

Steve Zdancewic

Stephan A. Zdancewic, *Curriculum Vitae*

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Department of Computer Science
University of Pennsylvania
Philadelphia, PA 19104

Education

- **Ph.D. Computer Science**
Cornell University, August, 2002.
Dissertation title: *Programming Languages for Information Security*
Advisor: Andrew C. Myers
- **M.S. Computer Science**
Cornell University, August, 2000.
- **B.S. Computer Science and Mathematics**
Carnegie Mellon University, May, 1996.

Employment

- July 2021–present:** University of Pennsylvania
Schlein Family President’s Distinguished Professor of Computer and Information Science
- July 2014–July 2021:** University of Pennsylvania
Professor of Computer and Information Science
- June 2018–Aug. 2019:** Galois
Visiting Scientist (sabbatical)
- July 2008–July 2014:** University of Pennsylvania
Associate Professor of Computer and Information Science
- December 2009–July 2010:** Cambridge Computing Laboratory, UK
Visiting researcher (sabbatical)
- September 2009–December 2009:** Microsoft Research, Cambridge, UK
Visiting researcher (sabbatical)
- July 2002–July 2008:** University of Pennsylvania
Assistant Professor of Computer and Information Science
- June–July 1999:** Lucent Technologies, Bell Labs Innovations
Summer Intern

Research Interests

- **Programming languages:** semantics, type systems, functional programming, logics, concurrency, proof assistants, mechanized metatheory
- **Security:** programming language-based security, information-flow policies, downgrading, authorization logics and policies, auditing mechanisms

Awards

Distinguished Paper Award for “Semantics of Noninterference with Interaction Trees”, ECOOP, 2023
Distinguished Paper Award for “Interaction Trees”, POPL 2020
Christian R. and Mary F. Lindback Foundation Award for Distinguished Teaching, 2018
Micro “Top Picks” paper, 2013 (joint with Santosh Nagarakatte and Milo M. K. Martin)
Alfred P. Sloan Research Fellow, 2009
NSF CAREER Award, 2004
Best paper award at the Symposium on Operating Systems Principles (SOSP), 2001
Intel Foundation Graduate Student Fellowship, 2001
Best paper award at the Conference on Principles, Logics and Implementations of High-level Programming Languages (ICFP/PPDP), 1999
NSF Graduate Student Fellowship, 1996

University Experience & Service

Post Docs Advised

Limin Jia, 2008–2009 (now Associate Research Professor of ECE at CMU)
Benôit Valiron, 2011–2013 (now Assistant Professor at CentraleSupélec)
William Mansky, 2014–2016 (now Assistant Professor of CS at University of Illinois at Chicago)
Christine Rizkallah, 2016–18 (now Lecturer in CSE at University of New South Wales)
Yannick Zakowski, 2018–2020 (now a researcher at Inria)
Lucas Silver, 2023 (now a researcher at Johns Hopkins University Applied Physics Lab)

Ph.D. Students Advised

Stephen Tse, Ph.D. August 2007. *Dynamic Security Policies*
Peng Li, Ph.D. August 2008. *Programmable Concurrency in Pure and Lazy Languages*
Jeff Vaughan, Ph.D. December 2009. *Aura: Programming with Authorization and Audit*
Karl Mazurak, Ph.D. May 2013. *Linear Types, Protocols, and Concurrency in Classical F^o*
Jianzhou Zhao, Ph.D. August 2013. *Formalizing an SSA-Based Compiler for Verified Advanced Program Transformations*
Peter-Michael Osera, Ph.D. August 2016. *Program Synthesis with Types*
Jennifer Paykin, Ph.D. June 2018. *Linear/non-linear types for embedded domain-specific languages*
Robert Rand, Ph.D. December 2018. *Formally Verified Quantum Programming*
Li-yao Xia, Ph.D. August 2022. (cosupervised by Benjamin Pierce) *Executable Denotational Semantics with Interaction Trees*
Yishuai Li, Ph.D. May 2022. (cosupervised by Benjamin Pierce) *Testing by Dualization*
Lucas Silver, Ph.D. August 2023. *Interaction Trees and Formal Specifications*
Irene Yoon, Ph.D. December 2023. *Modular Semantics and Metatheory for LLVM IR*
Calvin Beck
Paul He
Nicholas Rioux
Lawrence Dunn (cosupervised by Val Tannen)
Stephen Mell (cosupervised by Osbert Bastani)
Joey Velez-Ginorio (cosupervised by Konrad Kording)

Masters Students Advised

Solomon Maina, MSE 2020.

Dong-ho Lee, 2018-2019.
Dmitri Garbuzov, MS 2017
David Malley, MSE June 2016. *The French Press Javascript Virtual Machine*
Rohan Shah, MSE June 2014. *Type-Directed Program Synthesis with Record Types*.

