Shravan Ravi Narayan

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Assistant Professor
University of Texas at Austin
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Education

PostDoc, *University of California, San Diego*
Ph.D., *University of California, San Diego*
B.Eng, *McGill University*, Montreal

Publications

Students I advise are <u>underlined</u>.

1. <u>T. Noh</u>, Y. Wang, T. Garfinkel, M. Madhav, M. Erez, D. Moghimi, S. Narayan. ARM MTE Performance in Practice. USENIX Security Symposium, 2026. Extended version (Arxiv).

2. S. Narayan, T. Garfinkel, E. Johnson, Z. Yedidia, Y. Wang, A. Brown, A. Vahldiek-Oberwagner, M. LeMay, W. Huang, X. Wang, M. Sun, D. Tullsen, D. Stefan. Segue & ColorGuard: Optimizing SFI Performance and Scalability on Modern Architectures. Architectural Support for Programming Languages and Operating Systems (ASPLOS), 2025.

3. S. Narayan, T. Garfinkel, M. Taram, J. Rudek, D. Moghimi, E. Johnson, C. Fallin, A. Vahldiek-Oberwagner, M. LeMay, R. Sahita, D. Tullsen, D. Stefan. Hardware-Assisted Fault Isolation: Going Beyond the Limits of Software-Based Sandboxing. IEEE Micro Top Picks, 2024.

4. S. Narayan, T. Garfinkel, M. Taram, J. Rudek, D. Moghimi, E. Johnson, C. Fallin, A. Vahldiek-Oberwagner, M. LeMay, R. Sahita, D. Tullsen, D. Stefan. Going Beyond the Limits of SFI: Flexible and Secure Hardware-Assisted In-Process Isolation with HFI. Architectural Support for Programming Languages and Operating Systems (ASPLOS), 2023.

5. E. Johnson, E. Laufer, Z. Zhao, S. Narayan, S. Savage, D. Stefan, F. Brown. WaVe: a verifiably secure WebAssembly sandboxing runtime. IEEE Symposium on Security and Privacy (S&P), 2023.

6. H. Yavarzadeh, M. Taram, S. Narayan, D. Stefan, D. Tullsen. Half&Half: Demystifying Intel's Directional Branch Predictors for Fast, Secure Partitioned Execution. IEEE Symposium on Security and Privacy (S&P), 2023.

7. S. Narayan, T. Garfinkel, E. Johnson, D. Thien, J. Rudek, M. LeMay, A. Vahldiek-Oberwagner, D. Tullsen, D. Stefan. Segue & ColorGuard: Optimizing SFI Performance and Scalability on Modern x86. Programming Languages and Analysis for Security (PLAS), 2022.

8. M. Kolosick, S. Narayan, C. Watt, M. LeMay, D. Garg, R. Jhala, and D. Stefan. Isolation without taxation: Near zero cost transitions for SFI. Principles of Programming Languages (POPL), 2022.

9. S. Narayan, C. Disselkoen, and D. Stefan. Tutorial: Using RLBox to sandbox unsafe C code. IEEE Secure Development Conference (SecDev), 2021.

10. S. Narayan, C. Disselkoen, D. Moghimi, S. Cauligi, E. Johnson, Z. Gang, A. Vahldiek-Oberwagner, R. Sahita, H. Shacham, D. Tullsen, D. Stefan. Swivel: Hardening WebAssembly against Spectre. USENIX Security Symposium, 2021.

11. E. Johnson, Y. Alhessi, D. Thien, S. Narayan, F. Brown, S. Lerner, T. McMullen, S. Savage, and D. Stefan. Доверяй, но проверяй: SFI safety for native-compiled Wasm. Network and Distributed System Security Symposium (NDSS), 2021.

12. T. Garfinkel, S. Narayan, C. Disselkoen, H. Shacham, and D. Stefan. The road to less trusted code: Lowering the barrier to in-process sandboxing. Article in USENIX ;login; journal, Winter 2020.

13. S. Narayan, C. Disselkoen, T. Garfinkel, N. Froyd, E. Rahm, S. Lerner, H. Shacham, and D. Stefan. Retrofitting fine grain isolation in the Firefox renderer. USENIX Security Symposium, 2020. Extended version (Arxiv).

14. J. Talpin, J. Marty, S. Narayan, D. Stefan, and R. Gupta. Towards verified programming of embedded devices. Invited paper at Design, Automation and Test in Europe Conference, 2019.

15. M. Smith, C. Disselkoen, S. Narayan, F. Brown, and D. Stefan. Browser history re:visited. USENIX Workshop on Offensive Technologies (WOOT), 2018.

16. F. Brown, S. Narayan, Riad S. Wahby, Dawson Engler, R. Jhala, and D. Stefan. Finding and preventing bugs in JavaScript bindings. IEEE Symposium on Security and Privacy (S&P), 2017.

