Tarannum Shaila Zaman, Ph.D

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Google Scholar: https://scholar.google.com/citations?user=_sVj4u8AAAAJ&hl=en
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RESEARCH GOAL

My research goal is to make software and information systems more autonomous, efficient, reliable, and user-friendly by using *Data Mining, Natural Language Processing, Generative AI* and *Program Analysis* techniques.

RESEARCH INTERESTS

Software Engineering, Data Mining and Machine Learning, Distributed Systems, and Human-Centered Software Systems.

EDUCATION

Doctor of Philosophy, Computer Science, Spring 2022
University of Kentucky, Lexington, Kentucky, USA
Thesis: An Automated Framework to Debug System-Level Concurrency Failures
Advisor: Dr. Tingting Yu (https://tingting-yu.scholar.uconn.edu/)
*Co-Advisor:*Dr. D. Manivannan (https://www.cs.uky.edu/~manivann/)

Master of Science, Computer Science and Engineering, 2014
University of Dhaka, Dhaka, Bangladesh
Thesis: A Single Pass Incremental and Interactive Approach for Web Access Sequential Pattern Mining
Advisor: Dr. Chowdhury Farhan Ahmed and Dr. Samiullah

Bachelor of Science, Computer Science and Engineering, 2011
University of Dhaka, Dhaka, Bangladesh
Thesis: A Single Pass Approach for Web Access Sequential Pattern Mining
Advisor: Dr. Chowdhury Farhan Ahmed

WORK EXPERIENCES

Univeristy of Maryland, Baltimore County, MD, USA Jan. 2025 - Present
https://umbc.edu/
Assistant Professor of Information Systems

SUNY Polytechnic Institute, Utica, NY Aug. 2022 - Dec. 2024
https://sunypoly.edu/
Assistant Professor of Computer & Information Science
Director of the Data and Software (DaRe) Research lab.

University of Kentucky, Lexington, KY Aug. 2015 - May 2022
https://www.cs.uky.edu/

- *Research Assistant*, Software Engineering and Verification Lab (Aug. 2015 - Aug. 2016; Jun. 2018 - May 2020; Aug. 2021 - May 2022)
- *Teaching Assistant*, Department of Computer Science (Aug. 2016 - May 2018; Aug. 2020 - May 2021)

Samsung Research & Development Institute Jul. 2012 - Dec. 2013
https://research.samsung.com/srbd
Software Engineer, Mobile Lab 1, Dhaka, Bangladesh.

Together Initiative Ltd, Dhaka — Dec. 2011 - Jul. 2012
https://www.i2gether.com/
Junior Software Engineer

Structured Data Systems Limited (SDSL) — Sep. 2011 - Dec. 2011
Software Quality Assurance Engineer

Grants

PI, National Science Foundation, **CRII: SHF:** RepSON: An Automated and User-centered Framework for Reproducing System-level Concurrency Bugs by Analyzing Bug Reports (CCF-2518445); Amount: $175,000. Start date: June 1, 2024.

CO-PI, SUNY Poly Center Grant Program, **Central Proposal Track A:** WINGS: Wireless and Intelligent Next Generation Systems; Amount: $250,000. Start Date: July 1, 2024.

AWARDS AND HONORS

Dean's Excellence Award, Research, 2024, College of Engineering, SUNY Polytechnic Institute.

Recognized as an inspiring person, 2023, Women Who Inspire Luncheon, SUNY Polytechnic Institute.

Verizon Fellowship in Computer Science, 2021, Department of Computer Science, University of Kentucky.

GSACS Leadership Award, 2021, Graduate Student Association of Computer Science, University of Kentucky.

Pillar Award for Financial Stability, 2021, Graduate Student Congress, University of Kentucky.(https://www.uky.edu/gsc/)

Pillar Award for Belonging and Engagement, 2020, Graduate Student Congress, University of Kentucky.

Grad School Fellowship, 2018 -2019, Department of Computer Science, University of Kentucky.

NSF Travel Grant, Automated Software Engineering (ASE 2019) (https://2019.ase-conferences.org/)

Department's Spotlight, Department of Computer Science, University of Kentucky (http://engr.uky.edu/spotlights/student/shaila-zaman)

Grace Hopper Student Scholarship, 2018 (https://ghc.anitab.org/)

Grad Cohort CRA-W Student Scholarship, 2017 (https://cra.org/)

SIGSOFT Travel Grant, ACM SIGSOFT, Foundations of Software Engineering (FSE 2017) (http://esec-fse17.uni-paderborn.de/)

Lifetime Membership Award, 2017, Holy Cross Debating Club, Holy Cross College, Dhaka, Bangladesh.

