Aszadur Rahman Rakin

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📍 Dhaka, Bangladesh

Research Interests

My research interests lie in targeted and scalable symbolic execution, the design of reliable and efficient large-scale networked systems, and systems for machine learning. Additionally, I am passionate about advanced compiler techniques for performance optimization.

Work Experience

Bangladesh University of Engineering and Technology — Dhaka, Bangladesh
Research Assistant, Dept. of CSE — *July 2024 – Present, Full-time*

- Automated Software Testing

Research Experience

Symbolic Execution to Find Bugs in Update Patches of a Medical Firmware — Research Project
University of Washington and Vanderbilt University — *September 2024 – Present*

Mentor: Dr. Yigong Hu

- Gained proficiency with symbolic execution engine techniques
- Currently, investigating program slicing methods to identify optimal sets of variables for symbolic analysis

Automated Android Testing Framework — Research Project
Bangladesh University of Engineering and Technology & Samsung Research Bangladesh — *June 2024 – Present*

Supervisor: Dr. Anindya Iqbal, Sukarna Barua

- Developed a comprehensive Android testing framework with two distinct modules: generation and execution
- Designed and implemented the generation module to create human-like test cases
- Contributed to module interaction mechanisms, specifically focusing on handling dynamic cycles in application testing
- Engineered test case generation strategies to improve bug detection and system failure identification

Do Self-Translate Prompts Always Work: A Case Study For the Non-Latin Based Bangla Language — Undergraduate Thesis
Bangladesh University of Engineering and Technology — *November 2023 – August 2024*

Supervisor: Dr. Muhammad Abdullah Adnan
Collaborators: Dr. Muhammad Abdullah Adnan , Mohammad Saqib Hasan, Mehbubul Hasan Al-Quvi

- Investigated challenges of Large Language Models (LLMs) in low-resource languages
- Investigated the efficacy of Self-Translate method for Bangla tasks.

Education

Bangladesh University of Engineering and Technology — Dhaka, Bangladesh
B.Sc. in Computer Science and Engineering; **CGPA: 3.89/4.00** — *April 2019 – July 2024*

Projects

xv6 Modification (Operating System Project) | *GitHub*
- System Call Creation, Task Scheduling Algorithm, Memory Management (Paging, Copy on Write)

MIPS Implementation (Computer Architecture Project) | *GitHub*
- Implemented 4-bit ALU, MIPS datapath with ICs and FPU in emulator(Logisim)

Simple C Compiler (Compiler Project) | *GitHub*
- Successfully designed and implemented a basic C compiler using Bison and Flex.

Automated Traffic Signaling Microcontroller System | *GitHub*
- Implemented a microcontroller-based system for traffic signaling that incorporates sophisticated and intelligent algorithms for signal updates.

Ray Tracing (Computer Graphics Project) | *GitHub*
- Implemented ray tracing in C++ for realistic scene rendering.

CoreDumped (Term Project 2-2) | *GitHub*
- **Technology Stack**: JavaScript,TypeScript,ExpressJS,React,OracleDB
- **Duration**: Dec. 30, 2021 to Feb. 28, 2022
- **Description**: A simple question answering website with blog posting feature.

Porikkha (Term Project 4-1) | *GitHub*
- **Technology stack**: Next 13.4, MongoDB, CockroachDB, Redis, VercelKV, Material UI
- Project for CSE408: Software Development course. Aims to eliminate key problems/deficiencies faced in an online exam in various platforms including Google Docs and Microsoft Teams. *Key features: Auto update responses, Anti cheat system: Mouse Movement, Switching between tabs, Keyboard, Eye tracking with webcam.*

Academic Achievements

University Merit January 2020, January 2019

University Stipend January 2022, July 2021

Dean's list July 2021, January 2019

Extracurriculars

Competitive Programming
I actively participated in competitive programming competitions during my freshmen and sophomore years.

- **ICPC Regionals Dhaka Site** Participated in ICPC 2020 Regional Dhaka - ICPC Dhaka Regional 2020 Main Round: Hosted by Dept of CSE, Dhaka University, Team - BUET_Integers
- **CodeForces**: Max Rating: 1652

Skills

Programming Languages: C/C++, Java, Python, JavaScript, TypeScript, SQL, XML, x86 Assembly, LaTeX, Bash

Operating Systems: xv6, Linux, Windows

Compiler Design Tools: Flex, Bison

Microcontrollers/Embedded Systems: Arduino, ATmega32

Framework and Libraries: Appium, ReactJS, expressJS, FastAPI, NextJS, PyTorch, HuggingFace, NLTK, Langchain

Database Management: OracleDB, PostgreSQL, MongoDB, Redis

Version Control System: Git

Cloud: AWS(VM), Google Cloud Platform(Maps), Azure(Voice Recognition, VM)

References

Dr. Muhammad Abdullah Adnan | Undergraduate Thesis Supervisor   *Google Scholar*
Professor, Dept. of CSE, BUET

Dr. Anindya Iqbal | Research Project Supervisor   *Google Scholar*
Professor, Dept. of CSE, BUET