Others

17. Don't Get Owned by Your Dependencies: How Firefox Uses In-process Sandboxing To Protect Itself From Exploitable Libraries. Strange Loop Conference, 2022.

18. Don't Get Owned by Your Dependencies: How Firefox Uses In-process Sandboxing To Protect Itself From Exploitable Libraries. Black Hat USA Conference, 2022.

19. S. Narayan and D. Stefan. Making software sandboxing practical using language-based techniques. Article in SIGPLAN PL Perspectives blog, Jul'21.

20. RLBox: Retrofitting fine grain isolation in the Firefox renderer. IEEE Symposium on Security and Privacy (S&P), 2021. Invited poster.

21. S. Narayan, T. Garfinkel, S. Lerner, H. Shacham, and D. Stefan. Gobi: WebAssembly as a practical path to library sandboxing. In arXiv preprint arXiv:1912.02285, Jan'19, updated Nov'19.

Awards

2025 Qualcomm faculty award. *Security, Memory Tagging and Sandboxing.*

2025 Distinguished Reviewer at ASPLOS 2025.

2024 Google research award. *Revisiting Memory Tagging for Security & Performance.*

2024 IEEE Micro Top Picks 2024. *Going beyond the Limits of SFI: Flexible and Secure Hardware-Assisted In-Process Isolation with HFI.*

2024 Honorable mention, Intel Hardware Security Academic Award 2024. *Going beyond the Limits of SFI: Flexible and Secure Hardware-Assisted In-Process Isolation with HFI.*

2023 Mozilla research award. *Investigating sandboxing of JavaScript engines.*

2023 NSF CCF # 2327337. Collaborative Research: SaTC: CORE: Medium. *Refine the Gap: Establishing Safety for Modern Foreign Function Interfaces.* $1,200,000 (total), $300,000 (UT Austin).

2023 Most engaging speaker, UT Austin Research Topics Seminar (Course CS398T).

2023 Distinguished paper award at ASPLOS 2023. *Going beyond the Limits of SFI: Flexible and Secure Hardware-Assisted In-Process Isolation with HFI.*

2023 Distinguished paper award IEEE Symposium on Security and Privacy (S&P), 2023. *WaVe: a verifiably secure WebAssembly sandboxing runtime.*

2023 Noteworthy Reviewer Award at USENIX Security Symposium 2023.

2022 Mozilla research award. *RLBox v2: Extending RLBox for more performant, ubiquitous sandboxing.*

2022 Winner, IEEE Cybersecurity Awards for Practice 2022. *Retrofitting fine grain isolation in the Firefox renderer.*

2022 Honorable mention, NSA Best Scientific Cybersecurity Paper. *Retrofitting fine grain isolation in the Firefox renderer.*

2022 Recognized contributor to the Bytecode Alliance's formal verification efforts.

2021 Finalist, Applied Research Competition, CSAW 2021. *Доверя́й, но проверя́й: SFI safety for native-compiled Wasm.*

2020 Winner, Doctoral Award for Excellence in Research, Computer Science and Eng., UC San Diego.

2020 Winner, Applied Research Competition, CSAW 2020. *Retrofitting fine grain isolation in the Firefox renderer.*

2020 Distinguished paper award at the USENIX Security Symposium 2020. *Retrofitting fine grain isolation in the Firefox renderer.*

Activities/service

Jan'26–Apr'26	Faculty recruiting committee at UT Austin Computer Science.
Aug'25–Feb'26	Program committee for the Summer cycle of the ASPLOS Conference 2026.
Nov'25–Jan'26	ACM India Doctoral Dissertation Award.
Jan'25–Apr'25	Faculty recruiting committee at UT Austin Computer Science.
Jan'25–Apr'25	PhD admissions committee at UT Austin Computer Science.
Mar'25	Reviewer in the Transactions on Dependable and Secure Computing 2025.
Mar'24–Feb'25	Program committee of the ASPLOS Conference 2025.
Sep'24	Program committee for Posters at SOSP 2024.
Sep'24	Program committee of the Applied Research Competition, CSAW 2024.
Mar'24–May'24	UT Austin Coding in the Classroom outreach to introduce Programming Robots (Lego Mindstorm) to 5th grade students.
Jan'24–Apr'24	PhD admissions committee at UT Austin Computer Science.
Dec'23	UT Austin Hour of code outreach to introduce Programming to K12 students.
Jun'23–Jun'24	Program committee of the USENIX Security Symposium 2024.
Aug'23	Program committee of the Kernel Isolation, Safety, and Verification 2023.
Jun'22–Jun'23	Program committee of the USENIX Security Symposium 2023.
Nov'22	Program committee of the Programming Languages and Analysis for Security (PLAS), 2022.
Nov'22	Mentor in GradAMP graduate application mentorship program at UC San Diego.
Oct'22	Invited participant in Consumer Reports' Memory safety convening.
Sep'22	Invited external reviewer on IEEE Symposium on Security and Privacy (S&P) 2023.
Aug'22	Program committee of the Applied Research Competition, CSAW 2022.
Jun'22	Program committee of the IEEE Secure Development Conference 2022.
Sep'21–May'22	Mentor in Early Research Scholars Program (ERSP) undergraduate research program at UC San Diego CSE department.
2019–2021	Student reviewer of papers in IEEE Symposium on Security and Privacy (S&P) 2019, ACM Symposium on Operating Systems Principles 2019, USENIX Security Symposium 2020 and 2021.

