Owolabi Legunsen

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Research Interests

Software Engineering, with a focus on Runtime Verification and Software Testing

Academic Employment

July 2020 – Now Assistant Professor, CS Department, Cornell University

Education

2019 **Ph.D. Computer Science**, *University of Illinois at Urbana-Champaign (UIUC).*
Dissertation: Evolution-Aware Runtime Verification
Advisors: Darko Marinov and Grigore Roşu

2012 **M.S. Computer Science**, *University of Texas at Dallas (UTD).*

2007 **B.Sc. Computer Engineering**, *Obafemi Awolowo University (OAU), Nigeria.*

Honors and Awards

2025 ACM SIGSOFT Distinguished Paper Award at ASE 2025

2024 ACM SIGSOFT Distinguished Paper Award at ISSTA 2024

2023 Intel Rising Star Faculty Award

2023 ACM SIGSOFT Distinguished Paper Award at ISSTA 2023

2021 – 2026 NSF CAREER Award

2021 Finalist, Microsoft Faculty Research Fellowship

2017 Feng Chen Memorial Award in Software Engineering, CS Department, UIUC

2016 ACM SIGSOFT Distinguished Paper Award at ASE 2016

Publications

ASE 2025 [1] Shinhae Kim, Saikat Dutta, and **Owolabi Legunsen**. *"Faster Runtime Verification during Testing via Feedback-Guided Selective Monitoring"*. IEEE/ACM International Conference on Automated Software Engineering, pages to–appear, Seoul, Korea, November 2025. Acceptance rate: 21.6% (246/1,136)
This paper won an ACM SIGSOFT Distinguished Paper Award

OOPSLA 2025 [2] Kevin Guan, Marcelo d'Amorim, and **Owolabi Legunsen**. *"Faster Explicit-Trace Monitoring-Oriented Programming for Runtime Verification of Software Tests"*. The ACM SIGPLAN International Conference on Systems, Programming, Languages and Applications (OOPSLA 2025), pages to–appear, Singapore, October 2025. Acceptance rate: 35% (210/590)

FSE'Demo '25 [3] Kevin Guan and **Owolabi Legunsen**. *"TraceMOP : An Explicit-Trace Runtime Verification Tool for Java"*. ACM International Conference on the Foundations of Software Engineering (FSE 2025), pages 1218–1222, Trondheim, Norway, June, 2025. Acceptance rate: 64% (41/64)

ICSE 2025 [4] Kevin Guan and **Owolabi Legunsen**. *"Instrumentation-Driven Evolution-Aware Runtime Verification"*. 47th IEEE/ACM International Conference on Software Engineering (ICSE 2025), pages 103–115, Ottawa, Canada, April-May, 2025. Acceptance rate: 21% (245/1150)

ISSTA 2024 [5] Kevin Guan and **Owolabi Legunsen**. *"An In-depth Study of Runtime Verification Overheads during Software Testing"*. The 33rd ACM SIGSOFT International Symposium on Software Testing and Analysis (ISSTA 2024), pages 1798–1810, Vienna, Austria, September, 2024. Acceptance rate: 20.6% (143/694)
This paper won an ACM SIGSOFT Distinguished Paper Award

FSE Demo '24 [6] Yu Liu, Aditya Thimmaiah, **Owolabi Legunsen**, and Milos Gligoric. *"ExLi : An Inline-Test Generation Tool for Java"*. ACM International Conference on the Foundations of Software Engineering (FSE 2024), pages 652–656, Porto de Galinhas, Brazil, Brazil, July, 2024. Acceptance rate: 52% (22/42)

SOSP 2023 [7] Tyler Gu, Xudong Sun, Yuxuan Jiang, Chen Wang, Mandana Vaziri, **Owolabi Legunsen**, and Tianyin Xu. *"Acto: Automatic End-to-End Testing for Operation Correctness of Cloud System Management"*. The 29th ACM Symposium on Operating Systems Principles (SOSP 2023), pages 96–112, Koblenz, Germany, October 2023. Acceptance rate: 18% (43/229)

RV 2023 [8] Ayaka Yorihiro, Pengyue Jiang, Valeria Marqués, Benjamin Carleton, and **Owolabi Legunsen**. *"eMOP: A Maven Plugin for Evolution-Aware Runtime Verification"*. The 23rd International Conference on Runtime Verification (RV 2023), pages 363–375, Thessaloniki, Greece, October 2023.

