

Tarannum Shaila Zaman

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OBJECTIVE	I am actively searching for a <i>Tenure-Track Assistant Professor</i> position in the field of <i>Software Engineering and Information Systems</i> . My research goal is to make the computer systems more autonomous, efficient, reliable, and user friendly by using <i>Data Mining, Natural Language Processing</i> , and <i>Program Analysis</i> techniques.	
RESEARCH INTERESTS	Automated Software Systems, Data Mining and Knowledge Discovery, Natural Language Processing, Information Retrieval, and User-Software Interaction.	
TEACHING INTERESTS	Software Engineering, Application Programming, Data Mining, Data Science, Database Management, Computer Networking, and Information Security.	
EDUCATION	<p><i>Doctor of Philosophy</i>, Computer Science (Tentative Graduation: Spring '2022) University of Kentucky, Lexington, Kentucky, USA <i>Thesis</i>: Towards an Automated Debugging System for Concurrent Applications <i>Advisor</i>: Dr. Tingting Yu (https://homepages.uc.edu/~tyu/)</p> <p><i>Master of Science</i>, Computer Science and Engineering, 2014 University of Dhaka, Dhaka, Bangladesh <i>Thesis</i>: A Single Pass Incremental and Interactive Approach for Web Access Sequential Pattern Mining <i>Advisor</i>: Dr. Chowdhury Farhan Ahmed and Dr. Samiullah</p> <p><i>Bachelor of Science</i>, Computer Science and Engineering, 2011 University of Dhaka, Dhaka, Bangladesh <i>Thesis</i>: A Single Pass Approach for Web Access Sequential Pattern Mining <i>Advisor</i>: Dr. Chowdhury Farhan Ahmed</p>	
WORK EXPERIENCES	<p>University of Kentucky, Lexington, KY https://www.cs.uky.edu/</p> <ul style="list-style-type: none">• <i>Research Assistant</i>, Software Engineering and Verification Lab (Aug. 2015 - Aug. 2016; Jun. 2018 - May 2020; Aug. 2021 - Present)• <i>Teaching Assistant</i>, Department of Computer Science (Aug. 2016 - May 2018; Aug. 2020 - May 2021) <p>Samsung R & D Institute Bangladesh, Dhaka https://research.samsung.com/srbd <i>Software Engineer</i>, Mobile Lab 1.</p> <p>Together Initiative Ltd, Dhaka https://www.i2gether.com/ <i>Junior Software Engineer</i></p>	<p>Aug. 2015 - Present</p> <p>Jul. 2012 - Dec. 2013</p> <p>Dec. 2011 - Jul. 2012</p>

**AWARDS
AND
HONORS**

Verizon Fellowship in Computer Science, Department of Computer Science, University of Kentucky (2021)

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, Department of Computer Science, University of Kentucky (2018 - 2019)

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, Holy Cross Debating Club, Holy Cross College, 2017

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, Rehab Fair (National Level).

- PUBLICATIONS**
- [1] **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: 45**)
 - [2] **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: 45**)
 - [3] 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**)

[4] 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.

[5] **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**)

PAPERS UNDER REVIEW

[1] **Tarannum Shaila Zaman**, and Tingting Yu “ResCon: Reproducing System-level Concurrency Bugs from Bug Reports”, In *Proceedings of The 44th International Conference on Software Engineering (ICSE 2022)*. ACM, New York, NY, USA.

[2] **Tarannum Shaila Zaman**, “ReDPro: An Automated Technique to Detect and Regenerate Process-Level Concurrency Failures”, In *2022 ACM Southeast Conference (ACMSE 2022)*, April 18–20, 2022, Oxford, AL, USA. ACM, New York, NY, USA.

[3] **Tarannum Shaila Zaman**, “Towards an User-Interactive Debugging Technique”, In *2022 ACM Southeast Conference (ACMSE 2022)*, April 18–20, 2022, Oxford, AL, USA. ACM, New York, NY, USA.

PAPERS IN PREPARATION

[1] **Tarannum Shaila Zaman**, and Tingting Yu “SCMinerPlus: Debugging System-Level Concurrency Faults from Large System Call Traces”.

[2] **Tarannum Shaila Zaman**, and Tingting Yu “Recent Trends and Challenges in Debugging Concurrency Faults”.

TEACHING

University of Kentucky, Lexington, Kentucky, USA

CS 216—Introduction to Software Engineering (Fall 2020 and Spring 2021): I worked as a Teaching Assistant in this course where I introduced the students to the basics of Software Engineering and the Unix platform. I also taught them the implementation of large programming projects using object-oriented design techniques.

CS 215— Introduction to Program Design, Abstraction and Problem Solving (C++ Programming) (Fall 2018 and Spring 2019): I worked as a Teaching Assistant in this course and taught fundamental elements of data structures and algorithm design.

CS 221 – First Course in Computer Science for Engineers (Matlab Programming) (Fall 2016 and Spring 2017): I worked as a Teaching Assistant for this course and taught basic programming concept by solving engineering problems with Matlab.

CS 585/685 – Advanced Software Engineering (Spring 2020): I worked as a Part Time Instructor for this course and helped my advisor prepare lecture notes and teach.

CS 498 – Software Engineering for Senior Project (Fall 2019): I worked as a Part Time Instructor for this course and helped the course instructor prepare lecture notes and teach.

Holy Cross Girls High School & College, Dhaka, Bangladesh

Mathematics (Fall 2009 and Fall 2010): I worked as a Part Time Instructor of the math class for the high school kids. I taught them algebra and geometry.

Chemistry (Spring 2010): I worked as a Part Time Instructor of the chemistry class for the high school kids. I taught them organic and inorganic chemistry.

RESEARCH PROJECTS

Current Projects:

- **Towards an User Interactive Debugging 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 an user friendly debugging technique, we set up research questions for developers. The answers will guide the path to develop an 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 which are written in natural language.
- **Automated Reproduction of System-Level Concurrency Bugs by Using the Default Console Logs:** To develop 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]
- **Automated Localization of System-level Concurrency Bugs:** Data mining and statistical anomaly detection techniques are used to identify the failure inducing system call sequences. It then maps each abnormal sequence to specific application functions in the source code. [This research is supported in part by the NSF grant CCF-1652149]

Past Projects:

- **Extracting Hidden Program Rules:** Programs often follow implicit programming rules, such as, function call 'A' must be followed by function call 'B'. Data Mining technique is used to extract this kind of rules. [This research is supported in part by the NSF grant CCF-1652149]
- **Single Pass Approach for Web Access Sequential Pattern Mining:** We developed an algorithm, improved Web Access Pattern (iWAP) mining, to find web access patterns from web logs 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:

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.

RELEVANT COURSES [COMPLETED]

Algorithm Design, Distributed Operating Systems, Software Testing and Quality Evaluation, Intermediate Topics in Database Systems, Advanced Data Science, Empirical Software Engineering, Data Mining, Object-Oriented Programming, Computer Networking, Cryptography and Security.

EXTERNAL REVIEW

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

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://homepages.uc.edu/~tyu/>)

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