Shanto Rahman

Ph.D. Student in Electrical and Computer Engineering
The University of Texas at Austin
Cockrell School of Engineering
U.S. Permanent Resident (EB-2)

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Research Interests

My research interests are in **Software Engineering**, with a focus on **Software Testing**. I design methods and tools that make modern **software reliable** at scale. By combining **program analysis** with **machine learning**, I predict, reproduce, and repair hard-to-diagnose test failures-moving toward self-healing software and faster, safer releases.

Education

Ph.D, Software Engineering and Systems Aug. 2021–Present
Electrical and Computer Engineering, University of Texas at Austin (UT Austin)

Master of Science in Software Engineering Jan. 2015–Jul. 2016
Institute of Information Technology (IIT), University of Dhaka (DU)

Bachelor of Science in Software Engineering Jan. 2011–Dec. 2014
Institute of Information Technology (IIT), University of Dhaka (DU)

Professional Experience

Research Intern, Google May. 2025–Aug. 2025

– Worked on Changelist (CL) culprit prediction

Applied Scientist Intern, Amazon Web Services (AWS) May. 2024–Sept. 2024

– Worked on change aware unit test repair using LLM (Published in OOPSLA 2025)

Lecturer, Bangladesh University of Professionals (BUP) Sept. 2017–Jan. 2021

– Teaching SE Courses • Conducting SE Research, • Designing Curriculum and Course Materials

Senior Software Engineer, Samsung Research, Bangladesh Jul. 2016–Jul. 2017

– Android and Tizen app development using Java, MySQl, Git, PHP, MAP API, Google API

Software Engineer Intern, Orion Informatics Ltd. Jan. 2014–Aug. 2014

– Worked on a project namely Browser Based Editing (BBE)

Publications

My publications include top-tier software engineering conferences such as **ICSE**, **ASE**, **OOPSLA** and **ICST**.

20. **Shanto Rahman**, Saikat Dutta, August Shi, "Understanding and Improving Flaky Test Classification", In Object-oriented Programming, Systems, Languages, and Applications, (OOPSLA), Singapore, 2025. **Artifact Award
19. **Shanto Rahman**, Sachit Kuhar, Berk Cirisci, Pranav Garg, Shiqi Wang, Xiaofei Ma, Anoop Deoras, Baishakhi Ray, "UTFix: Change Aware Unit Test Repairing using LLM", In Object-oriented Programming, Systems, Languages, and Applications, (OOPSLA), Singapore, 2025. **Adopted by AWS
18. **Shanto Rahman**, Bala Naren Chanumolu, Suzzana Rafi, August Shi, and Wing Lam. "Ranking Relevant Tests for Order-Dependent Flaky Tests", In International Conference on Software Engineering (ICSE), Ottawa, Canada, 2025. acceptance-rate: 21%.

17. Talank Baral, Emirhan Oğul, **Shanto Rahman**, August Shi, and Wing Lam. "OptCD: Optimizing Continuous Development", In International Conference on Software Engineering (ICSE-Demo), Ottawa, Canada, 2025

16. **Shanto Rahman**, Abdelrahman Baz, Sasa Misailovic and August Shi. "Quantizing Large-Language Models for Predicting Flaky Tests", In International Conference on Software Testing, Verification and Validation (ICST), Toronto, Canada, May 2024. acceptance-rate: 25%.

15. **Shanto Rahman**, Aaron Massey, Wing Lam, August Shi and Jonathan Bell. "Automatically Reproducing Timing-Dependent Flaky-Test Failures", In International Conference on Software Testing, Verification and Validation (ICST), Toronto, Canada, May 2024. acceptance-rate: 25%.

14. **Shanto Rahman**, and August Shi. "FlakeSync: Automatically Repairing Async Flaky Tests", In International Conference on Software Engineering (ICSE), Lisbon, Portugal, April 2024. acceptance-rate: 25%. **Artifact Award

13. Talank Baral, **Shanto Rahman**, Bala Naren Chanumolu, Basak Balci, Tuna Tuncer, August Shi, and Wing Lam. "Optimizing Continuous Development By Detecting and Preventing Unnecessary Content Generation", In Proceedings of the 38th Annual International Conference on Automated Software Engineering (ASE), Kirchberg, Luxembourg, 2023.