TSE 2023 [9] Adriano Torres, Pedro Costa, Luis Amaral, Jonata Pastro, Rodrigo Bonifácio, Marcelo d'Amorim, **Owolabi Legunsen**, Eric Bodden, and Edna Dias Canedo. *"Runtime Verification of Crypto APIs: An Empirical Study"*. IEEE Transactions on Software Engineering (TSE 2023), pages 4510–4525, Journal, October 2023.

ISSTA 2023 [10] Yu Liu, Jiyang Zhang, Pengyu Nie, Milos Gligoric, and **Owolabi Legunsen**. *"More Precise Regression Test Selection via Reasoning about Semantics-Modifying Changes"*. The 32nd International Symposium on Software Testing and Analysis (ISSTA 2023), pages 664–676, Seattle, USA, July 2023. Acceptance rate: 31% (117/372)
This paper won an ACM SIGSOFT Distinguished Paper Award

ISSTA 2023 [11] Yu Liu, Pengyu Nie, Anna Guo, Milos Gligoric, and **Owolabi Legunsen**. *"Extracting Inline Tests from Unit Tests"*. The 32nd International Symposium on Software Testing and Analysis (ISSTA 2023), pages 1458–1470, Seattle, USA, July 2023. Acceptance rate: 31% (117/372)

ICSE Demo '23 [12] Yu Liu, Zachary Thurston, Alan Han, Pengyu Nie, Milos Gligoric, and **Owolabi Legunsen**. *"pytest-inline: An Inline Testing Tool for Python"*. The 45th International Conference on Software Engineering, Tool Demonstrations Track (ICSE Demo 2023), pages 161–164, Melbourne, Australia, May 2023. Acceptance rate: 48% (38/80)

ASE 2022 [13] Yu Liu, Pengyu Nie, **Owolabi Legunsen**, Milos Gligoric. *"Inline Tests"*. The 37th IEEE/ACM International Conference on Automated Software Engineering (ASE 2022), pages 1–13, Ann Arbor, Michigan, October 2022. Acceptance rate: 22% (116/527)

AST 2022 [14] Jiyang Zhang, Yu Liu, Milos Gligoric, **Owolabi Legunsen**, August Shi. *"Comparing and Combining Analysis-Based and Learning-Based Regression Test Selection"*. 3rd ACM/IEEE International Conference on Automation of Software Test (AST 2022), pages 17–28, Pittsburgh, Pennsylvania, May 2022.

ICSE 2021 [15] Yuanliang Zhang, Haochen He, **Owolabi Legunsen**, Shanshan Li, Wei Dong, and Tianyin Xu. *"An Evolutionary Study of Configuration Design and Implementation in Cloud Systems"*. 43rd International Conference on Software Engineering (ICSE 2021), pages 188–200, Virtual Conference, May 2021. Acceptance rate: 23% (138/602)

OSDI 2020 [16] Xudong Sun, Runxiang Cheng, Jianyan Chen, Elaine Ang, **Owolabi Legunsen**, and Tianyin Xu. *"Testing Configuration Changes in Context to Prevent Production Failures"*. 14th USENIX Symposium on Operating Systems Design and Implementation (OSDI 2020), pages 735–751, Virtual Conference, November 2020. Acceptance rate: 17% (70/398)

FSE 2020 [17] Qingrong Chen, Teng Wang, **Owolabi Legunsen**, Shanshan Li, and Tianyin Xu. *"Understanding and Discovering Software Configuration Dependencies in Cloud and Datacenter Systems"*. 28th ACM European Software Engineering Conference & Symposium on the Foundations of Software Engineering (ESEC/FSE 2020), pages 725–737, Virtual Conference, November 2020. Acceptance rate: 28% (101/360)

ICST 2020 [18] Breno Miranda, Igor Lima, **Owolabi Legunsen**, and Marcelo d'Amorim. *"Prioritizing Runtime Verification Violations"*. 13th IEEE International Conference on Software Testing, Verification and Validation (ICST 2020), pages 297-308, Virtual Conference, November 2020. Acceptance rate: 24% (27/114)

JASE 2019 [19] **Owolabi Legunsen**, Nader Al Awar, Xinyue Xu, Wajih Ul Hassan, Grigore Roşu, and Darko Marinov. *"How Effective are Existing Java API Specifications for Finding Bugs during Runtime Verification?"*. Automated Software Engineering Journal (JASE), pages 26(4): 795-837, Invited journal submission, December 2019. Journal Extension of ASE 2016 paper.

