

Stephanie Weirich

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Education

Cornell University <i>Ph.D., Computer Science</i>	Ithaca, NY <i>August 2002</i>
Cornell University <i>M.S., Computer Science</i>	Ithaca, NY <i>August 2000</i>
Rice University <i>B.A., Computer Science</i> <i>magnum cum laude</i>	Houston, TX <i>May 1996</i>

Positions Held

University of Pennsylvania <i>Associate Professor</i>	Philadelphia, Pennsylvania <i>July 2008-present</i>
University of Cambridge <i>Visitor</i>	Cambridge, UK <i>August 2009-July 2010</i>
Microsoft Research <i>Visiting Researcher</i>	Cambridge, UK <i>September-November 2009</i>
University of Pennsylvania <i>Assistant Professor</i>	Philadelphia, Pennsylvania <i>July 2002-July 2008</i>
Cornell University <i>Instructor, Research Assistant and Teaching Assistant</i>	Ithaca, New York <i>August 1996-July 2002</i>
Lucent Technologies <i>Intern</i>	Murray Hill, New Jersey <i>June-July 1999</i>

Research Interests

Programming languages, Type systems, Functional programming, Generic programming, Dependent types, Program verification, Proof assistants

Honors

- Penn Engineering Fellow, University of Pennsylvania, 2014.
- Institute for Defense Analyses Computer Science Study Panel, 2007.
- National Science Foundation CAREER Award, 2003.
- Intel Graduate Student Fellowship, 2000–2001.
- National Science Foundation Graduate Research Fellowship, 1996–1999.
- CRA-W Distributed Mentorship Project Award, 1996.
- Microsoft Technical Scholar, 1995–1996.

Technical Society Membership

- Association for Computing Machinery, 1998-present
- ACM SIGPLAN, 1998-present
- ACM SIGLOG, 2014-present
- IFIP Working Group 2.8 (Functional Programming), 2003-present
- IFIP Working Group 2.11 (Program Generation), 2007-2012

Teaching Experience

- CIS 120 - Programming Languages and Techniques I
- CIS 552 - Advanced Programming
- CIS 670/700 - Advanced topics in Programming Languages
- CIS 500 - Software Foundations
- CIS 341 - Programming Languages

Students

Dissertation supervision.....

- Richard Eisenberg, anticipated graduation date: 2015.
- Brent Yorgey, anticipated graduation date: Fall 2014.
- Vilhelm Sjöberg, anticipated graduation date: Fall 2014.
- Chris Casinghino, anticipated graduation date: August 2014.
- Dimitrios Vytiniotis, August 2008.
Practical type inference for first-class polymorphism
Current position: Microsoft Research, Cambridge UK.
- Geoffrey Washburn, December 2007.
Principia Narcissus: How to avoid being caught by your reflection
Current position: Logicblox.

Dissertation committee member.....

- Peter Michael Osera, Penn, proposal April 2014.
- Daniel Wagner, Penn, June 2014 (expected).
- Harley Eades III, University of Iowa, May 2014.
- Julien Cretin, INRIA / University Paris 7, January 2014.
- Michael Greenberg, Penn (chair), December 2013.
- Hongbo Zhang, Penn, Master's thesis, December 2013.
- Karl Mazurak, Penn (chair), May 2013.
- Jianzhao Zhao, Penn, April 2013.
- Aaron Bohannon, Penn, February 2012.
- Jean-Philippe Bernardy, Chalmers ("Faculty Opponent"), Gothenburg, Sweden, June 2011.
- Jeffrey Vaughan, Penn, December 2009.
- Boris Yakobowski, INRIA / University Paris 7, December 2008.
- Dan Dantas, Princeton University, August 2007.
- Stephen Tse, Penn, August 2007.
- Wahnghong Nam, Penn, December 2006.
- Joeseeph Vanderwaart, Carnegie Mellon University, August 2006.
- Vladimir Gapayev, Penn, January 2006.

Visiting PhD student supervision.....