12. **Shanto Rahman**, Chengpeng Li, and August Shi. "TSVD4J: Thread-Safety Violation Detection for Java, In International Conference on Software Engineering", (ICSEDemo), Melbourne, Australia, May 2023.

11. Nazneen Akhter, **Shanto Rahman**, and Kazi Abu Taher. "An Anti-Pattern Detection Technique Using Machine Learning to Improve Code Quality". *In International Conference on Information and Communication Technology for Sustainable Development (ICICT4SD)*, Dhaka, Bangladesh, December, 2021.

10. **Shanto Rahman**, Md Mostafijur Rahman, and Kazi Sakib, "A Statement Level Bug Localization Technique using Statement Dependency Graph". In 12th International Conference on Evaluation of Novel Approaches to Software Engineering (ENASE), Porto, Portugal, April, 2017.

9. **Shanto Rahman** and Kazi Sakib. "An Appropriate Method Ranking Approach for Localizing Bugs using Minimized Search Space". In International Conference on Evaluation of Novel Approaches to Software Engineering (ENASE), Rome, Italy, April, 2016.

8. Md Mostafijur Rahman, **Shanto Rahman**, Minhas Kamal, M. Abdullah-Al-Wadud, Emon Kumar Dey, and Mohammad Shoyaib. "Noise adaptive binary pattern for face image analysis". In International Conference on Computer and Information Technology (ICCIT), Dhaka, Bangladesh, 2015. **Best Paper Award

7. SM Sofiqul Islam, **Shanto Rahman**, Md Mostafijur Rahman, Emon Kumar Dey, and Mohammad Shoyaib. "Application of deep learning to computer vision: A comprehensive study". In International Conference on Informatics, Electronics and Vision (ICIEV), Dhaka, Bangladesh, December, 2016.

6. **Shanto Rahman**, Kishan Kumar Ganguly, and Kazi Sakib. "An improved bug localization using structured information retrieval and version history". In International Conference on Computer and Information Technology (ICCIT), Dhaka, Bangladesh, December, 2015.

5. **Shanto Rahman**, Md Mostafijur Rahman, Khalid Hussain, Shah Mostafa Khaled, and Mohammad Shoyaib. "Image enhancement in spatial domain: A comprehensive study". In International Conference on Computer and Information Technology (ICCIT), Dhaka, Bangladesh, December, 2014.

4. Khalid Hussain, **Shanto Rahman**, Shah Mostofa Khaled, M. Abdullah-Al-Wadud, and Mohammad Shoyaib. "Dark image enhancement by locally transformed histogram". In International Conference on Software, Knowledge, Information Management and Applications (SKIMA), Dhaka, Bangladesh, 2014.

3. Md Mostafijur Rahman, **Shanto Rahman**, and Mohammad Shoyaib. "MCCT: a multi-channel complementary census transform for image classification". Signal, Image and Video Processing 12, no. 2 (2018): 281-289.

2. Md Mostafijur Rahman, **Shanto Rahman**, Rayhanur Rahman, Mainul Hossain, and Mohammad Shoyaib. "DTCTH: a discriminative local pattern descriptor for image classification". EURASIP Journal on Image and Video Processing, no. 1 (2017): 30.

1. **Shanto Rahman**, Md Mostafijur Rahman, M. Abdullah-Al-Wadud, Golam Dastegir Al-Quaderi, and Mohammad Shoyaib. "An adaptive gamma correction for image enhancement". EURASIP Journal on Image and Video Processing, no. 1 (2016): 35. **Adopted by National Institute of Health (NIH)

