MD MAHIR ASEF KABIR, Ph.D. Candidate

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EDUCATION

Ph.D. Candidate, Department of Computer Science, Virginia Tech, USA — **Aug 2019 — Present**
- Thesis: Enhancing software maintenance by best practice analysis and automatic bug detection using customizable rules

MS, Department of Computer Science, Virginia Tech, USA — **Aug 2019 — May 2024**

BS, Department of Computer Science and Engineering, AUST, Bangladesh — **Oct 2011 — Jan 2016**

RELEVANT COURSES

- Software Engineering, System and Software Security, Formal Languages, Data Structures and Algorithms, Database, OOP

TECHNICAL SKILLS

- Programming Languages: C, C++, Python, Java, C#, JavaScript, PHP
- Libraries, Frameworks & Paradigms: .NET, Entity Framework, jQuery, Fabric.js, AWS Lambda, Google Cloud Functions
- Database and Messaging: MySQL, Microsoft SQL Server, MongoDB, RabbitMQ
- Tools and Source Controls: TFS, SVN, Git, Docker

PUBLICATIONS

- **Md Mahir Asef Kabir**, Sk Adnan Hassan, "How Well Do ChatGPT Models Maintain Software?", Accepted at The First International Workshop on Large Language Model-Oriented Empirical Research LlanMER 2025 (Co-located with FSE 2025)
- **Md Mahir Asef Kabir**, Xiaoyin Wang, Na Meng, "Detecting Metadata-related bugs in Java Enterprise Applications", Accepted at The ACM International Conference on the Foundations of Software Engineering **(FSE) 2025**
- **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
- 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
- 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

RESEARCH EXPERIENCES

Graduate Research Assistant, Virginia Tech, USA — **Aug 2019 — Present**

Investigating LLMs' performance in Software Maintenance | *Java, Python, Git, CodeLlama, Mistral 7B, ChatGPT*

- Evaluated LLMs' performance in revising software based on maintenance requests
- **Paper accepted** at LlanMER 2025 (Co-located with FSE 2025)
- **On going work:** Fine-tuning Open Source LLMs to automatically revise software based on maintenance requests

Detection of Java Projects' Metadata Related Bugs | *JavaCC, Java, Static Program Analysis, Spring Boot*

- **Created a domain-specific language**, using JavaCC, allowing domain-experts to write custom rules for checking bugs
- Developed a language engine, using Java and Static Program Analysis, providing a platform for running the custom rules
- Identified 15 bug patterns and discovered 156 bugs from 70 Java enterprise applications
- **Paper accepted** at FSE 25

How Do NodeJS Developers Follow Security-relevant Best Practices | *Python, Git, NodeJS*

- Investigated how often NodeJS developers do not follow security-relevant best practices while maintaining NPM packages
- Evaluated the existing NPM tools' performances and found gap between necessity and available solution
- **Published a paper** in IEEE SecDev 22

How Well Do Existing Tools Detect Cryptographic API-miuses in Java projects | *Java*

- Evaluated the state of the art tools to find gap between developers' expectation and the tools' performances
- **Published a paper** in IEEE TSE 22

Detection and Repair of Security-API misuses in Java Code | *Java, Static Program Analysis*

- Created a tool SEADER to detect and repair security-API misuses in Java projects, outperforming existing tools
- **Published a paper** in IEEE/ACM ICPC 22

INDUSTRY EXPERIENCES

Software Engineer, Enosis Solutions, Bangladesh — **Nov 2015 — Aug 2019**

Treeno Software (Document Management Software) | *C#, ASP.NET MVC, MS SQL Server, .NET Core, RESTful APIs*

- Created a new admin panel, using ASP.NET MVC, and MS SQL Server, providing an enhanced admin-user experience
- **Built a RESTful API-based backend**, using .NET Core, OAuth 2.0, and MS SQL Server, cutting down 60% lines of code
- Enhanced client application performance, using Dependency Injection and Generic Methods, reducing 50% API calls

Insightformation (Workflow Management Application) | *C#, ASP.NET Web Forms, Fabric.js, Entity Framework*

- Created a designing tool, using ASP.NET Web Forms and Fabric.js, allowing users to create and edit workflow diagrams
- Implemented the workflow page, using a Graph data structure, allowing users to manage different workflow components

Summer Intern, Green and Red Technologies (Ad Network), Bangladesh   **May 2014 — July 2014**

- Optimized data storage and retrieval technique, using MySQL, improving query operation time from ~5s to 0.042s.
- Developed intern page, using PHP and HTML, allowing interns to view and download their internship certificates

TEACHING EXPERIENCES

Graduate Teaching Assistant, Virginia Tech, USA   **Aug 2019 — Present**

- Taught as a substitute instructor, and developed assignment project solutions for CS 3114: Algorithms and Data Structures
- Graded assignments, and helped students understand concepts during office hours for Comparative Languages, Formal Languages, Algorithms and Data Structures, and Software Engineering (Graduate Level)

Lecturer (Part-Time), AUST, Bangladesh   **2016 — 2018**

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

Lecturer (Part-Time), Southeast University, Bangladesh   **2016 — 2018**

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

MENTORSHIP EXPERIENCES

Enosis Solutions, Bangladesh   **Nov 2015 — Aug 2019**

- Led a team of 4 developers, reviewing code and helping with feature implementations, successfully finishing 2 projects
- Mentored 4 developers as part of a new-employee training program, successfully preparing them for 4 different teams

AWARDS AND ACHIEVEMENTS

- Served as a Committee Member in the Artifact Evaluation Committee of SLE 2024
- 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

CLUB ACTIVITIES

Student Organizer, Stack@CS Reading Group at Virginia Tech   **Jan 2024 — Present**

- Organizing Stack@CS Reading Group meetings with Dr. Na Meng, and Dr. Chris Brown
- Recruiting speakers, and organizing talks in the areas of Software Engineering, Software Security, and Systems research

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