OOPSLA 2019 [20] August Shi, Milica Hadzi-Tanovic, Lingming Zhang, Darko Marinov, and **Owolabi Legunsen**. *"Reflection-Aware Static Regression Test Selection"*. 34th ACM SIGPLAN International Conference on Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA 2019), pages 187:1–187:29, Athens, Greece, October, 2019. Acceptance rate: 36% (72/201)

ICSE 2019 [21] Chenguang Zhu, **Owolabi Legunsen**, August Shi, and Milos Gligoric. *"A Framework for Checking Regression Test Selection Tools"*. 41st IEEE/ACM International Conference on Software Engineering (ICSE 2019), pages 430–441, Montreal, Canada, May 2019. Acceptance rate: 21% (109/529)

ICST 2019 [22] **Owolabi Legunsen**, Yi Zhang, Milica Hadzi-Tanovic, Grigore Roşu, and Darko Marinov. *"Techniques for Evolution-Aware Runtime Verification"*. 12th IEEE International Conference on Software Testing, Verification and Validation (ICST 2019), pages 312–322, Xi'an, China, April 2019. Acceptance rate: 28% (31/110)

FSE 2018 [23] Saikat Dutta, **Owolabi Legunsen**, Zixin Huang, and Sasa Misailovic. *"Testing Probabilistic Programming Systems"*. 26th ACM European Software Engineering Conference & Symposium on the Foundations of Software Engineering (ESEC/FSE 2018), pages 574–586, Lake Buena Vista, FL, November 2018. Acceptance rate: 21% (61/295)

ISSRE 2018 [24] Alex Gyori, **Owolabi Legunsen**, Farah Hariri, and Darko Marinov. *"Evaluating Regression Test Selection Opportunities in a Very Large Open-Source Ecosystem"*. 29th IEEE International Symposium on Software Reliability Engineering (ISSRE 2018), pages 112–122, Memphis, TN, October 2018. Acceptance rate: 24% (23/96)

ICSE 2018 [25] Jonathan Bell, **Owolabi Legunsen**, Michael Hilton, Lamyaa Eloussi, Tifany Yung and Darko Marinov. *"DeFlaker: Automatically Detecting Flaky Tests"*. 40th IEEE/ACM International Conference on Software Engineering (ICSE 2018), pages 433–444, Gothenburg, Sweden, May-June 2018. Acceptance rate: 21% (105/502)

ICST 2018 [26] Farah Hariri, August Shi, **Owolabi Legunsen**, Milos Gligoric, Sarfraz Khurshid, and Sasa Misailovic. *"Approximate Transformations as Mutation Operators"*. 11th IEEE International Conference on Software Testing, Verification and Validation (ICST 2018), pages 285–296, Västerås, Sweden, April 2018. Acceptance rate: 25% (30/119)

ASE Demo '17 [27] **Owolabi Legunsen**, August Shi, and Darko Marinov. *"STARTS: STAtic Regression Test Selection"*. 32nd IEEE/ACM International Conference on Automated Software Engineering, Tool Demo **(ASE Demo 2017)**, pages 949–954, Urbana-Champaign, IL, November 2017. Acceptance rate: 63% (20/32)

FSE 2016 [28] **Owolabi Legunsen**, Farah Hariri, August Shi, Yafeng Lu, Lingming Zhang, and Darko Marinov. *"An Extensive Study of Static Regression Test Selection in Modern Software Evolution"*. 23rd ACM SIGSOFT International Symposium on the Foundations of Software Engineering (FSE 2016), pages 583–594, Seattle, WA, November 2016. Acceptance rate: 28% (74/273)

FSE Demo '16 [29] Alex Gyori, Ben Lambeth, August Shi, **Owolabi Legunsen**, and Darko Marinov. *"NonDex: A Tool for Detecting and Debugging Wrong Assumptions on Java API Specifications"*. 23rd ACM SIGSOFT International Symposium on the Foundations of Software Engineering, Tool Demo (FSE Demo 2016), pages 993–997, Seattle, WA, November 2016. Acceptance rate: 41% (13/32)

ASE 2016 [30] **Owolabi Legunsen**, Wajih Ul Hassan, Xinyue Xu, Grigore Roşu, and Darko Marinov. *"How Good are the Specs? A Study of the Bug-Finding Effectiveness of Existing Java API Specifications"*. 31st IEEE/ACM International Conference on Automated Software Engineering(ASE 2016), pages 602–613, Singapore, Singapore, September 2016. Acceptance rate: 20% (57/298)
This paper won an ACM SIGSOFT Distinguished Paper Award and was invited for journal submission

