities of subgraphs.
- Designed and built an SQLite dataset by mining Pure Data repositories from GitHub and World of Code (WoC), parsing source code and metadata to analyze usage patterns in visual programming for computer musicians.
- Achieved a **30% improvement in Mean Reciprocal Rank** over a 3-gram KenLM model for code prediction, demonstrating superior predictive capabilities.
- Published at **IEEE/ACM MSR 2025**, and **IEEE/ACM MSR 2024**.

Evolution of the Practice of Software Testing in Java Projects

- Extracted and analyzed data from **20,000 Java projects annually (2012–2021)** to study the evolution of software testing, applying Regex parsing, Git, and World of Code (WoC) for large-scale trend analysis.
- Confirmed that larger projects and those with more developers tend to have more test cases, aligning with prior studies.
- Published at **IEEE/ACM MSR 2023.**

Paper Tracker: Your Personal Research Library

- Developed and deployed a full-stack research paper management app using Next.js, MongoDB, and Vercel, enabling users to add, search, and categorize academic papers (Live Demo).
- Implemented Google authentication and CRUD operations, allowing users to securely log in, manage paper details, and organize their research effectively.
- Designed an interactive search, filter, and dashboard system, helping users track their reading history by author, publication venue, and tags.

Personal Shopper Problem Web Prototype

- Developed a web prototype for the Personal Shopper Problem, enabling route selection between shopper and customer locations based on time and cost constraints, integrating two algorithms to compute both optimal and sub-optimal linear skyline routes.
- Implemented frontend-backend interaction, with item selection and location data processed in the Flask backend, and routes displayed using Leaflet Routing Machine.

Analyzing the Traffic Crash Data of Chicago Using Clustering

- Conducted data analysis on Chicago traffic crash data, applying K-means, K-modes, OPTICS, and DBSCAN clustering algorithms to identify patterns in time, location, and accident types, extracting insights to improve road safety.
- Investigated the spatial distribution of accidents by type to identify trends and risk factors.

Easy Internet Service

- Led a 3-person team to build a web platform facilitating connections between NTTN (Nationwide Telecommunication Transmission Network), ISP (Internet Service Provider), and end users.
- Developed 90% of backend APIs (Node.js), set up and populated the MongoDB database, and built the frontend with React and CSS.

SKILLS

Programming Languages	Python, Java, JavaScript, C, C++
Databases and Frameworks	MongoDB, PostgreSQL, SQLite, Next.js, Node.js, React, Flask
Others	Natural Language Processing, Statistical Language Models, Graph Analysis, Mining Software Repositories, KDD, Data Mining, LaTeX, HTML, CSS, Git, TensorFlow, PyTorch, Shell Programming, Continuous Integration, Continuous Deployment, Docker

AWARDS AND HONORS

- **Alberta Graduate Excellence Scholarship (AGES):** University of Alberta, 2023 - 2024
- **Graduate Recruitment Scholarship:** University of Alberta, 2022 - 2023
- **University Merit Scholarship:** Bangladesh University of Engineering and Technology, Dhaka, Bangladesh, 2019 - 2021
- **Dean's List Award:** Bangladesh University of Engineering and Technology, Dhaka, Bangladesh, 2018 - 2022