Undergraduate Sr. Thesis / Sr. Projects Supervised

2023–2024: Hanxi (Gary) Chen
2022–2023: Seungmin Han and Nathan Hauglund and Aisha Olapade
2021–2022: Alexander Kassouni and Daniel Pfrommer
2018–2019: Olek Gierczak (BAS thesis)
2015–2016: Philip Del Vecchio
2015–2016: Terry Sun and Sam Rossi
2014–2015: Haolin (Kevin) Lu, Fan Yin, Yukuan Zhang
2013–2014: Ceasar Bautista, Adi Dahiya, Kyle Hardgrave, and David Xu
2012–2013: Nate Close, Amalia Hawkins, and Rupi Sureshkumar
2010–2011: Marissa Krupen (EAS 499)
2008–2009: Luke Zarko
2007–2008: Roman Shor
2006–2007: Gerraud Champion, Michael O'Connor
2004–2005: Christopher Low, Steven Richter, Paul Shied
2003–2004: Michael Christensen, Jonathan Jin, Christopher Lam, Corey Pierson
2002–2003: Robert Battle, David Kolas, Matthew Russak

Undergraduate Summer Research Experiences Supervised

Santiago Rodriguez, 2023 (REPL REU)
Lana Semenova, 2023 (REPL REU)
Riely Shahar, 2023 (REPL REU)
Eduardo Gonzalez, 2022
Zakaria Sines, 2022
Nathan Sobotka, 2022
Hanxi (Gary) Chen, 2021, 2022
Caleb Gupta, 2021
Christa Simaan, 2021
Pia Kochar, 2016
Olek Gierczak, 2017

Teaching

- **CIS 120/1200: Programming Languages and Techniques I**
University of Pennsylvania—Fall 2010, 2011, 2012, 2014, 2016, 2017, 2019, 2020, 2021, 2024 Spring 2023
A freshmen level undergraduate course that introduces the basics of programming and computer science.
- **CSE 331: Introduction to Networks and Security**
University of Pennsylvania—Fall 2002, 2003, 2004, 2006
A junior and senior level undergraduate course that introduces the fundamentals of network and computer security, basic cryptographic protocols, and secure system design.
- **CIS 341/3410: Compilers**
University of Pennsylvania—Fall 2008, Spring 2011, 2013, 2015, 2017, 2018, 2020, 2022, 2024
A junior and senior undergraduate level course that introduces compiler design and implementation.

- **CIS 500/5000: Software Foundations**
University of Pennsylvania—Fall 2013, 2022, Spring 2016
A graduate level course that covers formal logic, programming language semantics, and reasoning about software.
- **CIS 551: Computer and Network and Security**
University of Pennsylvania—Spring 2005, 2006, 2007, 2008, 2009, 2012
A graduate level course that covers software, system, and network security, including: buffer-overflow attacks, denial of service attacks, cryptographic protocols, and countermeasures.
- **CIS 670: Advanced Topics in Programming Languages: Safety and Security**
University of Pennsylvania—Spring 2003
A graduate level course on the topics of advanced language design, type systems, and program analyses as they apply to safety and security of software.
- **CIS 670: Advanced Topics in Programming Languages**
University of Pennsylvania—Spring 2021
A graduate level course on the topics of advanced language design, and type systems, concentrating on: polymorphic lambda calculus, parametricity and logical relations, linear types, and modern applications of these ideas in programming languages like Rust.
- **CIS 700: Software and Compiler Verification**
University of Pennsylvania—Fall 2005
A graduate seminar that surveyed the historic and current approaches to verifying compilation, focusing on the programming language and compiler aspects of the problem.
- **CIS 700: π -calculus and the Foundations of Concurrent Systems**
University of Pennsylvania—Spring 2004
Co-taught with Benjamin Pierce
A graduate seminar that introduced Milner’s π -calculus as a tool for studying key features of concurrent systems, including synchronization and message passing.
- **CIS 7000: Compilers**
University of Pennsylvania—Spring 2024
Experimental offering of CIS 3410 as a masters-level course.

University Service

CIS Department Associate Chair (Jan. 2017–)
SEAS QISE committee member (2022–)
Penn Prize Graduate Teaching Awards Committee Chair (2024)
Penn Prize Graduate Teaching Awards Committee (2020, 2021)
Lindback and Provost Teaching Awards Committee (2018–2020)
SEAS Faculty Council (Fall 2015–Fall 2017)
CIS Department Undergraduate Chair (Fall 2010–2014)
SEAS UAC committee (Fall 2010–2014)
CIS Department Undergraduate Curriculum Committee (2008–2018)
Managed three CIS 399 “mini courses” (Python, Unix Skills, and C/C++) taught by graduate students (2005–2008)
CIS department web pages committee (2002–2003)
Led the successful application to have Penn be designated an NSA “Center of Academic Excellence in Information Assurance”, Fall 2002.

