Gordon Stewart

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EDUCATION

2015	Ph.D. in Computer Science	Princeton University
2011	M.A. in Computer Science	Princeton University
2006	A.B. *magna cum laude* in Classics	Harvard University

APPOINTMENTS

Aug. 2015–present	Ohio University, Athens, OH, USA	Assistant Professor
Apr. 2015–Jul. 2015	Princeton University, Princeton, NJ, USA	Postdoctoral Researcher
Summer 2013	Microsoft Research, Cambridge, UK	Research Intern
Summer 2011	IMDEA Software, Madrid, Spain	Research Intern

GRANTS

2018–2019	Research Experience for Undergraduates Supplement, NSF (PI, $16k)
2017–2019	CRII: SHF: Distributed Systems With Verified Complexity By Design, NSF (PI, $174k)
2017–2019	Intelligent Channel Sensing, Ohio Federal Research Network (Co-PI, $99k)

RESEARCH AREAS

Programming languages, software verification, software security

SELECTED PUBLICATIONS

Journals and Refereed Conference Proceedings

AAAI'19 Alexander Bagnall and Gordon Stewart. Certifying the True Error: Machine Learning in Coq with Verified Generalization Guarantees. In *Proceedings of the Thirty-Third AAAI Conference on Artificial Intelligence*. AAAI Press (to appear), 2019.

TCAD'18 Seaghan Sefton, Taiman Siddiqui, Nathaniel St. Amour, Gordon Stewart, and Avinash Kodi. GARUDA: Designing energy-efficient hardware monitors from high-level policies for secure information flow. *ESWEEK/CASES special internet-only issue of IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD)*, 2018.

ESOP'18 Samuel Merten, Alexander Bagnall, and Gordon Stewart. Verified learning without regret. In *Proceedings of the 27th European Symposium on Programming (ESOP)*, 2018.

PADL'18 Gordon Stewart, Samuel Merten, and Logan Leland. Snaarkl: Somewhat practical, pretty much declarative verifiable computing in haskell. In *Proceedings of the 20th International Symposium on Practical Aspects of Declarative Languages*, 2018.

JFR'17 Alexander Bagnall, Samuel Merten, and Gordon Stewart. A library for algorithmic game theory in Ssreflect/Coq. *Journal of Formalized Reasoning*, 2017.

PODC'17 Alexander Bagnall, Samuel Merten, and Gordon Stewart. Brief announcement: Certified multiplicative weights update. In *Proceedings of the 36th ACM Symposium on Principles of Distributed Computing (PODC)*, 2017.

AIAA'16 Harsha Chenji, Gordon Stewart, Zhiqiang Wu, Ahmad Javaid, Vijay Devabhaktuni, Kul Bhasin, and Bin Wang. An architecture concept for cognitive space communication networks. In *Proceedings of the 34th AIAA International Communications Satellite Systems Conference*, 2016.

ASPLOS'15 Gordon Stewart, Mahanth Gowda, Geoffrey Mainland, Bozidar Radunovic, Dimitrios Vytiniotis, and Cristina Luengo Agullo. Ziria: A DSL for wireless systems programming. In *Proceedings of the 20th International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS)*, March 2015.

POPL'15 Gordon Stewart, Lennart Beringer, Santiago Cuellar, and Andrew W. Appel. Compositional CompCert. In *Proceedings of the 42nd ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages (POPL)*, January 2015.

CSF'14 Joshua Kroll, Gordon Stewart, and Andrew W. Appel. Portable software fault isolation. In *Proceedings of the 27th IEEE Computer Security Foundations Symposium (CSF)*, July 2014.

ESOP'14 Lennart Beringer, Gordon Stewart, Robert Dockins, and Andrew W. Appel. Verified compilation for shared-memory C. In *Proceedings of the 23rd European Symposium on Programming (ESOP)*, April 2014.

CPP'13 Gordon Stewart. Computational verification of network programs in Coq. In *Proceedings of the 3rd International Conference on Certified Programs and Proofs (CPP)*, December 2013.

PPDP'13 Gordon Stewart, Anindya Banerjee, and Aleksandar Nanevski. Dependent types for enforcement of information flow and erasure policies in heterogeneous data structures. In *Proceedings of the 15th International Symposium on Principles and Practice of Declarative Programming (PPDP)*, September 2013.

ICFP'12 Gordon Stewart, Lennart Beringer, and Andrew W. Appel. Verified heap theorem prover by paramodulation. In *Proceedings of the 17th ACM SIGPLAN International Conference on Functional Programming (ICFP)*, pages 3–14. ACM, 2012.

JCDL'07 Gordon Stewart, Gregrory Crane, and Allison Babeu. A new generation of textual corpora: Mining corpora from very large collections. In *Proceedings of the 7th ACM/IEEE-CS Joint Conference on Digital Libraries (JCDL)*. ACM, 2007.