ICST 2016 [31] August Shi, Alex Gyori, **Owolabi Legunsen**, and Darko Marinov. *"Detecting Assumptions on Deterministic Implementations of Non-deterministic Specifications"*. 9th IEEE International Conference on Software Testing, Verification and Validation (ICST 2016), pages 80–90, Chicago IL, April 2016. Acceptance rate: 27% (34/130)

ICSE NIER '15 [32] **Owolabi Legunsen**, Darko Marinov, and Grigore Roşu. *"Evolution-Aware Monitoring-Oriented Programming"*. 37th IEEE/ACM International Conference on Software Engineering, NIER Track (ICSE NIER 2015), pages 615–618, Florence, Italy, May 2015. Acceptance rate: 19%, (25/135)

ASE 2014 [33] Milos Gligoric, Stas Negara, **Owolabi Legunsen**, and Darko Marinov. *"An Empirical Evaluation and Comparison of Manual and Automated Test Selection"*. 29th IEEE/ACM Conference on Automated Software Engineering (ASE 2014), pages 361–372, Västerås, Sweden, September 2014. Acceptance rate: 20% (55/276)

JSS [34] Lawrence Chung, Tom Hill, **Owolabi Legunsen**, Zhenzhou Sun, Adip Dsouza, and Sam Supakkul. *"A Goal-Oriented Simulation Approach for Obtaining Good Private Cloud-Based System Architectures"*. Journal of Systems and Software (JSS), pages 86(9): 2242–2262, Invited journal submission, 2013.

Funding

5 NSF grants, 2 industry awards. Total: over $2.2M. My share: over $1.5M.

2025 – 2027 *FMitF: Track II: Enabling Pluggable Runtime Verification Optimizations*, co-PI: Owolabi Legunsen, PI: Rahul Purandare. NSF Formal Methods in the Field grant no. 2525243. Amount: $150k. My share: $75k

2024 – 2028 *SHF: Medium: Fine-Grained Software Testing*, PI: Owolabi Legunsen, co-PI: Milos Gligoric. National Science Foundation grant no. 2403035. Amount: $1,200,000. My share: $600k

2023 *Intel Rising Star Faculty Award*. Unrestricted gift. Amount: $50k. Sole PI.

2023 – 2025 *FMitF: Track II: Cross-Language Support for Runtime Verification*, co-PI: Owolabi Legunsen, PI: Marcelo d'Amorim. NSF Formal Methods in the Field grant No. 2319473. Amount: $100k. My share: $50k

2023 Google Cyber NYC Institutional Research Award. *Safe Program Generation and Deployment by Large Language Models*, PI: Kevin Ellis, co-PIs: Alexandra Silva, Owolabi Legunsen. Amount: $80k. My share: $26k

2021 – 2026 *CAREER: Specializing Runtime Verification for Software Testing*, NSF grant No. CCF-2045596. Amount: $585k (plus $16.8k REU). Sole PI.

2020 – 2021 *FMitF: Track II: eMOP: A Tool for Evolution-Aware Runtime Verification*, PI: Owolabi Legunsen, NSF Formal Methods in the Field grant No. CCF-2019277. Amount: $100k. Sole PI.

Students

I am working with the following excellent students:

PhD Student Kevin Guan, won ACM SIGSOFT Distinguished Paper Award at ISSTA'24

PhD Student Pengyue Jiang, awarded a Cornell CS Department Fellowship in 2023

PhD Student Shinhae Kim (co-advisor: Saikat Dutta), awarded 2024 Cornell CS Department Fellowship, won ACM SIGSOFT Distinguished Paper Award at ASE'25

PhD Student David Rodriguez, awarded 2025 Cornell Bowers CIS Dean's Excellence Fellowship

PhD Student Stephen Shen

PhD Student Joonhwan Yoo

Alumni:

PhD Yu Liu (co-advisor: with Milos Gligoric), graduated: Summer'24, won ACM SIGSOFT Distinguished Paper Award at ISSTA'23, first job: Meta

MS Valeria Marqués, graduated: Spring'24, first job: Apple

MEng Tianxing Jiang, graduated: Spring'21, first job: Citadel Securities, Chicago IL

MEng Alan Han, graduated: Spring'25, first job: Amazon

MEng Andres Hernandez Arciniegas, graduated: Spring'22, first job: Komodo Health

MEng Jacob Kerr, graduated: Spring'24, first job: Addepar

MEng Mitchell Gray, graduated: Spring'24, first job: Oracle

MEng Owen Ralbovsky, graduated: Spring'24, first job: Goldman Sachs

MEng Alan Han, graduated: Spring'25, first job: Amazon

BS Tito Maresca, graduated: Spring'23, first job: JP Morgan Chase

BS Zachary Thurston, graduated: Spring'23, first job: Goldman Sachs

BS	Alan Han, graduated: Fall'24, next: MEng at Cornell University

PhD Committee Membership:

Cornell	Griffin Berlstein, advisor: Adrian Sampson
UT Austin	Chengpeng Li, advisor: August Shi, defended in August 2025
Cornell	Wen-Ding Li, advisor: Kevin Ellis, defended in April 2025
UT Austin	Ziqiang Zang, advisor: Milos Gligoric, defended in January 2024

Students mentored as part of the UIUC+ Summer Research Program in Software Engineering:

UIUC	Pengyue Jiang (Summer'22 to Summer'23. Next: PhD student at Cornell)
LUMS, Pakistan	Muhammad Taha (Summer and Fall'22. Next: MS student at Purdue)
Zhejiang U.	Yuxuan Jiang (Summer'22 to Summer'23. Next: PhD student at UMich)
USTC	Cheng Ding (Fall'23. Next: PhD student at UT Austin)
METU	Moustafa Ismail (Summer'22 till Fall'23. Next: PhD student at UCSB)
UIUC	Jun Yang (Summer'23 till Spring'24. Next: PhD student at U of Chicago)
UIUC	Kunle Li (Summer'22, Fall'22. Next: MS student at CMU)
METU	Mahdi Khosravi (Summer'22 till Fall'23. Next: MS student at METU)
U. of Edinburgh	Stephen Shen (Summer'23 till Spring'24. Next: MS student at Cornell Tech)
Peking University	Nan Huang (Summer'23.)
Uniandes	Sebastian Urrea (Summer'23.)
UVA	Junho Lee (Summer'23.)
CUHK	Xiaoyuan Liu (Summer'23.)
CUHK	Haoxuan Wang (Summer'24.)
Cornell	Tami Takada (Summer'24.)
Belgrade	Feda Filipovic (Summer'24.)
Addis Ababa U.	Hermon Getachew (Summer'25)
IIIT Delhi	Sanchay Singh (Summer'25)
Sun Yat-sen U.	Kefeng Duan (Summer'25)

Previous Research Advising (at UIUC)

*At UIUC, I mentored and co-advised the research of **six female** graduate students and **four undergraduate** students. Of the 9, 7 co-authored at least one submission to a top Software Engineering or Systems venue with me.*

MS Student	Elaine Ang (First job: Google)
MS Student	Milica Hadzi-Tanovic (Siebel Scholar '18. Next: Ph.D., TU Munich)
MS Student	Xinyue Xu (First job: Google)
MCS Student	Tifany Yung (First job: Groupon)
MCS Student	Felicia Chandra (ASE 2017 Web Chair. First job: NextCapital)
Undergrad	Benjamin (Ben) Lambeth (BS, UIUC)
Undergrad	Zixin Huang (Next: PhD Student, UIUC)
Undergrad (REU)	Nader Al Awar (BS, American University of Beirut. Next: PhD, UT Austin)
Undergrad (REU)	Karl Hajal (BS, American University of Beirut)

Teaching Experience

Cornell+UT, Jan'21 - Now	Cornell-UT Austin weekly Software Engineering Seminar
Cornell, Fall'25	Instructor for CS 5154: Software Testing
Cornell, Spring'25	Instructor for CS 6156: Runtime Verification
Cornell, Fall'24	Co-instructor for CS 2110: Object-Oriented Programming and Data Structures
Cornell, Spring'24	Instructor for CS 6156: Runtime Verification
Cornell, Fall'23	Instructor for CS 5154: Software Testing
CMMRS, Aug'23	Lecturer for *Specializing Runtime Verification for Software Testing*, The Cornell, Maryland, Max Planck Pre-doctoral Research School (CMMRS), August 2023
Cornell, June'23	Instructor for 1-week CSMore Bootcamp
Cornell, Spring'23	Instructor for CS 6156: Runtime Verification
Cornell, Fall'22	Instructor for CS 5154: Software Testing
Cornell, July '22	Instructor for 1-week CSMore Bootcamp
Cornell, Spring'22	Instructor for CS 6156: Runtime Verification
Cornell, Fall'21	Instructor for CS 5154: Software Testing
Cornell, June '21	Instructor for 1-week CSMore Bootcamp
Cornell, Spring'21	Instructor for CS 5154: Software Testing
Cornell, Fall'20	Instructor for CS 6156: Runtime Verification
UIUC, Fall'17	Project Mentor for CS 527: Advanced Topics in Software Engineering
UIUC, Spring'15	Taught one class on "Software Testing for Fun, Fame and maybe even Profit" to 19 high school students
UIUC, Fall'14	Project Mentor for CS 527: Advanced Topics in Software Engineering
UIUC, Fall'13	Teaching Assistant for CS 427: Software Engineering I
UTD, Spring'13	Teaching Assistant for CS 6371: Advanced Programming Languages
UTD, Spring'13	Teaching Assistant for CS 6362: Software Architectural Design
UTD, Fall'12	Teaching Assistant for CS 6367: Software Testing, Validation and Verification
UTD, Fall'12	Teaching Assistant for CS 6387: Advanced Software Engineering Project