Professional Experience & Service

Programming Languages Mentoring Workshop (steering committee chair, 2021–2023)
Chair of IFIP Working Group 2.8 (Functional Programming) (2018–2023)

ACM SIGPLAN John C. Reynolds Dissertation Awards Committee (2018–2021)
 Programming Languages Mentoring Workshop (steering committee co-chair, 2020–2021)
 Programming Languages Mentoring Workshop (@POPL 2018, @POPL 2019, steering committee)
 Editorial Board: Journal of Mathematical Structures in Computer Science (2016–)
 Co-editor of a Special Issue in the Journal of Computer Security on *Computer Security Foundations*
 Summer School Co-organizer: ExCAPE Summer School on Program Synthesis, 2013, 2015
 Co-editor of a Special Issue of the Journal of Computer Security, 2014–2015.
 ACM SIGPLAN Executive Committee Member at Large, 2007–2009
 Steering Committee: Oregon Summer School on Programming Languages, 2005–present
 New Jersey Programming Languages Seminar organizer, 2005–2010
 Tutorial organizer: *Using Proof Assistants for Programming Language Research or, How to write your next POPL paper in Coq* (with B. Pierce and S. Weirich). Jan 2008.
 Co-editor of a Special Issue of the Journal of Information and Computation on *Computer Security: Foundations and Automated Reasoning*, 2007
 Workshop organizer: ACM Workshop on Mechanizing Metatheory (with Pierce and Weirich), 2006, 2007.
 Co-organizer (with David Walker): Summer School on Reliable and Fault Tolerant Software: July, 2005.
 Co-organizer (with Benjamin Pierce, Stephanie Weirich, and Penn graduate students) for the 7th annual ICFP programming competition, 2004.
 Co-organizer (with David Walker): Summer School on Software Security, June 17–25, 2004
 Journal Reviewing: Foundations and Trends in Programming Languages, Journal of Automated Reasoning, Higher Order Symbolic Computation, Journal of Computer Security, Journal of Functional Programming, Information Processing Letters, ACM Transactions on Programming Languages and Systems, ACM Transactions on Computer Systems, IEEE Transactions on Computers, ACM Transactions on Information System Security, Information and Computation
 Conference Reviewing: ACM: ICFP, OOPSLA, POPL, PLDI, SOSP, LCTES; IEEE: Security and Privacy, CSFW; USENIX OSDI; ICALP; ECOOP; FCS; ESOP

Conference and Program Committee Work

- ACM SIGPLAN POPL 2025 General Chair
- Program Committee Associate Chair POPL 2024
- Program Co-Chair: Certified Programs and Proofs (CPP), 2022 & 2023
- Co-organizer of the Programming Languages Mentoring Workshop (PLMW) @ POPL, 2019
- Co-organizer of the Deep Specifications at PLDI Workshop, 2018
- Co-organizer of the Programming Languages Mentoring Workshop (PLMW) @ POPL, 2018
- Program Chair: IEEE Computer Security Foundations Symposium, 2012
- Program Co-Chair: IEEE Computer Security Foundations Symposium, 2011
- Program Co-Chair: Foundations of Computer Security (FCS-ARSPA) 2007
- Program Co-Chair: Foundations of Computer Security (FCS-ARSPA) 2006
- Program Chair: Programming Languages and Analysis for Security (PLAS) 2006
- Program Chair: New Jersey Programming Languages Seminar, September 2003
- Program Committees:
 - Program Committee Member International Conference on Code Quality 2024 (ICCQ24)
 - International Conference on Functional Programming (ICFP) 2021
 - Principles of Programming Languages (POPL) 2020
 - Formal Structures for Computation and Deduction (FSCD) 2020
 - International Workshop on Coq for Programming Languages (CoqPL) 2019
 - Workshop on Software debloating and Delayering (SALAD) 2018
 - Programming Languages Design and Implementation (PLDI) External Review Committee 2018
 - European Symposium on Programming (ESOP 2018)