Theses and Books

Princeton'15 Gordon Stewart. *Verified Separate Compilation for C*. Ph.D. Thesis, Princeton University, April 2015. Advisor: Andrew W. Appel.

CUP'14 Andrew W. Appel, Robert Dockins, Aquinas Hobor, Lennart Beringer, Josiah Dodds, Gordon Stewart, Sandrine Blazy, and Xavier Leroy. *Program Logics for Certified Compilers*. Cambridge University Press, 2014.

Refereed Workshop Proceedings

MAPL'17 Charlie Murphy, Patrick Gray, and Gordon Stewart. Verified perceptron convergence theorem. In *Proceedings of the First ACM SIGPLAN Workshop on Machine Learning and Programming Languages (MAPL)*, 2017.

PLPV'11 Gordon Stewart and Andrew W. Appel. Local actions for a Curry-style operational semantics. In *Proceedings of the 5th ACM Workshop on Programming Languages Meets Program Verification (PLPV)*, pages 31–42. ACM, 2011.

Demos, Posters, and Extended Abstracts

MobiCom'14 Mahanth Gowda, Gordon Stewart, Geoffrey Mainland, Bozidar Radunovic, and Dimitrios Vytiniotis. Poster – Ziria: language for rapid prototyping of wireless PHY. In *Proceedings of the 20th Annual International Conference on Mobile Computing and Networking (MobiCom)*, September 2014.

SIGCOMM'14 Gordon Stewart, Mahanth Gowda, Geoffrey Mainland, Bozidar Radunovic, Dimitrios Vytiniotis, and Doug Patterson. Ziria: Language for rapid prototyping of wireless PHY (demo paper). In *ACM SIGCOMM*, August 2014.

SRIF'14 Gordon Stewart, Mahanth Gowda, Geoffrey Mainland, Bozidar Radunovic, and Dimitrios Vytiniotis. Demo: 802.11 a/g PHY implementation in Ziria, domain-specific language for wireless programming. In *Proceedings of the ACM SIGCOMM Software Radio Implementation Forum (SRIF)*, August 2014.

LOLA'13 Lennart Beringer, Gordon Stewart, Robert Dockins, and Andrew W. Appel. Towards verified shared-memory cooperation for C (*extended abstract*). In *Syntax and Semantics of Low-Level Languages (LOLA)*, June 2013.

Technical Reports and Unrefereed Conference Proceedings

arXiv'17 Alexander Bagnall, Razvan Bunescu, and Gordon Stewart. Training ensembles to detect adversarial examples. *arXiv:1712.04006 [cs.LG]*, 2017.

AIAA'16 Harsha Chenji, Gordon Stewart, Zhiqiang Wu, Ahmad Javaid, Vijay Devabhaktuni, Kul Bhasin, and Bin Wang. An architecture concept for cognitive space communication networks. In *Proceedings of the 34th AIAA International Communications Satellite Systems Conference*, 2016.

NAECON'16 Z. Zhang, Z. Wu, H. Chenji, J. Stewart, A. Javaid, V. Devabhaktuni, K. Bhasin, and B. Wang. Intelligent channel sensing based secure cross layer cognitive networking for resilient space communication. In *2016 IEEE National Aerospace and Electronics Conference (NAECON) and Ohio Innovation Summit (OIS)*, pages 407–411, July 2016.

MSR'13 Gordon Stewart, Mahanth Gowda, Geoffrey Mainland, Bozidar Radunovic, and Dimitrios Vytiniotis. Ziria: Wireless programming for hardware dummies. Technical report, MSR, November 2013.

INRIA'12 Xavier Leroy, Andrew W. Appel, Sandrine Blazy, and Gordon Stewart. The CompCert memory model, version 2. Research report, INRIA, June 2012.

TALKS

Conference and Workshop Talks

2018 *Machine-Verified Machine Learning (lightning talk).* DeepSpec Workshop, co-located with PLDI, Philadelphia, Pennsylvania, June 19.

2018 *Snaarkl: Somewhat Practical, Pretty Much Declarative Verifiable Computing in Haskell.* Practical Aspects of Declarative Languages, Los Angeles, California, January 8.

2017 *Certified Multiplicative Weights Update, or Verified Learning Without Regret.* The 17th Annual High Confidence Software and Systems Conference, Annapolis, MD, May 10.

2015 *Compositional CompCert.* POPL, Mumbai, January 16.

2013 *Computational Verification of Network Programs in Coq.* Certified Programs and Proofs (CPP), Melbourne, December 11.

2013 *Dependent Types for Enforcement of Erasure Policies in Heterogeneous Data Structures.* Principles and Practice of Declarative Programming (PPDP), Madrid, September 17.

2012 *Heap Theorem Prover by Paramodulation.* International Conference on Functional Programming (ICFP), Copenhagen, September 11.