Awards

- **MIT EECS Rising Stars**, MIT — Oct. 2025
- **Honorably Invited to NextProf Nexus,** UC Berkeley — Sept. 2025
- **SIGSOFT CAPS Student Travel Award for ICSE, ACM SIGSOFT** — 2025
- **Temple Foundation Graduate Fellowship,** UT Austin — 2024-2025
- **Travel Award from IEEECS Technical Committee of Software Engineering (TCSE)** — 2024
- **UT Professional Development Award** — 2023
- **Cockrell School of Engineering Fellowship** - UT Austin — 2021-2022
- **Research Grant**- University Grants Commission (UGC), Bangladesh — 2019-2020
- **Research Grant**- University Grants Commission (UGC), Bangladesh — 2018-2019
- **Research Fellowship**- Ministry of Information and Communication Technology, Bangladesh — 2015-2016
- **Best Paper Award**- International Conf. on Computer and Information Technology (ICCIT), IEEE — Dec. 2015
- **Top Merit Award-Kabi Sufia Kamal Hall,** University of Dhaka, Bangladesh — 2016
- **Merit Scholarship**-Dhaka University Alumni Association — 2015
- **Merit Scholarship**-Mercantile Bank Ltd., Bangladesh — 2011
- **Board Scholarship-Secondary School Certificate (SSC),** Jessore Board, Bangladesh — 2011
- **Merit Scholarship-Class Eight,** Khulna Division, Bangladesh — 2006

Teaching

University of Texas at Austin (UT Austin) — Jan. 2025–May.2025
Teaching Assistant, Department of Electrical and Computer Engineering

- Course: Software Design & Implementation II

Bangladesh University of Professionals (BUP) — Sept. 2017–Jan. 2021
Lecturer, Department of Information and Communication Technology (ICT)

- Taught Courses
  - Software Engineering • Software Testing • Distributed System • Object Oriented Programming
- Supervised undergraduate and graduate student research projects

Services

- **Reviewer**- ACM Transactions on Software Engineering and Methodology (TOSEM) — July, 2025
- **Reviewer**- Transactions on Software Engineering (TSE) — April, 2025
- **PC member**-International Flaky Tests Workshop (FTW), co-located with ICSE — 2025
- **PC member**- Artifact Evaluation, ICSE — 2025
- **Shadow Reviewer**- ICSE, FSE, ASE, ISSTA — 2024, 2025
- **Amazon Campus Brand Ambassador** — 2025
- **Judge**- Capital of Texas Undergraduate Research Conference — 2023
- **Reviewer** - Journal of Information and Software Technology — 2020
- **Committee Member** - Academic Curriculum Review Committee, BUP — 2020
  - Reviewed existing undergrad curriculum for the department of ICT and modified the syllabus based on the recent technology trends.
- **Mentor**, National Hackathon on Frontier Technologies — Jan. 2020 - Feb. 2020

  - Organized by Ministry of Posts, Telecommunications and Information Technology. One of my mentored teams won first place in the waste management category.
- **Moderator**, BUP Infotech Club (BUPITC) Jul. 2019 - Dec. 2020
  - BUPITC is one of the leading clubs of BUP whose main focus is to arrange programming contest, hackathon, idea contest, workshop, and introduce new technologies to the students.
- **House Tutor**, BUP Apr. 2020 - Dec. 2020
  - Student Counselling
- **Student Advisor**, Dept. of Information and Communication Technology (ICT), BUP Jan. 2018 - Dec. 2020
  - Student Progress Monitoring • Student Counselling

Research Advising

- Nandita Jayanthi (MS, UT Austin)
- Bala Naren Chanumolu
  - Co-authored: ICSE'2024
- Emirhan Oğul (BS, GMU)
  - Co-authored: ICSE Demo'2024
- Başak Balcı (MS, TUM)
  - Co-authored ASE'2023
- Tuna Tuncer (MS, TUM)
  - Co-authored ASE'2023
- Nazneen Akhter (MS, BUP)
  - Co-authored ICICT4SD'2021
- Sadia Khan Rupa (BS, BUP)
  - Co-authored ICICT4SD'2021