Certified Programs and Proofs (CPP 2017)
 Programming Languages Design and Implementation (PLDI) External Review Committee 2017
 European Symposium on Programming (ESOP 2017) [guest reviewer]
 Computer Security Foundations (CSF 2016)
 Mathematical Foundations of Program Semantics (MFPS 2016)
 CoqPL 2016
 Implementation and application of functional programming languages (IFL 2015)
 4th Workshop on Synthesis (SYNT 2015)
 OOPSLA External Review Committee 2014
 Programming Languages Design and Implementation (PLDI) External Review Committee 2014
 International Colloquium on Automata, Languages, and Programming (ICALP) 2014
 European Symposium on Programming (ESOP) 2014
 International Symposium on Engineering Secure Software and Systems (ESSOS) 2014
 Implementation and Application of Functional Languages (IFL) 2012
 Programming Language Design and Implementation (PLDI) 2012
 Hot Topics in Security (HotSEC) 2011
 Principles of Programming Languages (POPL) 2011
 European Symposium on Programming (ESOP) 2010
 Theory and Practice of Provenance (TAPP) 2009
 IEEE Symposium on Security & Privacy (Oakland) 2009
 Formal Methods in Security Engineering (FMSE) 2008
 Principles of Programming Languages (POPL) 2008
 IEEE Symposium on Security & Privacy (Oakland) 2008
 Hot Topics in Security (HotSec) 2007
 Workshop on Mechanized Metatheory (WMM) 2007
 Computer Security Foundations Symposium (CSF) 2007
 Mathematical Foundations of Program Semantics (MFPS) 2007
 International Conference on Functional Programming (ICFP) 2006
 Programming Languages and Analysis for Security (PLAS) 2006
 Formal Methods in Security Engineering (FMSE) 2006
 PASSWORD 2006
 Languages, Compilers, and Tools for Embedded Systems (LCTES) 2005
 Computer Security Foundations Workshop (CSFW) 2005
 Mathematical Foundations of Program Semantics (MFPS) 2005

Research Experience and Funding

Grants (bold text indicates those for which I am lead PI)

- **NSF SaTC: CORE: Medium: Secure and Formally-verified Low-level Languages \$1.2M 2023-2027, Steve Zdancewic PI**
- **NSF REU Site: Research Experience for undergraduates in Programming Languages (REPL) \$322,095 2023-2026, Steve Zdancewic PI**
- **ONR "Accountable Protocol Customization" \$7.5M (2019–2024) Boon Thau Loo (Co-PI) Benjamin Pierce (Co-PI) Andre Scedrov (Co-PI) plus others at Stanford and CMU, (Penn's portion is \$2.5M)**

- **ONR “REVOLVER: Recurrent EVOLution and Verification of Encapsulated Rights” \$853,600 (9/2017–2020), N00014-17-1-2930, Jonathan Smith (Co-PI)**
- DARPA: “Synthesizing Data Wranglers.” \$450,000 (2016). (Penn’s portion is \$145k), David Walker (Princeton), Kathleen Fisher (Tufts), Benjamin Pierce (PI), Steve Zdancewic (Co-PI)
- ARL MURI “SynCrypt: Automated Synthesis of Cryptographic Constructions.”, Andre Scedor (PI), Steve Zdancewic (Co-PI) (12/2015–2017)
- ONR MURI “Semantics, Formal Reasoning, and Tool Support for Quantum Programming”, Mike Mislove (Tulane) (PI), (12/2015–2017)
- NSF “Collaborative Research: Expeditions in Computing: The Science of Deep Specification”, NSF-1521539 \$10M (Penn’s portion \$3.35M) (12/15–11/20)
- **NSF CISE SHF Small: Nonstandard Computational Models of Linear Logic. NSF-1421193 Steve Zdancewic (PI). \$500,000 (09/14–09/17)**
- NSF “XPS: CLCCA: Improving Parallel Program Reliability Through Novel Approaches To Precise Data Race Detection”, NSF-1337174. University of Pennsylvania PI: Joseph Devietti, Co-PI Steve Zdancewic and Milo Martin \$700,000 (09/13 – 08/17)
- DARPA “Mission-Oriented Resilient Cloud Program (Mrc)”, University of Pennsylvania PI: Jonathan Smith, Co-PI Steve Zdancewic (and others) \$471,837 (09-11 – 09/15)
- NSF “Expeditions in Computer Augmented Program Engineering: ExCAPE: Harnessing Synthesis for Software Design”, NSF-1064279. University of Pennsylvania PI: Rajeev Alur, Co-PI Steve Zdancewic (and others) \$3.75m (07/11 – 6/14)
- NSF “Watchdog: Hardware-assisted Prevention of All Use-After-Free Security Vulnerabilities”, TC-1116682. University of Pennsylvania PI: Milo Martin, Co-PI: Steve Zdancewic \$500,000 (08/11 – 07/14)
- ONR “IRONCLAD C/C++: Enforcing Memory Safety to Prevent Low-level Security Vulnerabilities”, N00014-11-1-0596. University of Pennsylvania PI: Milo Martin, Co-PI: Steve Zdancewic \$349,000 (04/11 – 04/14)
- **NSF “Validating Program Transformations in a Mechanized LLVM”, CCF-1065166. University of Pennsylvania PI: Steve Zdancewic \$808,961 (07/11 – 07/15)**
- IARPA “Quantum Computer Science Program”, Sub on proposal in resp. to IARPA BAA-10-02. University of Pennsylvania PI: Jonathan M. Smith, Co-PI: Steve Zdancewic \$508,318 total DC&IC. (1/11 – 06/13)
- **NSF “Practical Linear Types for Safe Protocols” CCF-1017027. University of Pennsylvania PI: Steve Zdancewic. \$500,000 (09/10 – 09/13)**
- ONR Networks Opposing Botnets, PI: Jonathan Smith with B. Pierce, S. Zdancewic, B. Loo, S. Weirich (Penn) E. Felton, J. Rexford, D. Walker (Princeton) G. Morrisett, M. Welsh (Harvard), 2009-2012
- DARPA CS Study Group Phase 2 “Machine-checked Metatheory for Security-oriented Languages”. University of Pennsylvania PI: Stephanie Weirich, Co-PI: Steve Zdancewic. \$500,000 (5/08 – 4/10)
- NSF “CT-T: Collaborative Research: Manifest Security” CCF-0716469. University of Pennsylvania PI: Benjamin Pierce, Co-PIs: Stephanie Weirich, Steve Zdancewic. Carnegie Mellon University PI: Frank Pfennig, Co-PIs: Karl Cray, Robert Harper. \$1M (9/07 – 9/09)
- **NSF “CCF: Unifying Events and Threads: Language Support for Network Services” CCF-0541040. University of Pennsylvania PI: Steve Zdancewic. \$350,000 (8/06 – 7/09)**