Award of Excellence in Secondary School Certificate Exam (2005) and Higher Secondary Certificate Exam (2007), *Education Ministry of Bangladesh.*

Divisional Champion, Language Fest 2005, Bangladesh.

Champion and Best Speaker, 4th Inter University Debate Competition (2011), Bangladesh.

Champion in Group Debate on behalf of University of Dhaka and **Best Speaker** of the Tournament, *Notre Dame College 20th Debate Competition* (2008), Dhaka.

Bangla Extempore Speech Champion, 2005, Rehab Fair (National Level, Bangladesh).

PUBLICATIONS

[1] **Tarannum Shaila Zaman**, Macharla Hemanth Kishan, and Lutfun Nahar Lota. "Gender Dynamics in Software Engineering: Insights from Research on Concurrency Bug Reproduction." In SoutheastCon 2025 IEEE, 2025.

[**2**] Md Sifat Hossain, Anika Tabassum, Md Fahim Arefin, and **Tarannum Shaila Zaman**. "LLM-ProS: Analyzing Large Language Models' Performance in Competitive Problem Solving." In 2025 IEEE/ACM Second International Workshop on Large Language Models for Code, Co-Located with ICSE 2025.

[**3**] Shireesh Reddy Pyreddy, and **Tarannum Shaila Zaman**. "EmoXpt: Analyzing Emotional Variances in Human Comments and LLM-Generated Responses." In 2025 IEEE 15th Annual Computing and Communication Workshop and Conference (CCWC). IEEE, 2025.

[**4**] Tahrim Hossain, Faisal Haque Bappy, **Tarannum Shaila Zaman**, and Tariqul Islam. "SEAM: A Secure Automated and Maintainable Smart Contract Upgrade Framework." In 2025 IEEE 22nd Consumer Communications & Networking Conference (CCNC). IEEE, 2025.

[**5**] Faisal Haque Bappy, **Tarannum Shaila Zaman**, Md Sajidul Islam Sajid, Mir Mehedi Ahsan Pritom, and Tariqul Islam. "Maximizing Blockchain Performance: Mitigating Conflicting Transactions through Parallelism and Dependency Management." In 7th IEEE International Conference on Blockchain, Blockchain 2024, pp. 140-147.**(h5-index: 42**)

[**6**] Mahmoud M. Badr, Mohamed Baza, Amar Rasheed, Hisham Kholidy, Sherif Abdelfattah, and **Tarannum Shaila Zaman**, "Comparative Analysis between Supervised and Anomaly Detectors Against Electricity Theft Zero-Day Attacks." In 2024 International Telecommunications Conference (ITC-Egypt), pp. 706-711. IEEE, 2024.

[**7**] Tariqul Islam, Faisal Haque Bappy, **Tarannum Shaila Zaman**, Md Sajidul Islam Sajid, Mir Mehedi Ahsan Pritom, " MRL-PoS: A Multi-Agent Reinforcement Learning Based Proof of Stake Consensus Algorithm for Blockchain", 2024 IEEE 14th Annual Computing and Communication Workshop and Conference (CCWC), 6–9 January 2024, Las Vegas, NV, USA. **(h5-index: 38**)

[**8**] Faisal Haque Bappy, Tariqul Islam, **Tarannum Shaila Zaman**, Md Sajidul Islam Sajid, and Mir Mehedi Ahsan Pritom, "ConChain: A Scheme for Contention-free and Attack Resilient BlockChain", IEEE Consumer Communications & Networking Conference, 6–9 January 2024, Las Vegas, NV, USA. **(h5-index: 33**)

[**9**] Sabbir Ahmed, Md Nahiduzzaman, Tariqul Islam, Faisal Haque Bappy, **Tarannum Shaila Zaman**, and Raiful Hasan, "FASTEN: Towards a FAult-tolerant and STorage EfficieNt Cloud: Balancing Between Replication and Deduplication", IEEE Consumer Communications & Networking Conference, 6–9 January 2024, Las Vegas, NV, USA. **(h5-index: 33**)

[**10**] Faisal Haque Bappy, Tariqul Islam, **Tarannum Shaila Zaman**, Raiful Hasan, and Carlos Caicedo, "A Deep Dive into the Google Cluster Workload Traces: Analyzing the Application Failure Characteristics and User Behaviors", IEEE The 10th International Conference on Future Internet of Things and Cloud (FiCloud 2023), Marrakesh, Morocco, August 2023. **(h5-index: 21**)