Some Open-Source Software Contributions by my Group

My GitHub ID	`https://github.com/owolabileg`
iMOP	iMOP is an evolution-aware runtime verification tool. Unlike eMOP (below), which is specification-driven, iMOP is instrumentation driven and seeks to speed up runtime verification by only re-instrumenting changed code in a new revision. iMOP can be found at `https://github.com/SoftEngResearch/imop`
TraceMOP	TraceMOP is a runtime verification tool that modernizes and adds trace awareness to the mature and widely-cited JavaMOP tool. TraceMOP allows developers to monitor program executions against formal specifications (as JavaMOP does) while also (optionally) tracking the traces that are being checked. I lead the development of TraceMOP as part of my research to make runtime verification easier to use during software testing. TraceMOP can be found at `https://github.com/SoftEngResearch/tracemop`.

eMOP	eMOP is an evolution-aware runtime verification tool. It allows developers to perform runtime verification incrementally as software evolves, with the goal to make runtime verification easier to use during software testing. eMOP can be found at `https://github.com/SoftEngResearch/emop`
pytest-inline	An inline testing tool for Python that we developed to bring our recently-proposed approach for validating individual program statements closer to developers. pytest-inline is now an official plugin for pytest, the most widely-used Python testing framework. Till date, pytest-inline has been downloaded 7,308 times. The official pytest-inline plugin can be found at `https://pypi.org/project/pytest-inline` and the repository can be found at `https://github.com/pytest-dev/pytest-inline`.
ExLi	A tool for automatically generating inline tests by extracting them from unit tests. More details about ExLI can be found at `https://github.com/EngineeringSoftware/exli`
Found 500+ bugs in 100+ open-source projects	Bugs reported under the following GitHub pseudonyms for double-blind review: `emopers`, `flakycov`, `lazypanda1`, and `testingsavvy`. My research helped discover over 500 bugs in more than 100 open-source projects, including critical and well-tested applications (Apache Zookeeper, Apache Pig, Joda-Time, ActiveMQ, CheckStyle, etc.), testing/analysis frameworks (TestNG, bcel, Clover, Ekstazi, etc.), probabilistic programming systems (Edward, Pyro, Stan), and machine learning frameworks (TensorFlow and PyTorch)
STARTS (STAtic Regression Test Selection)	I lead research and development of STARTS, a tool to reduce regression testing costs by rerunning only tests that can change behavior due to code changes. STARTS saves up to 80% of testing time on medium-sized open-source projects. STARTS can be found at `https://github.com/TestingResearchIllinois/starts`
NonDex	NonDex detects flaky tests caused by developers' wrong assumptions about underdetermined specification. Flaky tests non-deterministically pass or fail for the same code. NonDex was adopted by CheckStyle. NonDex can be found at `https://github.com/TestingResearchIllinois/nondex`
DeFlaker	DeFlaker determines that a test is flaky if the test failed but did not cover any changed code. DeFlaker uses a novel differential coverage approach to check if test failures are flaky. DeFlaker can be found at `http://www.deflaker.org`
ProbFuzz	ProbFuzz extends compiler fuzzing to the domain of probabilistic and approximate programming, and is the first automated framework for systematically testing probabilistic programming systems. ProbFuzz can be found at `https://www.probfuzz.com`

Service to Professional Community

PC Member	International Symposium on Software Testing and Analysis (ISSTA), 2026
Reviewer	Information and Software Technology (IST) Journal, 2025
Panelist	New Faculty Symposium at ASE 2025
PC Member	International Conference on Software Engineering (ICSE), 2025
RC Member	Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA), 2024
PC Member	International Symposium on Software Testing and Analysis, Tool Demonstrations track (ISSTA-Demo), 2024
Panelist	ISSTA 2023 Doctoral Symposium