- NSF “CRI: Machine Assistance for Programming Language Research” CNS-0551589. University of Pennsylvania PI: Stephanie Weirich, Co-PIs: Benjamin Pierce, Steve Zdancewic. \$200,000 (3/06 – 2/08)
- NSF “CT-T: Collaborative Research: Flexible, Decentralized Information-flow Control for Dynamic Environments” CCF-0524035. University of Pennsylvania PI: Steve Zdancewic, University of Maryland, College Park PI: Michael Hicks, Pennsylvania State University PI: Patrick McDaniel, University of Texas, San Antonio PI: William Winsborough. \$1.2M (9/05 – 8/08)
- NSF “CT-T: Resource-Guided Implementation of Secure Embedded Software” CNS-0524059. University of Pennsylvania PI: Steve Zdancewic, Co-PIs: Rajeev Alur, Andre Scedrov. \$1M (8/05 – 8/07)
- NSF “CAREER: Language-based Distributed System Security.” CNS-0346939. University of Pennsylvania PI: Steve Zdancewic. \$400,000 (6/04 – 5/09)
- NSF “Dynamic Security Policies.” CCR-0311204. University of Pennsylvania PI: Steve Zdancewic. \$300,000 (8/03 – 7/05)
- NSF “Software Security: Theory to Practice.” CCF-0438714. University of Pennsylvania PI: Steve Zdancewic, University of Oregon, PI: Zena Ariola, Princeton University, PI: David Walker. \$10,000 (8/04 – 1/05)

Invited Talks and Technical Presentations

1. *Vellom: Verifying LLVM IR Code*, Reed College, 5 Mar. 2024
2. *Vellom: Verifying LLVM IR Code*, University of Illinois at Chicago, 11 Dec. 2020
3. *Termination-Sensitive Program Specifications (Reasoning About Interaction Trees)*, IFIP Working Group 2.8 (Functional Programming), 9–13 March 2020
4. *Vellom: Verifying LLVM IR Code*, School of Computer and Cyber Sciences Colloquium, Augusta University, 14 Feb. 2020
5. *Interaction Trees: Representing Recursive and Impure Programs in Coq*, DeepSpec Workshop Invited Talk, 23 June 2019
6. *Compositional Compiler Correctness in Coq*, IFIP Working Group 2.8 (Functional Programming), 20–24 May 2019
7. *Verified Software Correctness - The Science of Deep Specification*, University of Pennsylvania Lindback Lecture for the Philomathean Society, 21 Mar. 2019
8. *Vellom – Verifying the LLVM*. StrangeLoop. St. Louis, MO. 28 Sept. 2018.
9. *Vellom – Verifying the LLVM*. Dagstuhl Seminar on Secure Compilation. Wadern, Germany. 15 May 2018.
10. *Vellom – Verifying the LLVM*. 4th International Conference on Tools and Methods of Program Analysis, TMPA-2017, (Keynote) Moscow, Russia. 3–4 Mar. 2017,
11. *Vellom II: Semantics and Verification for LLVM*, Principles in Practice (PiP), 21 Jan. 2017
12. *SSA \subseteq CBPV* IFIP Working Group 2.8 (Functional Programming), 17–22 July. 2016.
13. *Type- and Example-Driven Program Synthesis*. Symp. on TFP (Keynote) 8–10 Jun. 2016.
14. *Vellom: A Verified LLVM*. At the Mathematical Foundations of Program Semantics, 23–26 May 2016.
15. *Curry-Howard for GUIs: classical linear temporal logic* IFIP Working Group 2.8, 14–29 May. 2015.
16. *Vellom: Verifying Safety in the LLVM IR* Max Planck Institute, 9 Oct. 2014.
17. *Vellom: Verifying Transformations of the LLVM IR* Reliably Secure Software Systems (RS³) Annual Meeting Keynote Talk, 8 Oct. 2014
18. *Type- and Example-Driven Program Synthesis* Chalmers University, 6 Oct. 2014.
19. *Type- and Example-Driven Program Synthesis* IFIP Working Group 2.8, 12 Aug. 2014.
20. *Vellom: Verifying Transformations of the LLVM IR* Certification of High- and Low-level Programs Workshop, 7–10 July 2014.
21. *Vellom: Verifying Transformations of the LLVM IR* IFIP Working Group 2.8, 14 Oct. 2013.