[**11**] Gowtham Reddy Sathi, Lokesh Vedullapalli, Macharla Hemanth Kishan, **Tarannum Shaila Zaman**, Md Tariqul Islam, and Mahmoud M. Badr, 2023 14th International Conference on Computing Communication and Networking Technologies (IC-

CCNT), Delhi, India, 2023, pp. 1-7. **(h5-index: 30)**

[**12**] **Tarannum Shaila Zaman**, Tariqul Islam, Sucharan Reddy Vadla and Uday Kiran Rangu, "WasteMiner: An Efficient Waste Collection System for Smart Cities Leveraging IoT and Data Mining Technique", IEEE SoutheastCon 2023, Orlando, FL, USA, 2023, pp. 504-510. **(h5-index: 20)**

[**13**] Mirza Kamrul Bashar Shuhan, Rupasree Dey, Sourav Saha, Md Shafa Ul Anjum, and **Tarannum Shaila Zaman**, "A Stylometric Dataset for Bengali Poems", 2022, In Proceedings of 6th International Conference on Natural Language Processing and Information Retrieval (NLPIR '22), ACM, New York, NY, USA. **(h5-index: 9)**

[**14**] **Tarannum Shaila Zaman** and Tariqul Islam."ReDPro: An Automated Technique to Detect and Regenerate Process-level Concurrency Failures." In 2022 ACM Southeast Conference (ACMSE 2022), April 18–20, 2022, Virtual Event, USA. ACM, New York, NY, USA, 7 pages. (**acceptance rate: 35**%, **h5-index: 15**)

[**15**] **Tarannum Shaila Zaman**, Xue Han and Tingting Yu, "SCMiner: Localizing System-Level Concurrency Faults from Large System Call Traces," 2019 *34th IEEE/ACM International Conference on Automated Software Engineering (ASE)*, San Diego, CA, USA, 2019, pp. 515-526. (**acceptance rate: 20.4**%, **h5-index: 50**)

[**16**] **Tarannum Shaila Zaman**, Tingting Yu, "Extracting Implicit Programming Rules: Comparing Static and Dynamic Approaches," In *Proceedings of the 7th International Workshop on Software Mining, co-located with ASE,* 2018, pp. 1-7. (**h5-index: 50**)

[**17**] Tingting Yu, **Tarannum Shaila Zaman**, Chao Wang, "DESCRY: Reproducing System-level Concurrency Failures," In *Proceedings of International Symposium on the Foundations of Software Engineering (FSE),* 2017, pp. 694-704. (**acceptance rate: 24.4**%**, h5-index: 57**)

[**18**] Yu Zhao, **Tarannum Shaila Zaman**, Tingting Yu, and Jane Huffman Hayes, "Using Deep Learning to Improve the Accuracy of Requirements to Code Traceability", *Grand Challenges in Traceability (GCT)*, 2017, pp. 22-24.

[**19**] **Tarannum Shaila Zaman**, Nafisah Islam, Chowdhury Farhan Ahmed, Byeong-Soo Jeong, "iWAP: A Single Pass Approach for Web Access Sequential Pattern Mining", *GSTF International Journal on Computing* Vol. 2, No. 1, April 2012, pp. 62-67. (**h-index: 6**)

TEACHING

University of Maryland, Baltimore County, Baltimore, Maryland, USA

IS 636/Hcc 636−Structured System Analysis and Design(Spring 2025)

SUNY Polytechnic Institute, Utica, New York, USA

CS 512−Software Engineering(Spring 2024, Fall 2024)
CS 518−Software Testing(Fall 2024)
CS 541−Database Systems(Spring 2024)
CS 350−Information & Knowledge Management (Fall 2022, Spring 2023, and Fall 2023)
CS 518−Data Mining in Software Engineering (Fall 2022)
CS 548−Applied Data Science (Spring 2023)
CS 518−Empirical Software Engineering (Fall 2023)

University of Kentucky, Lexington, Kentucky, USA

CS 216−Introduction to Software Engineering (Fall 2020 and Spring 2021)
CS 215− Introduction to Program Design, Abstraction and Problem Solving (C++ Programming) (Fall 2018 and Spring 2019)
CS 221 − First Course in Computer Science for Engineers (Matlab Programming) (Fall 2016 and Spring 2017)
CS 585/685 − Advanced Software Engineering (Spring 2020)
CS 498 − Software Engineering for Senior Project (Fall 2019)

Holy Cross Girls High School & **College**, Dhaka, Bangladesh

Mathematics (Fall 2009 and Fall 2010)
Chemistry (Spring 2010)

RESEARCH PROJECTS

Current Projects:

- **Identifying Current Trends and Future Scopes Automatically from Scientific Manuscripts Leveraging Natural Language Processing:** We are developing an approach to identify the future scopes or challenges from scientific manuscripts on the software engineering field by using Natural Language Processing and Machine Learning techniques.
- **User Interactive Debugging by Using NLP and Data Mining Technique:** Many Automated debugging techniques are developed and proposed by researchers. However, there is no research on the real-world usage of these techniques. To develop a user-friendly debugging technique, we set up research questions for developers. The answers will guide the path to developing a user-interactive debugging technique.
- **Automatically Reproducing System-Level Concurrency Bugs from Bug Reports:** We develop an approach that combines natural language processing, data mining, and structured information retrieval to automatically reproduce bugs from bug reports that are written in natural language.[**This work will be supported by my recent NSF CRII grant.**]

Past Projects:

- **Automated Reproduction of System-Level Concurrency Bugs by Using the Default Console Logs:** To develop an automated bug reproduction technique just by using the default console logs of an application, we use a combination of static and dynamic analysis techniques, together with symbolic execution. [**This work is supported in part by NSF grants CCF-1464032, CNS-1405697, and CCF-1722710**]
- **Extracting Hidden Program Rules:** Programs often follow implicit programming rules, such as function call 'A' must be followed by function call 'B'. The Data Mining technique is used to extract this kind of rule. [**This research is supported in part by the NSF grant CCF-1652149**]
- **Single Pass Approach Web Access Sequential Pattern Mining:** We developed an algorithm, that improved Web Access Pattern (iWAP) mining, to find web access patterns from weblogs more efficiently than the WAP-mine algorithm. This technique is an incremental and interactive mining technique.

INDUSTRY EXPERIENCES

Samsung R&D Institute Bangladesh, Dhaka (Jul. 2012 - Dec. 2013)

- Worked as a *Software Engineer*; my responsibility was implementing new features and fixing bugs in the *IM (Instant Messenger)* and *ChatOn* application of all Samsung Devices.

- Participated in the *Software Capability Test* which was held simultaneously in all overseas R&D Institutes of Samsung Electronics and was ranked in the top 9 percent.
- Attended training on *Object Oriented Programming and Java SHP (Samsung Handset Platform)* at *SISO (Samsung India Software Operations, Bangalore)*

Together Initiative Ltd, Dhaka (Dec. 2011 - Jul. 2012)

- Worked as a *Junior Software Engineer*; my responsibility was developing a *School Management System* software which was web based (JSP) and MySQL database supported.

Structured Data Systems Limited (SDSL) (Sep. 2011 - Dec. 2011)

- Worked as a *Software Quality Assurance Engineer*; my responsibility was testing the *AfriGIS* navigator and *AfriGIS* maps project (https://www.afrigis.co.za/) with automated tool.

TALKS

Conferences & ***Workshops:***

Engineering Week 2024, SUNY Polytechnic Institute, Panelist in the *Panel Discussion: Stem Education in Mother Language.*

IEEE Consumer Communications and Networking Conference (CCNC), 2024, Las Vegas, Nevada, Presented our poster, *"ConChain: A Scheme for Contention-free and Attack Resilient BlockChain".*

Research Seminar, IUT, 2023, Gazipur, Bangladesh: On of the speakers in the *"Exploring Research Collaboration".*

2023 IEEE Southeast Conference, Orlando, Fl, Presented our accepted research paper, *"WasteMiner: An Efficient Waste Collection System for Smart Cities Leveraging IoT and Data Mining Technique".*

2022 Ada Lovelace Celebration, Dhaka, Bangladesh: One of the speakers in the *"Challenges and Opportunities for Women in Computing".*

2022 The ACM Southeast (ACMSE) conference, (Online): Presented our accepted research paper, *"ReDPro: An Automated Technique to Detect and Regenerate Process-level Concurrency Failures."*

2021 NAGPS (National Association of Graduate and Professional Students) Midwestern Regional Conference,(Online): Was a panelist in the panel of international graduate and professional students.

2020 Ada Lovelace Celebration, Dhaka, Bangladesh: One of the speakers in the *"Ask me anything about Higher Studies."* session.