Talks

May'25	At Qualcomm Product Security Summit 2025. The Good, the Bad, and the Ugly: Flexibility & Performance in ARM MTE.
Jan'25	Keynote at Wasm Workshop 2025 (WAW) Co-located with POPL. Adventures in Making Wasm Fast and More Secure.
Oct'23	At Wasm Research Day 2023. Optimizing SFI Performance, Scalability, and Spectre Resistance on Modern CPUs.
Sept'23	At WasmCon 2023. Don't Get Owned by Dependencies: How Firefox Uses Wasm to Protect Itself from Exploitable Libraries.
Aug'23	At RISC-V Security meeting and RISC-V Runtime Integrity SIG. Going beyond the Limits of SFI: Flexible and Secure Hardware-Assisted In-Process Isolation with HFI.
June'23	At Browser Vulnerability Research Summit 2023. RLBox: How Firefox Uses In-process Sandboxing To Protect Itself From Exploitable Libraries.
May'23	At KTH Royal Institute of Technology's Software Research Meetup. Retrofitting fast and secure sandboxing in real systems.
Apr'23	At Intel Corp. Going Beyond the Limits of SFI: Flexible and Secure Hardware-Assisted In-Process Isolation with HFI.
Mar'23	At ASPLOS 2023. Going Beyond the Limits of SFI: Flexible and Secure Hardware-Assisted In-Process Isolation with HFI.
Mar'23	At Dagstuhl Seminar: Foundations of WebAssembly. Going Beyond the Limits of SFI: Flexible and Secure Hardware-Assisted In-Process Isolation with HFI.

Dec'22	At the Programming Languages and Analysis for Security (PLAS), 2022. Segue & ColorGuard: Optimizing SFI Performance and Scalability on Modern x86.
Nov'22	At UBC's graduate security class. Swivel: Hardening WebAssembly against Spectre.
Nov'22	At CMU's security class. Retrofitting fast and secure sandboxing in real systems.
Sept'22	At the Strange Loop Conference 2022. Don't Get Owned by Your Dependencies: How Firefox Uses In-process Sandboxing To Protect Itself From Exploitable Libraries.
Aug'22	At the Black Hat USA Conference 2022. Don't Get Owned by Your Dependencies: How Firefox Uses In-process Sandboxing To Protect Itself From Exploitable Libraries.
June'22	At UCSD's graduate security class. Retrofitting fast and secure sandboxing in real systems.
Oct'21	At the IEEE Secure Development Conference 2021. Using RLBox to sandbox unsafe C code.
Aug'21	At the USENIX Security Symposium 2021. Swivel: Hardening WebAssembly against Spectre.
Jul'21	At Intel Corp. Swivel: Hardening WebAssembly against Spectre.
Oct'20	At MIT's CSAIL security seminar. Retrofitting fine grain isolation in the Firefox renderer.
Oct'20	At the Center for Networked Systems' Research Review. RLBox: secure sandboxing for buggy application components.
Aug'20	At the USENIX Security Symposium 2020. Retrofitting fine grain isolation in the Firefox renderer.
Jul'20	At Brave Software, Inc. Retrofitting fine grain isolation in the Firefox renderer.

Classes

Spring 2026	Theory and Practice of Secure Systems (CS380S)
Fall 2025	Security and Privacy (CS361S)
Spring 2025	Theory and Practice of Secure Systems (CS380S)
Fall 2024	Theory and Practice of Secure Systems (CS380S)
Fall 2023	Securing real-world systems (CS395T)

Class Guest lectures

Spring 2025	How Spectre attacks work in "Advanced Computer Architecture (CS350C)"
Spring 2024	Comparing WebAssembly and VMs in "Virtualization (CS360V)"
Spring 2024	Research talk in "Intro to CS Research (CS118H)"
Fall 2024	Research talk in "Supervised Teaching in Computer Science (CS398T)"
Fall 2023	Research talk in "Supervised Teaching in Computer Science (CS398T)"
Fall 2022	Research talk in "Supervised Teaching in Computer Science (CS398T)"

Software

rlbox	A general purpose library sandboxing framework that supports sandboxing plugins.
rlbox-wasm2c	An rlbox plugin that supports using libraries sandboxed with wasm2c.
veriwasm	Sandbox validator for Cranelift WebAssembly compiler.
swivel	Spectre-resistant WebAssembly compiler.