2012 *Local Actions for a Curry-style Operational Semantics.* Programming Languages Meets Program Verification (PLPV), Austin, Texas, January 29.

Other External Talks

2018 *High-Assurance Machine Learning.* Air Force Research Lab, Wright-Patterson Air Force Base, Dayton, Ohio, April 6.

2016 *Verified Learning Without Regret: A Mechanized Proof of the Multiplicative Weights Update Algorithm.* University of Toledo EECS, Toledo, Ohio, October 24.
2016 *Software Verification and Security @ OHIO.* AFRL/NASIC/NASA/Ohio Universities Networking Day, Dayton, Ohio, July 15.
2016 *Operational Semantics of a Compositional Compiler.* Bowling Green State University, Bowling Green, Ohio, April 25.
2014 *Compositional Compilation for C.* School of Electrical Engineering and Computer Science, Ohio University, November 24.
2012 *Towards Extensible, Compilable, Concurrent Clight Separation Logic.* FLINT Group, Department of Computer Science, Yale University, November 20.

Selected Internal Talks

2016 *How to Verify a Compiler.* Ohio University EECS Graduate Seminar (Oct. 13) and Ohio University Student ACM Chapter (Sept. 7).
2016 *How to Prove a Program.* Ohio University Math Club, Athens, Ohio, September 19.
2015 *Verifiable Computing with Lambda (and Friends).* Programming Languages Group, Department of Computer Science, Princeton University, April 3.
2014 *Ziria: A DSL and Optimizing Compiler for Wireless PHY and Bitsream Programming.* Programming Languages Group, Department of Computer Science, Princeton University, November 10.

TEACHING

Regular Courses

2019 Programming Languages, Ohio University, Fall (Instructor)
2019 Software Verification, Ohio University, Fall (Instructor)
2019 Formal Languages and Compilers, Ohio University, Spring (Instructor)
2018 Programming Languages, Ohio University, Fall (Instructor)
2018 Software Verification, Ohio University, Fall (Instructor)
2018 Advanced Topics in Programming Languages, Ohio University, Spring (Instructor)
2018 Formal Languages and Compilers, Ohio University, Spring (Instructor)
2017 Programming Languages, Ohio University, Fall (Instructor)
2017 Software Verification, Ohio University, Fall (Instructor)
2016 Formal Languages and Compilers, Ohio University, Spring (Instructor)
2015 Special Topics: Software Verification, Ohio University, Fall (Instructor)
2014 Programming Languages, Princeton, Spring (Teaching Assistant)
2012 Advanced Programming Techniques, Princeton, Spring (Teaching Assistant)
2011 Introduction to Computer Science, Princeton, Spring (Teaching Assistant)
2010 Introduction to Computer Science, Princeton, Fall (Teaching Assistant)

Graduate Independent Studies

2019 Verified Systems, Ohio University, Fall (Instructor)

Undergraduate Tutorials

Individual courses with undergraduates through Ohio University's Honors Tutorial College

2019 William Kanieski, Fall (Software Foundations)
2019 Garett Cunningham, Spring (Software Foundations)
2018 Benjamin Carman, Fall (Software Foundations)
2018 William Kanieski, Spring (Algorithmic Game Theory)
2018 Seaghan Sefton, Spring (Hardware Security)
2017 Seaghan Sefton, Fall (Hardware Security)
2017 Reilly Zink, Fall (Software Foundations)
2016 Collin Tidwell, Fall (Social Choice Theory)
2016 Matthias Everhart, Fall (Machine Learning)
2016 Matthias Everhart, Spring (Software Foundations)

ADVISING

PhD Alexander Bagnall
MS Herman Hill (graduated 2019)
MS Robin Kelby
MS David Masters
PhD Samuel Merten
MS Nathan St. Amour
MS Timothy Steinberger

ACADEMIC SERVICE

2019 CoqPL Program Committee (Member)
2019 Journal of Aerospace Information Systems (External Reviewer)
2018 IEEE Transactions on Information Forensics & Security (External Reviewer)
2018 Journal of Formalized Reasoning (External Reviewer)
2018 NSF, Software/Hardware Foundations (Panelist)
2017 NSF, Software/Hardware Foundations (Panelist)
2016 NSF, Software/Hardware Foundations (Panelist)
2016 PLDI External Review Committee (Member)
2015 IEEE Transactions on Wireless Communications (External Reviewer)
2013 SAIRP 2013 (External Reviewer)
2013 ITP 2013 (External Reviewer)
2012 ITP 2012 (External Reviewer)

AWARDS AND HONORS

2013 Wu Prize for Excellence, Princeton School of Engineering and Applied Science
2010 Honorable Mention, NSF Graduate Research Fellowship Program
2009 University Fellowship, Princeton University

PROFESSIONAL MEMBERSHIPS

2010–present Association for Computing Machinery

STATUS

United States Citizen (b. Wilmington, DE)

REFERENCES

Available upon request