IEEE/ACM International Conference on Automated Software Engineering (ASE 2019), San Diego, USA: Presented our accepted research paper, *"SCMiner: Localizing System-Level Concurrency Faults from Large System Call Traces".*

Summer Research Conference 2019, University of Kentucky, Lexington, USA: Presented one of our research works, *Reproducing System-level Concurrency Failures from Bug Reports.*

7th International Workshop on Software Mining, co-located with ASE, 2018, Montpellier, France: Presented our accepted research work, *"Extracting Implicit Programming Rules: Comparing Static and Dynamic Approaches."*

Grand Challenges in Traceability (GCT), 2017, Kentucky, USA: Presented one

of our research ideas, *"Using Deep Learning to Improve the Accuracy of Requirements to Code Traceability"*

International Symposium on the Foundations of Software Engineering (FSE), 2017, Paderbon, Germany: Presented our accepted research paper, *"DESCRY: Reproducing System-Level Concurrency Failures"*

Keeping Current Seminar, University of Kentucky:

- Localizing System-Level Concurrency Faults from Large System Call Traces, Fall 2019.
- Experiences from Grace Hopper Conference, Spring 2019.
- Extracting Implicit Programming Rules, Fall 2018.
- How to use Data-mining Tools?, Fall 2017.
- Reproducing concurrent bugs by manipulating process interleaving, Spring 2017.
- How to write a Pintool?, Fall 2016.

EXTERNAL REVIEW

TPC Reviewer at *IEEE SoutheastCon 2025*
Reviewer and Panel member in three different programs of *NSF 2025*
Reviewer at *IEEE TRANSACTIONS ON KNOWLEDGE AND DATA ENGINEERING, 2025*
TPC Reviewer at *IEEE SoutheastCon 2024*
Technical Program Committee Member at *Next Generation in Communication, Computer and Network Systems 2023 Virtual Conference (ComNetSys2023)*
Reviewer at *2022 International Conference on Computer Science and Software Engineering CSASE*
Sub-reviewer at *The Annual ACM Southeast Conference*, 2020
Sub-reviewer at *Journal of Software: Evolution and Process*

PROFESSIONAL SKILLS

Programming Languages: Python, R, C, C++, Java, JavaScript, Matlab.

Database: MySQL, Oracle, MS SQL Server.

Web Development: PHP, HTML5, CSS.

Tools/IDE: Microsoft Visual Studio, NetBeans, Eclipse, Turbo C++, OpenMP, RStudio, Tasm, Masm, Klee, Pin, Codesurfer, SrcML.

Simulation Softwares: Dsch3, Microwind (version 9.2), WEKA.

Operating Systems: Unix/Linux, Windows.

ACTIVITIES AND SERVICES

Faculty Senate Member, *College of Engineering*, SUNY Polytechnic Institute, (2023−Present).

Committee Member, *Graduate Council*, SUNY Polytechnic Institute, (2022−Present).

Search Committee member for faculty search, *Department of Computer and Information Science*, SUNY Polytechnic Institute, (2023).

President, *Graduate Student Association of Computer Science*, University of Kentucky, (2020−2021).

Treasurer, *Graduate Student Congress (GSC)*, University of Kentucky, (2020−2021).

Student Volunteer, *IEEE/ACM International Conference on Automated Software Engineering (ASE)*, (2019).

Student Volunteer, *International Symposium on the Foundations of Software Engineering (FSE)*, (2017).

Volunteer Instructor, *Hour of Code*, Department of Computer Science, University of Kentucky, (2017, 2018).

Student Volunteer, *Engineering Day (E-day)*, University of Kentucky (2018, 2019).

Department Representative of *Graduate Student Congress (GSC)*, (2019-2021).

Cultural Secretary, *Bangladesh Student Association*, University of Kentucky, (2017-2019).

President, *Computer Science & Engineering Debating Club*, University of Dhaka, Bangladesh (2010).

Executive Member, *Computer Science & Engineering Science Club*, University of Dhaka (2010).

Secretary, *Computer Science & Engineering Debating Club*, University of Dhaka, Bangladesh (2009).

Editor, *The Official Magazine of Holy Cross College*, Dhaka, Bangladesh (2005-2006).

Secretary, *Holy Cross Debating Club*, Dhaka, Bangladesh (2003).

References

Dr. Tingting Yu (https://tingting-yu.scholar.uconn.edu/)
Associate Professor
Dept. of Computer Science and Engineering, University of Connecticut
Storrs, CT 06269-4155, USA
Email: tingting.yu@uconn.edu ; Phone: (859) 257-6745

Dr. D. Manivannan (https://www.cs.uky.edu/~manivann/)
Associate Professor
Dept. of Computer Science, University of Kentucky
301 Rose Street, Lexington, KY 40508-3026
E-Mail: manivann@cs.uky.edu ; Phone: (859) 257-9234

Dr. Zongming Fei (https://www.cs.uky.edu/~fei/)
Professor; Department Chair
Dept. of Computer Science, University of Kentucky
301 Rose Street, Lexington, KY 40508-3026
E-Mail: fei@cs.uky.edu ; Phone: 859-257-3202