Samiha Shimmi

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Google Scholar

Ph.D. candidate in Computer Science at Northern Illinois University, specializing in software engineering with applications in software security, software vulnerability detection, attack-defense co-evolution, and software testing. Actively seeking research positions starting Summer 2026.

Education

2021–present **Northern Illinois University, USA**, *Ph.D. in Computer Science*, CGPA: 3.975

Advisor: Dr. Mona Rahimi

Dissertation topic: Predicting future cyber attacks in software by identifying attack-defense co-evolution patterns

Dissertation summary: This research focuses on how security vulnerabilities and their fixes co-evolve over time, particularly on the unintended reintroduction of vulnerabilities during the fixing process. By analyzing open-source software repositories, it identifies vulnerability-reintroducing patterns across semantic, syntactic, and contextual dimensions of code changes, and develops techniques to predict future vulnerabilities based on the risky fix patterns discovered. This work integrates deep learning, machine learning, large language models (LLMs), and a range of software engineering techniques in the application domain of software security to enable more effective and proactive vulnerability prediction solution.

2017–2019 **Florida State University, USA**, *MS*, Computer Science, CGPA:3.75

2004–2009 **University of Dhaka, Bangladesh**, *B.Sc. (Hons)*, Computer Science & Engineering

Research Experience

Summer 2025 **Argonne National Laboratory**, *Research Aide Technical (Summer Intern)*

2021–present **Northern Illinois University, USA**, *Graduate Research Assistant, Reliable AI-enabled Software Engineering Laboratory (RAISE)*

2018–2019 **Florida State University, USA**, *Graduate Research Assistant, E-Crime Investigative Technologies Laboratory (ECIT)*

Publications

1 **Samiha Shimmi**, Hamed Okhravi, Mona Rahimi, *AI-Based Software Vulnerability Detection: A Systematic Literature Review.* arXiv preprint arXiv:2506.10280, 2025. [arXiv:2506.10280].

2 Hibah Mohammed Ghouse, **Samiha Shimmi**, Mona Rahimi, *Enhanced Detection of Code Vulnerability with Synergy Between Data-Driven, Rule-Based, and Unsupervised Learnings.* 6th edition of the International Workshop on Engineering and Cybersecurity of Critical Systems (EnCyCriS) @ ICSE 2025.

3 **Samiha Shimmi**, Yash Saini, Mark Schaefer, Hamed Okhravi, Mona Rahimi, *Software Vulnerability Detection Using LLM: Does Additional Information Help?* Workshop on AI for Cyber Threat Intelligence, (WAITI 2024), @ ACSAC 2024.

4 **Samiha Shimmi**, Ashiqur Rahman, Mohan Gadde, Hamed Okhravi, Mona Rahimi, *VulSim: Leveraging similarity of Multi-Dimensional neighbor embeddings for vulnerability detection.* 33rd USENIX Security Symposium, (USENIX 2024).

5 **Samiha Shimmi**, Mona Rahimi, *On Association of Code Change Types and CI Build Failures in Software Repositories.* European Journal of Information Technologies and Computer Science, (Ej-Compute 2024).

6 **Samiha Shimmi**, Mona Rahimi, *Software Repositories for Patternizing Attack-and-Defense Co-Evolution.* MSR4P&S,1st International Workshop @ ESEC/FSE 2022.

7 **Samiha Shimmi**, Mona Rahimi, *Leveraging Code-Test Co-evolution Patterns for Automated Test Case Recommendation* 3rd ACM/IEEE International Conference on Automation of Software Test (AST 2022).

8 **Samiha Shimmi**, Mona Rahimi, *Patterns of Code-to-Test Coevolution for Automated Test Suite Maintenance* IEEE International Conference on Software Testing (ICST 2022).

9 **Samiha S. Shimmi**, Gokila Dorai, Umit Karabiyik, Sudhir Aggarwal, *Analysis of iOS SQLite Schema Evolution for Updating Forensic Data Extraction Tools* International Symposium on Digital Forensics and Security (ISDFS 2020).

Research Posters

2025 *Process-Based Predictors of Vulnerability Re-Introductions. Super Computing, St. Louis (SC25)*

2025 *Predicting Future Cyber Attacks in Software by Identifying Attack-Defense Co-evolution Patterns. ALCF student poster session (ALCF, Argonne)*

2024 *VulSim: Leveraging similarity of Multi-Dimensional neighbor embeddings for vulnerability detection. Greater Chicago Area Systems Research Workshop (GCASR 2024)*

Teaching Experience

2021 **Northern Illinois University, USA**, *Graduate Teaching Assistant*

2020 **Ahsanullah University of Science & Technology, Bangladesh**, *Lecturer*

2017–2018 **Florida State University, USA**, *Graduate Teaching Assistant*

Professional Experience

2010–2017 **BASIC Bank Limited, Bangladesh, ICT Division**, *Software Engineer*

Talks

2025 *From Detection to Prediction: Multi-Dimensional Embedding Similarity for Software Security*, CS seminar series, Mathematics and Computer Science division, Argonne National Laboratory, Lemont, IL, USA

2024 *Software Vulnerability Detection Using LLM: Does Additional Information Help?*, Workshop on AI for Cyber Threat Intelligence (WAITI 2024), Hawaii, USA (presented online)

2024 *VulSim: Leveraging similarity of Multi-Dimensional neighbor embeddings for vulnerability detection*, 33rd USENIX Security Symposium 2024 (USENIX 2024), Philadelphia, PA, USA

2023 *Patterns of Code-to-Test Coevolution for Automated Test Suite Maintenance*, IEEE International Conference on Software Testing (ICST 2023), Dublin, Ireland

2022 *Software Repositories for Patternizing Attack-and-Defense Co-Evolution.*, MSR4P&S,1st International Workshop (ESEC/FSE 2022), Singapore (presented online)

2022 *Patterns of Code-to-Test Coevolution for Automated Test Suite Maintenance*, IEEE International Conference on Software Testing (ICST 2022), Online

2020 *Analysis of iOS SQLite Schema Evolution for Updating Forensic Data Extraction Tools* International Symposium on Digital Forensics and Security (ISDFS 2020), (presented online)

Awards

2025 **Trudy Nicholls Graduate Scholarship in Computer Science** - awarded by the Computer Science department, Northern Illinois University

2022 **Smerge Family Endwnt-Lib Arts Scholarship** - awarded by the grad school, Northern Illinois University

2018 **Travel Grant** - Grad Cohort for Women - CRA-WP Workshop 2018

Program Committee Member

2024 CIKM 2024 conference (long research paper track, short research paper track)

2023 CIKM 2023 conference (demo track)

Student Volunteer

2023 2nd International Conference on AI Engineering Software Engineering for AI (CAIN)

2022 Requirement Engineering Conference (RE)

References

Dr. Mona Rahimi
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MIT Lincoln Laboratory
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Dr. George K. Thiruvathukal
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