PC Member	Java PathFinder Workshop (JPF), 2023
Co-Editor	International Journal on Software Tools for Technology Transfer (STTT) Special Issue on SPIN 2022 and SPIN 2023
PC Member	Programming Language Design and Implementation (PLDI), 2023
PC Member	International Symposium on Software Testing and Analysis (ISSTA), 2023
PC Member	ESEC/FSE Student Research Competition, 2023
Reviewer	Transactions on Software Engineering and Methodology (TOSEM), 2023
Reviewer	Journal of Systems and Software (JSS), 2023
Co-Organizer	International Symposium on Model Checking of Software (SPIN), 2022
Faculty Mentor	ICSE 2022 Mentorship Program, Pittsburgh, May 2022
PC Member	International Conference on Foundations of Software Engineering (FSE), 2022
PC Member	International Conference on Software Engineering (ICSE), 2022
PC Member	International Conference on Computer-Aided Verification (CAV), 2021
Co-Organizer	International Symposium on Model Checking of Software (SPIN), 2020. *All the organizational work for this event was done. But we decided to cancel shortly before the paper submission deadline because of the COVID pandemic*
PC Member	Languages and Tools for Next Generation Testing Workshop (LANGETI), 2020
PC Member	OOPSLA Student Research Competition, 2020
PC Member	International Conference on Automated Software Engineering (ASE), 2020
Demo Co-Chair	International Symposium on Software Testing and Analysis (ISSTA), 2020
PC Member	International Conference on Software Testing, Verification and Validation (ICST), Industry Track, 2020
PC Member	International Symposium on Software Testing and Analysis (ISSTA), Artifact Evaluation Committee, 2017
Student Volunteer Chair	International Conference on Automated Software Engineering (ASE), 2017
Student Member	CS Department Graduate Student Admissions Application Review Committee, UIUC, Fall/Summer 2016
CS Ambassador	CS Department Graduate Student Ambassador for 2 incoming Ph.D. students at UIUC in Fall 2016
Student Volunteer	ESEC/FSE 2015, Bergamo, Italy, September 2015
Co-organizer	Brett Daniel Software Engineering Seminar for Fall 2015 at UIUC
Volunteer	ASPIRE UIUC Campus Visit Program for Underrepresented Minorities. Met 2 candidates, UIUC, Fall 2014
Co-Reviewer	ICSE 2020, ICST 2020, RV 2019, DATE 2019, ISSTA 2018, FM 2018, ⟨Programming⟩ 2017, ASE 2016, ICST 2016, TACAS 2016, ASE 2015, RV 2015, HVC 2014, ICSE 2014, ASE 2013

Funding Evaluation

NSF Panelist	One remote panel at the National Science Foundation (NSF), 2025
NSF Panelist	One remote panel at the National Science Foundation (NSF), 2024
Reviewer	Reviewed 1 proposal for European Research Council (ERC), 2023
Reviewer	Reviewed 1 proposal for the Natural Sciences and Engineering Research Council (NSERC) of Canada, 2023
NSF Panelist	Two remote panels at the National Science Foundation (NSF), 2021