22. *Vellom: Verifying Transformations of the LLVM IR Syntax and Semantics of Low-Level Languages (LOLA)*, 29 Jun. 2013.
23. *Linear Logic and Linear Algebra*. IFIP Working Group 2.8, 1 Nov. 2012.
24. *Mechanized Verification of Computing Dominators for Formalizing Compilers*. Certified Programs and Proofs. 13 Dec. 2012.
25. *Why Information-flow is Different From—and harder than—Verifying other kinds of Properties* NSF/CCC Workshop about Semiconductor Verification. 15 Jan. 2013.
26. *Work–Life Balance for Computer Scientists*. Programming Languages Mentoring Workshop , Philadelphia, PA. 24 Jan. 2012
27. *Protocol Types in a Classical Linear Logic*, Chalmers University Security Workshop, Gothenburg, Sweden. 29 Aug. 2011.
28. *Protocol Types in a Classical Linear Logic*, Mathematical Foundations of Program Semantics (MFPS) , Pittsburgh, PA. 27 May 2011.
29. *Lightweight Linear F*, School of Informatics, University of Edinburgh, Scotland. 20 Jul. 2010.
30. *AURA: A programming language with authorization and audit*, INRIA . 14 Jun. 2010.
31. *AURA: A programming language with authorization and audit*, Strathclyde University. 29 Apr. 2010.
32. *AURA: A programming language with authorization and audit*, Cambridge Computing Laboratory Wednesday Seminar. 10 Mar. 2010.
33. *F^o: Lightweight Linear F*, Cambridge Computing Labs Semantics Lunch. 12 Oct. 2009.
34. *AURA: A programming language with authorization and audit*, CUNY CS Colloquium. 12 Mar. 2009.
35. *AURA: A programming language with authorization and audit*, University of Iowa CS Colloquium. 21 Nov. 2008.
36. *AURA: A programming language with authorization and audit*, IFIP Working Group 2.8 (Functional Programming). Park City, Utah. 18 June 2008.
37. *AURA: A programming language with authorization and audit*, High Confidence Software and Systems Conference (HCSS). Maritime Institute. Linthicum, Maryland. 7 Mar. 2008
38. *Application-level concurrency in Haskell: Combining Events and Threads*, Cornell University CS Colloquium. Ithaca, NY. 11 Oct. 2007.
39. *Combining Access Control and Information Flow in DCC*, IFIP Working Group 2.8 (Functional Programming). Iceland. 17 Jul. 2007.
40. *Combining Access Control and Information Flow in DCC*, Dagstuhl Seminar on Mobility, Ubiquity and Security. Wadern, Germany. 26 Feb. 2007.
41. *Application-level Concurrency: Combining Events and Threads*, Declarative Aspects of Multicore Programming (DAMP). Nice, France. 16 Jan. 2007.
42. *Dynamic Information-Flow Policies in Java 5*, IBM T.J. Watson Research Center. 10 Jan. 2007
43. *Encoding Information Flow in Haskell*, IFIP Working Group 2.8 (Functional Programming). Boston, Massachusetts. 17 Jul. 2006.
44. *Encoding Information Flow in Haskell*, Mathematical Foundations of Program Semantics (MFPS) . Genoa, Italy. 26 May 2006.
45. *Encoding Information Flow in Haskell*, Department of CS, Chalmers University 22 May 2006.
46. *Language-based Information Security*, Computer Information Assurance and Security Invited Talk Series. University of Texas, San Antonio. 16 Dec. 2005.
47. *Deriving Noninterference Results from Parametricity*, Mathematical Foundations of Program Semantics (MFPS). Birmingham, England. 19 May 2005.
48. *Language Based Security and Secure Program Partitioning*, Department of Computer Science Seminar. University of Massachusetts, Amherst, Massachusetts. 15 Nov. 2004.
49. Keynote address: *Programming Language Tools for Security*, First ACM Workshop on Business Driven Security Engineering (BIZSEC), Fairfax Virginia. 31 Oct. 2003.
50. *Dynamic Principals and the Decentralized Label Model*, Dagstuhl Seminar on Language-based Security, Schloss Dagstuhl, Germany. 6 Oct. 2003.
51. *Jif and Secure Program Partitioning*, City University of NY Graduate Center. 25 Sept. 2003.

