Austin Mordahl

Ph.D. Candidate

800 W. Campbell Rd.
Richardson, TX 75080
austin.mordahl@utdallas.edu
http://austinmordahl.com

Research Interests

My research interests are in **software engineering** and **program analysis**. I have focused on **transforming software quality assurance (SQA) processes** (such as fuzzing and static analysis) to make them more accurate and accessible. My work has applied approaches like testing, static analysis, and machine learning towards this goal. **For the future, I am interested in developing an ecosystem of intelligent, self-adaptive, and collaborative SQA techniques that will improve the overall quality of software.**

Education

2018–2024 (expected) **Ph.D. in Software Engineering**, The University of Texas at Dallas, Richardson, TX

Advisor Dr. Shiyi Wei

2014–2018 **B.S. in Software Engineering**, The University of Texas at Dallas, Richardson, TX

GPA 4.0/4.0

Honors *Summa cum laude*

Awards

2020 **NSF Graduate Research Fellowship**

2020 Eugene McDermott Graduate Fellowship

2019 Student Research Competition Winner, International Conference on Software Engineering (ICSE)

Publications

Asterisks (*) indicate co-first authors.

Refereed Publications

ICSE '23 **Austin Mordahl**, Zenong Zhang, Dakota Soles, and Shiyi Wei. ECSTATIC: An extensible framework for testing and debugging configurable static analysis. In the IEEE/ACM 45th International Conference on Software Engineering (ICSE), pages 550–562, 2023.

EMSE Sai Yerramreddy*, **Austin Mordahl***, Ugur Koc, Shiyi Wei, Jeffrey S Foster, Marine Carpuat, and Adam A Porter. An empirical assessment of machine learning approaches for triaging reports of static analysis tools. Empirical Software Engineering (EMSE), 28(2):28, 2023.

ISSTA '23 DS **Austin Mordahl**. Automatic testing and benchmarking for configurable static analysis tools. Doctoral Symposium track. In Proceedings of the 32nd ACM SIGSOFT International Symposium on Software Testing and Analysis (ISSTA), pages 1532–1536, 2023.

ISSTA '23 Demo **Austin Mordahl**, Dakota Soles, Miao Miao, Zenong Zhang, and Shiyi Wei. ECSTATIC: Automatic configuration-aware testing and debugging of static analysis tools. Tool demonstration track. In Proceedings of the 32nd ACM SIGSOFT International Symposium on Software Testing and Analysis (ISSTA), pages 1479–1482, 2023.

ISSTA '21 **Austin Mordahl** and Shiyi Wei. The impact of tool configuration spaces on the evaluation of configurable taint analysis for android. In Proceedings of the 30th ACM SIGSOFT International Symposium on Software Testing and Analysis (ISSTA), pages 466–477, 2021.

ASE '21 Ugur Koc, **Austin Mordahl**, Shiyi Wei, Jeffrey S Foster, and Adam A Porter. Satune: a study-driven auto-tuning approach for configurable software verification tools. In the 36th IEEE/ACM International Conference on Automated Software Engineering (ASE), pages 330–342, 2021.

ESEC/FSE '19 **Austin Mordahl**, Jeho Oh, Ugur Koc, Shiyi Wei, and Paul Gazzillo. An empirical study of real- world variability bugs detected by variability-oblivious tools. In Proceedings of the 27th ACM Joint Meeting on European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE), pages 50–61, 2019.

ICSE '19 SRC **Austin Mordahl**. Toward detection and characterization of variability bugs in configurable C software: an empirical study. Student research competition track. In the IEEE/ACM 41st International Conference on Software Engineering: Companion Proceedings (ICSE-Companion), pages 153–155, 2019. **Winner of the Student Research Competition.**

Under Revision

HOST '24 Samit Miftah, Shamik Kundu, **Austin Mordahl**, Shiyi Wei and Kanad Basu. RTL-Spec: RTL spectrum analysis for security bug localization. Conditionally accepted to the IEEE International Symposium on Hardware Oriented Security and Trust (HOST), 2024.

ICSE '24 Dakota Soles, Miao Miao, **Austin Mordahl**, and Shiyi Wei. An extensive empirical study of nondeterministic behavior in static analysis tools. Under major revision at the IEEE/ACM 46th International Conference on Software Engineering (ICSE), 2024.

EMSE Zachary Patterson, **Austin Mordahl**, Paul Gazzillo, and Shiyi Wei. An exploration of static variability bug detection through desugaring. Under major revision at Empirical Software Engineering (EMSE), 2023.

Under Review

USENIX Security '24 Zenong Zhang, **Austin Mordahl**, Eric Su Zhang, Meah Tahmeed Ahmed, and Shiyi Wei. Evaluating internal mechanisms in fuzz testing. Under review at the 33rd USENIX Security Symposium, 2024.

TOSEM Jaeseong Lee, Simin Chen, **Austin Mordahl**, Cong Liu, Wei Yang, and Shiyi Wei. Automated testing linguistic capabilities of NLP models. Under review at ACM Transactions on Software Engineering and Methodology (TOSEM), 2023.

Presentations

2023 Automated feature-aware benchmark generation for static analysis via dynamic projections. UTD Research Days. Richardson, TX, USA. 2023.

ISSTA '23 DS Automatic testing and benchmarking for configurable static analysis tools. ISSTA Doctoral Symposium track. Seattle, USA. 2023.

ISSTA '23 Tool ECSTATIC: Automatic configuration-aware testing and debugging of static analysis tools. ISSTA Tool demonstration track. Seattle, USA. 2023.