- Antoine Voizard, INRIA. Mar-Aug 2014.
- Steven Keuchel, University of Ghent, Sep 2013-Mar 2014.
- Arthur Charguéraud (co-supervised with Benjamin Pierce), INRIA, 2007.

Independent study.....

- Graduate: Antal Spector-Zablosky, Spring 2013. Jennifer Paykin, Fall 2012. Richard Eisenberg, Justin Hsu, Spring 2012. Richard Eisenberg, Hongbo Zhang. Fall 2011. Brent Yorgey, Peter-Michael Osera, Vilhelm Sjöberg. Fall 2008-Spring 2009. Chris Casighino, Spring 2008. Andrew Hilton (co-advised), Karl Mazurak, Jeff Vaughan, Fall 2004. Liang Huang, Spring 2004.
- Undergraduate: Kaycee Anderson, Juan Jose Lopez, Caroline Ho, and Johanna Martens, Senior Design Project, 2013-2014. Mitchell Stern, Spring 2014. Hamidhasan Ahmed, Spring 2014, Summer 2013. Sneha Popey, Summer 2008. Stephanie Simon, Summer 2008. David Gorski, Fall 2006. Parshant Mittal, Atish Davda, Fall 2005. Neal Parikh, Summer 2004.

Research Community Service

Journal Service.....

- Editor of Journal of Functional Programming, 2011-present
- Guest Editor (with Zhenjiang Hu, Shin-Cheng Mu), Progress in Informatics. Special Issue on Advanced Programming Techniques for Construction of Robust, General and Evolutionary Programs, March 2013.
- Guest Editor (with Benjamin Pierce), Journal of Automated Reasoning. Special Issue on the POPLmark Challenge. October 2012.
- Editorial Board, Foundations and Trends in Programming Languages, 2012-present.
- Nomination committee, SIGPLAN CACM Research Highlights, 2009-2011.

Conference and Workshop Organization.....

- Dependently-Typed Programming Workshop (DTP) 2013, program chair and organizer.
- Shonan Village Dependently-Typed Programming, 2011, co-organizer.
- Types in Language Design and Implementation Workshop, 2011, general chair.
- International Conference on Functional Programming (ICFP) 2010, program chair.
- Haskell Symposium 2009, program chair.
- Workshop on Mechanizing Metatheory, 2006-2009, co-organizer.
- Workshop on Mechanizing Metatheory, 2006, program chair.

Program Committee Membership (conference/symposium).....

- Certified Proofs and Programs (CPP) 2015.
- Principles of Programming Languages (POPL) 2014.
- Functional and Logic Programming (FLOPS) 2014.
- Typed Lambda Calculi and Applications (TLCA) 2013.
- Asian Symposium on Programming Languages and Systems (APLAS) 2012.
- International Symp. on Principles and Practice of Declarative Programming (PPDP) 2012.
- Certified Proofs and Programs (CPP) 2011.
- European Symposium on Programming (ESOP) 2011.
- Verified Software, Tools, Theory and Experiments (VSTTE) 2010.
- International Conference on Functional Programming (ICFP) 2007.

- International Conference on Aspect-Oriented Software Development (AOSD) 2007.
- Principles of Programming Languages (POPL) 2006.
- European Symposium on Programming (ESOP) 2006.
- Programming Language Design and Implementation (PLDI) 2004.
- International Conference on Functional Programming (ICFP) 2002.

Program Committee Membership (workshop).....

- Logical Frameworks and Meta Languages Theory and Practice (LFMTP) 2013.
- Trends in Functional Programming in Education (TFPIE) 2013.
- Grace Hopper Conference, Panels, Workshops, and Presentations 2012.
- Programming Languages meets Program Verification Workshop (PLPV) 2010.
- IFIP TC2 Working Conference Domain Specific Languages 2009.
- Proof Carrying Code Workshop 2008.
- Haskell Workshop 2007.
- Workshop on Types in Language Design and Implementation (TLDI) 2007.
- ML Workshop 2006.
- MetaOCaml Workshop, 2005.
- Foundations of Object-Oriented Languages Workshop (FOOL) 2005.
- MetaOCaml Workshop, 2004.
- Foundations of Global Ubiquitous Computing Workshop (FGUC) 2004.
- IFIP TC2 Working Conference on Generic Programming 2002.
- Haskell Workshop 2001.