52. *Information Flow Security*, Stevens Institute of Technology Laboratory for Secure Systems Seminar, 10 April 2003.
53. *Programming Languages for Information Security*, [A job interview talk] presented at: Oregon Graduate Institute, University of Oregon, University of Pennsylvania, University of Virginia, Northeastern University, Harvard University, University of California, San Diego, University of Michigan, Purdue University, University of Texas at Austin, Rice University, University of Maryland, MIT, University of Colorado, Boulder, Pennsylvania State University.
54. *A Syntactic Account of Type Abstraction*, CMU's Principles of Programming seminar, 6 Nov. 1998.

Lecture Series / Invited Workshop Talks

1. *Formal Verification of Monadic Computations*, Summer School on Types, Logic and Verification, University of Oregon, Eugene Oregon. July 2022.
2. *Vellvm: Verifying the LLVM*, DeepSpec Summer School, University of Pennsylvania, Philadelphia Pennsylvania July 2017.
3. *Verifying LLVM Optimizations in Coq*, Summer School on Types, Logic and Verification, University of Oregon, Eugene Oregon. August 2013.
4. *Language-based Security*, International School on Foundations of Security Analysis and Design (FOSAD), Bertinoro, Italy. August 2008.
5. *Three Lectures on Stack Inspection and the Java Security model*, Summer School on Software Security: Theory to Practice, University of Oregon, Eugene Oregon. June 2004.
6. *Three Lectures on Language-based Information Flow Security*, Summer School on Foundations of Security, University of Oregon, Eugene Oregon. 24 & 25 June 2003.

Open Source Software

1. The Vellvm - Verified LLVM IR project <https://github.com/vellvm/vellvm>
2. Interaction Trees Library <https://github.com/DeepSpec/InteractionTrees>

Publications

Journal Papers

1. Stephen Mell, Steve Zdancewic, and Osbert Bastani. Optimal program synthesis via abstract interpretation. 8(POPL), 2024.
2. Nick Rioux, Xuejing Huang, Bruno C. d. S. Oliviera, and Steve Zdancewic. A Bowtie for a Beast: Overloading, Eta Expansion, and Extensible Data Types in $F\bowtie$. *Proceedings of the ACM on Programming Languages*, 7(POPL), 2023.
3. Nicolas Chappe, Paul He, Ludovic Henrio, Yannick Zakowski, and Steve Zdancewic. Choice trees: Representing nondeterministic, recursive, and impure programs in coq. *Proceedings of the ACM on Programming Languages*, 7(POPL), 2023.
4. Irene Yoon, Yannick Zakowski, and Steve Zdancewic. Formal reasoning about layered monadic interpreters. *Proceedings of the ACM on Programming Languages*, 6(ICFP), 2022.

5. Mohsen Lesani, Li-Yao Xia, Anders Kaseorg, Christian J. Bell, Adam Chlipala, Benjamin C. Pierce, and Steve Zdancewic. C4: Verified transactional objects. *Proceedings of the ACM on Programming Languages*, OOPSLA, 2022.
6. Paul He, Eddy Westbrook, Brent Carmer, Chris Phifer, Valentin Robert, Karl Smeltzer, Andrei Andrei Ștefănescu, Aaron Tomb, Adam Wick, Matthew Yacavone, and Steve Zdancewic. A type system for extracting functional specifications from memory-safe imperative programs. *Proceedings of the ACM on Programming Languages*, OOPSLA, 2021.
7. Yannick Zakowski, Calvin Beck, Irene Yoon, Ilya Zaichuk, Vadim Zaliva, and Steve Zdancewic. Modular, compositional, and executable formal semantics for llvm ir. *Proceedings of the ACM on Programming Languages*, 5(ICFP), 2021.
8. Lucas Silver and Steve Zdancewic. Dijkstra monads forever: Termination-sensitive specifications for interaction trees. *Proceedings of the ACM on Programming Languages*, 5(POPL), January 2021.
9. Nick Rioux and Steve Zdancewic. Computation focusing. *Proceedings of the ACM on Programming Languages*, 5(ICFP), 2020.
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Highly Selective Conference and Workshop Papers