Presentations

Invited Talk	*Identifying and Exploiting Root Causes of Runtime Verification Overheads*, IFIP Working Group 2.4, Singapore, February 2025
Conference Talk	*An In-Depth Study of Runtime Verification Overheads during Software Testing*, ISSTA, Vienna Austria, 2024
Guest Lecture	*Introduction to Software Engineering Research*, CSMore, Cornell University, Summer 2024
Invited Talk	*Specializing Runtime Verification for Software Testing*, S3D Distinguished Speaker Series at Carnegie Mellon University, Pittsburgh, November 2023
Invited Talk	*Specializing Runtime Verification for Software Testing*, National University of Singapore Programming Languages and Software Engineering Seminar, remote, November 2023
Panelist	*My Job Search Experience*, CS591SCH: PhD Job Search Seminar, UIUC, Fall 2023
Invited Talk	*Integrating Runtime Verification & Software Testing*, IFIP Working Group 2.4, York Harbor, April 2023
Panelist	*My Job Search Experience*, CS591SCH: PhD Job Search Seminar, UIUC, Fall 2021
Guest Lecture	*Integrating Runtime Verification & Software Testing*, EE360T, UT, Spring 2021
Invited Talk	*Integrating Runtime Verification & Software Testing*, IST Austria, January 2021
Panelist	*Insights into the Academic Job Search*, CS Brown Bag Seminar, Cornell, Fall 2020
Guest Lecture	*Regression Testing*, CSMore, Cornell University, Summer 2020
Guest Lecture	*Combining Runtime Verification and Software Testing*, CS 427, UIUC, Fall 2019
Invited Talk	*Evolution-Aware Runtime Verification*, Cornell University, April 2019
Invited Talk	*Evolution-Aware Runtime Verification*, U. of Southern California, April 2019
Invited Talk	*Evolution-Aware Runtime Verification*, Michigan State University, April 2019
Invited Talk	*Evolution-Aware Runtime Verification*, Oregon State University, April 2019
Invited Talk	*Evolution-Aware Runtime Verification*, Texas A&M University, April 2019
Invited Talk	*Evolution-Aware Runtime Verification*, U. of Maryland College Park, April 2019
Invited Talk	*Evolution-Aware Runtime Verification*, U. of Nebraska at Lincoln, March 2019
Invited Talk	*Evolution-Aware Runtime Verification*, University of Minnesota, March 2019
Invited Talk	*Evolution-Aware Runtime Verification*, UMass Amherst, March 2019
Invited Talk	*Evolution-Aware Runtime Verification*, UC Santa Cruz, March 2019
Invited Talk	*Evolution-Aware Runtime Verification*, UC San Diego, March 2019
Invited Talk	*Evolution-Aware Runtime Verification*, University of Rochester, March 2019
Invited Talk	*Evolution-Aware Runtime Verification*, U. of Illinois at Chicago, March 2019
Invited Talk	*Evolution-Aware Runtime Verification*, UT Austin, February 2019
Invited Talk	*Evolution-Aware Runtime Verification*, UC Santa Barbara, February 2019
Invited Talk	*Evolution-Aware Runtime Verification*, George Mason University, February 2019
Invited Talk	*Evolution-Aware Runtime Verification*, Drexel University, February 2019
Seminar	*Evolution-Aware Runtime Verification*, University of Michigan, Fall 2018
Seminar	*Evolution-Aware Runtime Verification*, George Mason University, Fall 2018
Seminar	*Evolution-Aware Runtime Verification*, Georgia Institute of Technology, Fall 2018
Guest Lecture	*Regression Testing: Challenges and Advances*, CS 598 (Reliability of Cloud-Scale Systems), UIUC, Fall 2018

Conference Talk and Tool Demo	*STARTS: STAtic Regression Test Selection*, ASE 2017, November 2017, Urbana-Champaign, IL
Poster	*STARTS: STAtic Regression Test Selection*, Huawei, October 2017, Urbana-Champaign, IL
Guest Lecture	*An Extensive Study of Static Regression Test Selection in Modern Software Evolution*, CS 527 (Topics in SE), UIUC, Fall 2017
Guest Lecture	*An Extensive Study of Static Regression Test Selection in Modern Software Evolution*, CS 498ST (Software Testing), UIUC, Fall 2017
Guest Lecture	*An Extensive Study of Static Regression Test Selection in Modern Software Evolution*, CS 427 (Software Engineering I), UIUC, Fall 2017
Guest Lecture	*An Extensive Study of Static Regression Test Selection in Modern Software Evolution*, CS 427 (Software Engineering I), UIUC, Fall 2016
Conference Talk	*An Extensive Study of Static Regression Test Selection in Modern Software Evolution*, FSE 2016, Seattle, November 2016
Poster and Tool Demo	*NonDex: A Tool for Detecting and Debugging Wrong Assumptions on Java API Specifications*, FSE 2016, Seattle, November 2016
Conference Talk	*How Good Are the Specs? A Study of the Bug-Finding Effectiveness of Existing Java API Specifications*, ASE 2016, Singapore, September 2016
Seminar Talk	*How Good Are the Specs? A Study of the Bug-Finding Effectiveness of Existing Java API Specifications*, Brett Daniel Software Engineering Seminar, UIUC, September 2016
Guest Lecture	*How Good Are the Specs? A Study of the Bug-Finding Effectiveness of Existing Java API Specifications*, CS 527 (Topics in SE), UIUC, Fall 2016
Seminar Talk	*Evolution-Aware Monitoring-Oriented Programming*, Brett Daniel Software Engineering Seminar, UIUC, September 2015
Seminar Talk	*Evolution-Aware Monitoring-Oriented Programming*, Postgraduate Seminar, CSE Department OAU, March 2015
Guest Lecture	*An Empirical Evaluation and Comparison of Manual and Automated Test Selection*, CS 527 (Topics in SE), UIUC, Fall 2014