Steering Committee Membership.....

- Haskell Symposium, 2008-2012
- ICFP, 2009-2012
- TLDI, 2010-present
- PLPV, 2012-present
- WGP, 2012-present
- PLMW, 2012-present

Other.....

- NSF panel: June 2014, October 2012, December 2011, March 2008, December 2004.
- Member: Haskell' language standard committee, 2005-2010.
- TYPES forum moderator: 2003-2009.
- PLDI External Review Committee: 2013, 2011, 2009
- POPL External Review Committee: 2015, 2012.
- Ad hoc reviews: JFP, HOSC, Acta Informatica, TOPLAS, SCP, ICFP, POPL, PLDI, ECOOP, LCTES, ICALP, FOOL, ML, Haskell, PEPM

Department, School and University Service

- University committee on the Facilities, 2011-present. Chair 2013-2014, 2012-2013.
- Graduate student admissions chair, 2013-2014, 2012-2013.
- Faculty advisor to CommuniTech (Penn undergraduate service organization). 2012-present.
- Faculty advisor to AΩE International Engineering and Technical Science Sorority. 2012-present.
- Diversity hiring committee chair, 2012-2013.

- CIS seminar series coordinator, 2011-2012.
- Faculty Council, 2010-2012.
- Academic Performance Committee, 2004-present.
- Penn CIS Undergraduate Women's club (WiCS), 2002-present.
- Penn CIS Graduate Women's club (CISters), 2002-present.
- CIS seminar organizer, 2011-2012.
- CIS 120 reform, 2009-2010.
- Back-up Care Committee, 2009.
- Senior Design Project Judge, 2006.
- Freshman Advisor, 2003.
- Graduate Admissions Committee, 2003-2004.
- Curriculum Committee, 2002-2003.

Outreach

- SRC@ICFP 2014 student research competition, selection committee.
- Workshop co-founder: (with Kathleen Fisher and Ron Garcia) Programming Language Mentoring Workshop (PLMW 2012) Philadelphia, PA, January 24, 2012.
- Programming Contest co-organizer:
 - 2004, Seventh Annual ICFP programming contest
 - 2000, Third Annual ICFP Programming Contest
- Panelist/Speaker:
 - WICS high school day for girls, April 2014, April 2013, April 2012
 - Functional programming in education. Haskell Symposium, September 2013
 - Graduate Student Professional Seminars March 2013, March 2012
 - SWE Graduate Section Inspiration Lunch Talk, April 20, 2012
 - Philadelphia Area Aspirations in Computing Award presentation, March 21, 2012
 - Penn AWE Pre-Orientation, Aug 31, 2011
 - CRA-W/CDC Programming Languages Summer School, UT Austin, May 2007.
 - Women in Science and Engineering Conference, Princeton, February 2006.

Funding

1. *CIF: Small: Rich-Type Inference for Functional Programming*
Weirich (PI). NSF 1319880, \$450,000, 9/2013-8/2016.
2. *SPARCS: Synthesis of Platform-aware Attack-Resilient Control Systems*
Lee (PI), Sokolsky, Pappas, Michael, Mangharam, Weirich, Alur, Tabuada. DARPA, \$5.5 million total, 8/2012-8/2016.
3. *CCF-SHF Small: Beyond Algebraic Data Types: Combinatorial Species and Mathematically-Structured Programming*
Weirich (PI). NSF 1218002, \$325,840, 8/2012-8/2015.
4. *Student Travel Support for Programming languages Mentoring Workshop (PLMW 2012)*
Weirich (PI). NSF \$15,900, 11/2011.
5. *SHF: Small: Dependently-Typed Haskell*
Weirich (PI). NSF 1116620, \$496,785, 8/2011-8/2014.