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2. Lawrence Dunn, Val Tannen, and Steve Zdancewic. Syntax monads for the working formal metatheorist. In *Proceedings of the 6th International Conference on Applied Category Theory (ACT)*, 2023.
3. Stephen Mell, Favyen Bastani, Steve Zdancewic, and Osbert Bastani. Synthesizing trajectory queries from examples. In *Computer Aided Verification - 35th International Conference, CAV, 2023*.
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5. Stephen Mell, Osbert Bastani, and Steve Zdancewic. Ideograph: A language for expressing and manipulating structured data. In *Proceedings Twelfth International Workshop on Computing with Terms and Graphs (TERMGRAPH 2022)*, pages 65–84. Electronic Proceedings in Theoretical Computer Science, 2022.
6. George Tolkachev, Stephen Mell, Steve Zdancewic, and Osbert Bastani. Counterfactual explanations for natural language interfaces. In *60th Annual Meeting of the Association for Computational Linguistics (ACL)*, 2022. (short paper).
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9. Yannick Zakowski, Paul He, Chung-Kil Hur, and Steve Zdancewic. An equational theory for weak bisimulation via generalized parameterized coinduction. In *Proceedings of the 9th ACM SIGPLAN International Conference on Certified Programs and Proofs (CPP)*, January 2020.
10. Jennifer Paykin and Steve Zdancewic. A HoTT Quantum Equational Theory. In *The 16th International Conference on Quantum Physics and Logic (QPL)*, 2019. extended version available on arXiv.
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12. Nicolas Koh, Yao Li, Yishuai Li, Li yao Xia, Lennart Beringer, Wolf Honoré, William Mansky, Benjamin C. Pierce, and Steve Zdancewic. From C to Interaction Trees: Specifying, Verifying, and Testing a Networked Server. In *Proceedings of the 8th ACM SIGPLAN International Conference on Certified Programs and Proofs (CPP)*, January 2019.
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1. Steve Zdancewic. Challenges for Information-flow Security. In *Proceedings of the 1st International Workshop on the Programming Language Interference and Dependence (PLID'04)*, 2004. (5 pages).
2. Steve Zdancewic. A Type System for Robust Declassification. In *Proceedings of the Nineteenth Conference on the Mathematical Foundations of Programming Semantics (MFPS)*. Electronic Notes in Theoretical Computer Science, March 2003. (16 pages).

Refereed Workshop Papers

1. Neelakantan R. Krishnaswami, Jennifer Paykin, and Steve Zdancewic. Curry-howard for guis. In *POPL Off the Beaten Track (OBT)*, 2015.
2. Jennifer Paykin and Steve Zdancewic. A linear/producer/consumer model of classical linear logic (extended abstract). In *Third International Workshop on Linearity, LINEARITY*, 2014.
3. Peter-Michael Osera, Vilhelm Sjöberg, and Steve Zdancewic. Dependent inoperability. In *The Sixth ACM SIGPLAN Workshop on Programming Languages meets Program Verification (PLPV)*, 2012.
4. Karl Mazurak, Jianzhou Zhao, and Steve Zdancewic. Lightweight linear types in System F°. In *ACM SIGPLAN International Workshop on Types in Languages Design and Implementation (TLDI)*, pages 77–88, 2010.
5. Michael J. May, Carl A. Gunter, Insup Lee, and Steve Zdancewic. Strong and weak policy relations. In *POLICY 2009, IEEE International Symposium on Policies for Distributed Systems and Networks*, pages 33–36, 2009.
6. Limin Jia and Steve Zdancewic. Encoding information flow in Aura. In *Proceedings of the 2009 Workshop on Programming Languages and Analysis for Security (PLAS)*, pages 17–29, 2009.
7. Karl Mazurak and Steve Zdancewic. ABash: Finding bugs in bash scripts. In *ACM SIGPLAN Workshop on Programming Languages and Analysis for Security (PLAS)*, June 2007.

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11. Usa Sammapun, Raman Sharykin, Margaret Delap, Myong Kim, and Steve Zdancewic. Formalizing Java-MaC. In *Proceedings of the Third Runtime Verification Workshop*, pages 171–190. Electronic Notes in Theoretical Computer Science, July 2003.
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Technical Reports, Works in Progress, and Unpublished Manuscripts

1. Jennifer Paykin and Steve Zdancewic. A HoTT Quantum Equational Theory (Extended Version). available on arXiv, 2019.
2. Jennifer Paykin and Steve Zdancewic. A linear/producer/consumer model of classical linear logic. Technical report, University of Pennsylvania, 2014.
3. Christian DeLozier, Richard Eisenberg, Santosh Nagarakatte, Peter-Michael Osera, Milo M.K. Martin, and Steve Zdancewic. Ironclad C++: A library-augmented type-safe subset of C++. Technical Report MS-CIS-13-05, University of Pennsylvania, March 2013.
4. Jianzhou Zhao, Qi Zhang, and Steve Zdancewic. Relational parametricity for polymorphic linear lambda calculus (extended tr). 2010.
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7. Stephen Tse and Steve Zdancewic. Concise concrete syntax. Technical Report MS-CIS-08-11, University of Pennsylvania, 2008.
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