ISSTA '23 Poster An exploration of static variability bug detection through desugaring. ISSTA Poster track. Seattle, USA. 2023.

ICSE '23 ECSTATIC: An extensible framework for testing and debugging configurable static analysis. ICSE Technical track. Melbourne, Australia. 2023.

ICSE '23 Poster — ECSTATIC: An extensible framework for testing and debugging configurable static analysis. ICSE Poster track. Melbourne, Australia. 2023.

ISSTA '21 — The impact of tool configuration spaces on the evaluation of configurable taint analysis for Android. ISSTA Technical track. Virtual. 2021.

ESEC/FSE '19 — An empirical study of real-world variability bugs detected by variability-oblivious tools. ESEC/FSE Technical track. Tallin, Estonia. 2019.

ICSE '19 — Toward detection and characterization of variability bugs in configurable C software: an empirical study. ICSE Student Research Competition track. Montréal, Canada. 2019.

Professional Experience

Program Committee Service and Journal Referee

2023 Reviewer for Journal of Software: Evolution and Process

2023 ECOOP Extended Review Committee within the Research Paper Track

2023 ECOOP Artifact Evaluation Committee

2022 ASE Artifact Evaluation Committee

2022 PLDI Artifact Evaluation Committee

2020 ECOOP Doctoral Symposium

Reviews Solicited by Technical Program Committee Members

2023 ISSTA Subreviewer

2022, 2023 ICSE Subreviewer

2019, 2020, 2023 ESEC/FSE Subreviewer

2023 SecDev Subreviewer

2022 Crypto Subreviewer

2022 ICST Subreviewer

2021 TSE Subreviewer

Volunteer Experience

SPUR is the Summer Platform for Undergraduate Research competition, held annually at the University of Texas at Dallas.

2023 SPUR Competition, Judge

2022 SPUR Competition, Judge

2020 ACM Conference on Computer and Communications Security (CCS) Student Volunteer

2019 ESEC/FSE Student Volunteer

Teaching Experience

2023 **Guest Lecturer** for Fall 2023 Battle of the Brains High School Coding Contest at the University of Texas at Dallas. Prepared material and delivered interactive lecture on static analysis and fuzzing for ensuring software quality.

2022 **Software Testing and Analysis Workshop** instructor. Taught a software security summer school workshop for a group of 12 high school students. Developed course materials and gave instruction in software testing, penetration, and analysis techniques. One student, Eric Su Zhang, has continued working with our lab to this day, resulting in a coauthored article (under review at USENIX Security).

2019 **Guest Lecturer (CS 7301)** in graduate software testing and analysis course taught by Dr. Shiyi Wei. Prepared and delivered course material about unification in type systems.

2018 **Software Engineering (CS/SE 3354)** course TA, taught by Dr. Shiyi Wei. Helped design course materials (projects and assignments) and supervise student software engineering group projects. Met with students regularly to review and give suggestions about project progress.

2015-2018 **Improvisational Theatre** extracurricular instructor. Developed materials and taught various aspects of improvisational theatre, culminating in a public showcase each semester.

2016–2017 **Freshman Seminar (ATEM 1100)** course instructor. Developed and taught course materials aimed at acclimating new freshman to the college experience, and provide them with instruction in various aspects of life, such as studying and managing personal finances.

Advising Experience

SPUR is the Summer Platform for Undergraduate Research competition, held annually at the University of Texas at Dallas.

Graduate Students

2023 Miao Miao, current Ph.D. student. Serving as mentor, helping to supervise research leading to two coauthored works (one published and one under review).

2022–2023 Dakota Soles, former Ph.D. student. Served as mentor, helping to supervise research resulting in two coauthored works (one published and one under review).

Undergraduate Students

2020-2022 Dakota Soles, B.S. Computer Science. Mentored and supervised research leading to two coauthored works. Winner of SPUR competition, 2022.

2022 Joshua Das, B.S. Computer Science. Mentored for the Clark Summer Research Program, where incoming freshman get to perform research during the summer before starting school in the fall. Supervised research into detecting bugs in static analysis. Winner of SPUR competition, 2022.

2022 Emma Schaumann, B.S. Computer Science. Mentored for the Clark Summer Research Program. Supervised research into automatic benchmarking of static analysis.

High School Students

2022-2023 Eric Su Zhang, Current High School Student. Mentored for two years, resulting in a conference submission (currently under review at USENIX Security). Winner of the SPUR competition in 2023.

2022 Alexis Lance. Mentored for summer, supervised research into static analysis evaluation.

2022 Dhilan Patel. Mentored for summer, supervised research into variability-aware static analysis techniques.

2022 Aadithya Srinivasan. Mentored for summer, supervised research into selective and adaptive static analysis techniques.

References

Shiyi Wei (advisor)
Associate Professor
Dept. of Computer Science, The University of Texas at Dallas
Richardson, TX
https://utdallas.edu/~swei
swei@utdallas.edu

Jeffrey S. Foster
Department Chair, Professor
Dept. of Computer Science, Tufts University
Medford, MA
https://www.cs.tufts.edu/~jfoster/
jeffrey.foster@tufts.edu

Eric Bodden
Professor
Secure Software Engineering, Paderborn University
Co-Director
Fraunhofer Instutitue for Mechatronic Systems Design
Paderborn, Germany
https://www.hni.uni-paderborn.de/en/sse/staff/bodden/
eric.bodden@uni-paderborn.de

Andrian Marcus
Professor
Department of Computer Science, George Mason Univeristy
Fairfax, VA
https://www.andrianmarcus.net
amarcus7@gmu.edu