ANISHA ISLAM

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EDUCATION

Master of Science in Computing Science, University of Alberta — Expected 2024
GPA: 3.9
Supervisor: Dr. Abram Hindle

Bachelor of Science in Computer Science and Engineering, Bangladesh University of Engineering and Technology (BUET) — 2017 - 2022
Graduated with Honours (CGPA: 3.81)
Supervisor: Dr. Tanzima Hashem

PUBLICATION

1. **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.
2. **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 - Current
University of Alberta — *Edmonton, AB, Canada*

- Managed cross-functional SCRUM teams to deliver software products to clients within set deadlines.
- Reviewed sprint submissions to ensure compliance with project documentation and acceptance criteria.
- Provided guidance and mentorship to team members by assisting with technical challenges, and facilitating conflict resolution between clients and teams.
- Conducted lab sessions on various topics, including test-driven development, CI/CD pipelines using GitHub Actions and Cybera, setting up self-hosted runners, code coverage, mocks, stubs, technical debt, and static analysis.
- Instructed on testing techniques such as unit testing and system testing with Pytest and mutation testing using Pitest.

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

- Created an engineering dashboard using JIRA, Grafana, Docker, and Python, with visualizations from the JIRA API and PostgreSQL.
- Collaborated with senior developers, and participated in peer-reviews.
- Researched alternate technology stacks, and documented the findings.

Intern — Feb 2021 - Mar 2021
eSystems Research and Development (eSRD) Lab — *Dhaka, Bangladesh*

- Developed an e-prescription generation system using Angular, Spring Boot, and MongoDB to digitize the prescription process, and improving accessibility for patients, doctors, and hospitals.
- Built APIs for prescription generation and profile management for hospitals, patients, and doctors.
- Recognized as the best performer with a performance rating of $> 80\%$.

SELECTED PROJECTS

Graph-Based Probabilistic Code Prediction Model for Pure Data

- Developed a predictive model for nodes and edges in Pure Data graphs to enhance support tool availability for computer musicians, using graph structures and statistical probabilities of subgraphs.
- Constructed graphs and created a corpus from parsed PD files, identifying unique tokens and calculating frequencies for 2-node and 3-node subgraphs across five training/test splits.
- Applied stupid backoff smoothing for the prediction model, outperforming an order 3 n-gram model with modified Kneser-Ney smoothing by 30%.

Analyzing the Traffic Crash Data of Chicago Using Clustering

- Conducted data analysis on Chicago traffic crash data to extract insights for improving road safety.
- Applied different clustering algorithms like K-means, K-modes, OPTICS, and DBSCAN to analyze the time, location, and patterns of traffic accidents.
- Investigated the spatial distribution of accidents by type to identify trends and risk factors.

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.
- Integrated two algorithms into the prototype 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.

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.
- Scoped the project, designed the ERD, and contributed to the Class Diagram.
- Developed 90% of backend APIs (Node.js), set up and populated the MongoDB database, and built the frontend with React and CSS.

Lines of Action

- Created a strategy game with Human vs Human and Human vs AI modes using Java and JavaFX.
- Designed AI for the game using heuristics (piece square table, area control, mobility, connectedness) to perform optimal moves in an alpha-beta pruning adversarial search.

AWARDS AND HONORS

- **Alberta Graduate Excellence Scholarship (AGES):** University of Alberta, 2023 - 2024
- **Graduate Travel Award:** University of Alberta, 2023 - 2024
- **Graduate Recruitment Scholarship:** University of Alberta, 2022 - 2023
- **Runners up (Team Tessera):** Ada Lovelace Datathon, Dhaka, Bangladesh, 2021
- **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

SKILLS

Programming Languages	Python, Java, JavaScript, C, C++, C#
Databases and Frameworks	MongoDB, PostgreSQL, Node.js, Spring Boot, React, Flask
Others	LaTeX, HTML, CSS, TensorFlow, PyTorch, Git, Shell Programming, Docker, Gradle, Continuous Integration, Continuous Deployment, Self-hosted Runners