Notable Open-Source Contributions

- International Dataset of Flaky Tests (IDoFT)
  - IDoFT is a public dataset for flaky-test research. I integrated **170 timing-dependent (TD)** flaky tests and **1,900+ order-dependent (OD) related tests**. IDoFT is available https://github.com/TestingResearchIllinois/idoft (My GitHub ID shanto-rahman)
- TSVD4J
  - We present TSVD4J, a Maven-plugin tool for detecting thread-safety violations in Java applications. TSVD4J integrates into any Maven project and executes the project's test suite, analyzing runtime behavior to surface conflicts. Evaluated on 12 applications, TSVD4J identified **55 conflicting pairs** indicative of thread-safety bugs. Compared to RV-Predict, TSVD4J detects more violations with similar runtime, largely due to its explicit tracking of field accesses. We presented at ICSE Demo'24; Repository: https://github.com/UT-SE-Research/TSVD4J.
- OPTCD
  - OptCD is a technique that dynamically identifies wasted work in CD pipelines by tracing build outputs and flagging unused artifacts. In evaluation, it enabled required changes for **72.0% of unused directories**. Presented at ICSE Demo'24; we submitted 26 GitHub pull requests to upstream projects (e.g., google/open-location-code, junit-team/junit4, JSQLParser/JSqlParser), with **12 accepted**. Our repository is https://github.com/software-research/optCD-demo.
- FlakeSync
  - We present FlakeSync, a technique for automatically repairing async flaky tests by introducing synchronization for a specific test execution. Our evaluation on known flaky tests from a prior dataset shows that FlakeSync can automatically repair 83.75% of the async flaky tests. We presented this paper in ICSE'24. We submitted 10 pull requests based on FlakeSync's patches, with **3 accepted pull requests** and none rejected thus far.

Invited Talks

- Conference Talk
  - Ranking Relevant Tests for Order-Dependent Flaky Tests, ICSE, Ottawa, Canada, 2025
  - Quantizing Large-Language Models for Predicting Flaky Tests, ICST, Toronto, Canada, 2024

  - Automatically Reproducing Timing-Dependent Flaky-Test Failures , ICST, Toronto, Canada, 2024
  - FlakeSync: Automatically Repairing Async Flaky Tests, ICSE, Lisbon, Portugal, 2024
  - TSVD4J: Thread-Safety Violation Detection for Java, ICSE, Melbourne, Australia, 2023
  - Appropriate Method Ranking Approach for Localizing Bugs using Minimized Search Space, ENASE, Rome, Italy, 2016
  - An improved bug localization using structured information retrieval and version history, Dhaka, Bangladesh, 2015
  - Image enhancement in spatial domain: A comprehensive study, Dhaka, Bangladesh, 2014
- Invited Talk
  - MIT EECS Rising Star, October, 2025
  - Google PhD Intern Summit, Google, July, 2025
  - ECE Outstanding Student Lecture Series, UT Austin, February, 2025
  - Reproducing Flaky Tests and its Mitigation, George Mason University, 2024
  - Graduate and Industry Networking (GAIN), Austin, Texas, USA, 2024
  - ECE Outstanding Student Lecture Series, UT Austin 2024
  - Lightening Talk, GWGMC Research Symposium, UT Austin, 2023
- Seminar Talk
  - UTFix: Change Aware Unit Test Repairing using LLM, Columbia University, NYC, USA, August 2025
  - Changelist culprit prediction, Google, Sunnyvale, California, 2025
  - Understanding and Improving Flaky Test Classification, UT Cornell SE Seminar, Austin, TX, USA, 2025
  - UTFix: Change Aware Unit Test Repairing using LLM, UT Cornell SE Seminar, Austin, TX, USA, 2025
  - Flaky Tests Mitigation, Google, Sunnyvale, California, 2025
  - Ranking Relevant Tests for Order-Dependent Flaky Tests, GMU Seminar, Virginia, USA, 2025
  - Ranking Relevant Tests for Order-Dependent Flaky Tests, UT Cornell SE Seminar, Austin, TX, USA, 2025
  - Change Aware Unit Test Repair, Amazon Web Service, NYC, USA, 2024
  - FlakeSync: Automatically Repairing Async Flaky Tests, UT Cornell SE Seminar, Austin, TX, USA, 2024
- Guest Lecture
  - UTFix: Change Aware Unit Test Repairing using LLM, Software Testing in the Era of Nondeterminism (ECE 382V), Graduate Level, Sept. 2025
  - Understanding and Improving Flaky Test Classification, Software Testing in the Era of Nondeterminism (ECE 382V), Graduate Level, Sept. 2025