

MD MAHIR ASEF KABIR

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EDUCATION

Ph.D. Candidate, Department of Computer Science

Aug 2019 — (Expected) Summer/Fall 2024

Virginia Tech, Blacksburg, VA

- Research topic: Helping software developers maintain project configuration well so that they encounter fewer runtime and security issues
- Teaching Assistant for - Data Structures and Algorithm, Comparative Languages, Formal Languages
- Relevant courses - Advanced Software Engineering, System And Software Security, Software Project Management

BS, Department of Computer Science and Engineering

Oct 2011 — Jan 2016

Ahsanullah University of Science and Technology, Dhaka, Bangladesh

- Mentor & Trainer at Programming Contest Club for 3 semesters
- Active participant in 10+ Inter and Intra University Programming Contests
- Relevant courses - Algorithm, Data Structures, Digital Image Processing, Network Programming with Java, Software Development

EXPERIENCE

Software Engineer, Enosis Solutions

Nov 2015 — Aug 2019

Project: Treeno Software

- Enhanced Treeno Document Management System, using .NET and jQuery, to create admin panel and user grouping
- Developed the Treeno API, using .NET Core and MS SQL Server to segregate backend code, resulting in a **60% reduction in lines of code**
- Improved code quality of Treeno API, using Dependency Injection and Generic Methods, to **reduce server communication by 50%**
- Managed a team of 4 software engineers, by reviewing code and assisting with feature implementations

Project: Insightformation

- Built features of InsightVision workflow management application, using ASP.NET MVC, Entity Framework, Fabric.js, and Telerik Reporting, to **introduce** workflow diagram **designing tool**

Training Experience

- **Trained 4 new Software Engineers** the basics of ASP.NET MVC, to get them prepared for 4 different company projects

Summer Intern, Green and Red Technologies

May 2014 — Jul 2014

Project: G&R Ad Network

- Optimized query for searching user statistic data, using SQL and caching, to improve query time from 5s to 0.042s
- Created the intern page, using PHP and HTML, to enable interns to download certificates

TEACHING EXPERIENCE

Lecturer (Part-Time), Ahsanullah University of Science and Technology, Dhaka

2016 — 2018

- Courses Instructed: Algorithm Lab, Software Development with C (iGraphics)
- Instructed 100+ students

Lecturer (Part-Time), Southeast University, Dhaka

2016 — 2018

- Courses Instructed: Java, Algorithm, Theory of Computation, Operating System
- Instructed 120+ students

CURRENT RESEARCH PROJECTS

Detection of Java Projects' Metadata Related Bugs

- Creating an external domain specific language from scratch (writing grammar syntax, generating parser, and developing language engine), using JavaCC and Java, to detect Java projects' metadata related bugs
- Discovered **15 different** metadata related **bug patterns** for Java Spring projects

How Does ChatGPT Compare with Developers?

(Submitted in FSE 24) Sep 2023

- Investigating how well Large Language Models perform compared to developers in answering technical questions, and revising code
- Discovered ChatGPT's better performance in approximately **65% cases**
- Successfully merged and **built 90%** code maintainance related changes made by ChatGPT

PUBLISHED TECHNICAL RESEARCH PROJECTS

Md Mahir Asef Kabir, Y. Wang, D. Yao and N. Meng, "How Do Developers Follow Security-Relevant Best Practices When Using NPM Packages?," Published in 2022 IEEE Secure Development Conference (SecDev), pp. 77-83, doi: [10.1109/SecDev53368.2022.00027](https://doi.org/10.1109/SecDev53368.2022.00027)

- Investigated how securely developers follow security related best practices for NPM packages
- Wrote all data-collection related scripts (web scraping & Git accessing) from scratch using Python
- Reported vulnerable, unused, and duplicate packages in **55%, 90%, & 83%** of projects respectively

Ying Zhang, Ya Xiao, Md Mahir Asef Kabir, Danfeng Yao, and Na Meng. 2022. "Example-based vulnerability detection and repair in Java code," Published in 30th IEEE/ACM International Conference on Program Comprehension (ICPC '22). doi: [10.1145/3524610.3527895](https://doi.org/10.1145/3524610.3527895)

- Worked on creating an Example-Based approach, using Java & WALA, to detect & repair security-API misuses for Java
- Created Pull Requests to communicate with developers for user studies
- Successfully detected vulnerabilities with **95% precision, 72% recall, and 82% F-score**

Y. Zhang, Md Mahir Asef Kabir, Y. Xiao, D. Yao and N. Meng, "Automatic Detection of Java Cryptographic API Misuses: Are We There Yet?," Published in IEEE Transactions on Software Engineering, vol. 49, no. 1, pp. 288-303, 1 Jan. 2023, doi: [10.1109/TSE.2022.3150302](https://doi.org/10.1109/TSE.2022.3150302)

- Investigated how far existing tools have come to detect Java Cryptographic API misuses
- Collected GitHub data using Python script, and communicated with developers for user studies

- Discovered significant gap between the state-of-the-art tools and developers' expectations`

CLUB ACTIVITIES

Core Team Member, Google Developer Student Club at Virginia Tech

Feb 2022 — Apr 2023

- Worked as the Backend Lead to help teams participating in Solutions Challenge
- Organized 4 weekly coding challenges

SKILLS

- Programming Languages: C, C++, Java, C#, JavaScript, Python
- Libraries and Frameworks: Entity Framework, jQuery, Fabric.js
- Database Management Systems: MySQL, Microsoft SQL Server
- Source Controls: TFS, SVN, Git

COMPETITIVE PROGRAMMING ACHIEVEMENTS

- 5th in SUB Inter University Programming Contest 2016, Dhaka, Bangladesh
- 15th in National Collegiate Programming Contest(NCPC) at RUET, 2015, Rajshahi, Bangladesh
- 3rd in IUBAT Inter University Programming Contest 2014, Dhaka, Bangladesh
- Used C++ and Java for problem solving with algorithms