6. *SHF: Small: Dependently-Typed Haskell REU* Weirich (PI). NSF 1116620, \$6,000, 8/2011-8/2014.
7. *SHF: Large: Collaborative Research: TRELlys:Community-Based Design and Implementation of a Dependently Typed Programming Language* Weirich (Penn), Stump (University of Iowa), Sheard (Portland State University). NSF 0910786, \$2.1 million total. 2009-2014.
8. *Networks Opposing Botnets* Smith (PI), Pierce, Zdancewic, Loo, Weirich, Felton, Rexford, Walker, Morrisett, Welsh. ONR, \$400,000 (Penn), 2009-2012.
9. *Computer Science Study Panel, Phase II* Weirich (PI), Zdancewic. DARPA, \$500,000, 2008-2010.
10. *Collaborative Research: CT-T: Manifest Security* University of Pennsylvania. Pierce (PI), Weirich, Zdancewic. Carnegie Mellon University. Pfenning (PI), Harper, Crary. NSF \$1 million total, 2007-2011.
11. *A Practical Dependently-Typed Functional Programming Language* Weirich (PI). NSF, \$200,000. 2007-2009.
12. *Computer Science Study Panel, Phase I* Weirich. DARPA, \$99,411. 2007-2008.
13. *CRI: Machine Assistance for Programming Languages Research* Weirich (PI), Pierce, Zdancewic. NSF \$200,000, 2006-2008.
14. *CAREER: Type-Directed Programming in Object-Oriented Languages* Weirich (PI), NSF CCF-0347289: \$400,000, 2003-2008.

Invited Talks and Technical Presentations

1. *Depending on Types.* Keynote address, International Conference on Functional Programming (ICFP). September 2014 (Forthcoming)
2. *TBA* WG 2.8, Estes Park, CO, August 2014 (Forthcoming)
3. *Combining Proofs and Programs.* Certification of High-level and Low-level programs. Paris, France, July 2014 (Forthcoming)
4. *Programming Up-to Congruence.* WG 2.8, Aussios, France, October 14, 2013
5. *The pleasure and pain of advanced type systems.* Invited speaker, Facebook Faculty Summit. Menlo Park, CA, August 6, 2013
6. *Paradoxical Typecase.* WG 2.8, Annapolis, MD, November 7, 2012
7. *A POPLmark retrospective: Using proof assistants in programming language research.* Invited speaker, LFMTTP 2012: 7th International Workshop on Logical Frameworks and Meta-languages: Theory and Practice, Copenhagen, Denmark, September 9, 2012

8. *Dependently-typed programming in GHC.*
Invited speaker, FLOPS 2012: Eleventh International Symposium on Functional and Logic Programming, Kobe, Japan, May 25, 2012
9. *Binders Unbound.* The 16th ACM SIGPLAN International Conference on Functional Programming, ICFP 2012 Tokyo Japan, September 21, 2011
10. *Combining Proofs and Programs.* Dependently Typed Programming, Shonan Seminar 007, Shonan Village, Japan, September 16, 2011
11. *Combining Proofs and Programs.*
Joint invited speaker for Rewriting Techniques and Applications (RTA 2011) and Typed Lambda Calculi and Applications (TLCA 2011) Novi Sad, Serbia, June 1, 2011
12. *Combining Proofs and Programs in Trellys.*
Plenary Address, MFPS 27. Pittsburgh, PA. May 26, 2011
13. *Generic Binding and Telescopes.*
WG 2.8, Marble Falls, TX. March 11, 2011
14. *ICFP 2010 Program Chair's report.* Baltimore, MD. September 27, 2010
15. *Dependent types and program equivalence.*
University of Strathclyde. Glasgow, Scotland. April 30, 2010
16. *Generic Programming with Dependent Types.*
IFIP 2.11, St. Andrews, Scotland. March 1-3, 2010
17. *Dependent types and program equivalence.*
University of Nottingham. Nottingham, England. February 5, 2010
18. *Trellys Status Report.*
PLPV Discussion. Madrid, Spain. January 19, 2010
19. *A POPLmark retrospective: Using proof assistants in programming language research.*
University of Cambridge Computer Laboratory Wednesday Seminars. Cambridge, England. December 2, 2009
20. *Dependent types and program equivalence.* Semantics Lunch, University of Cambridge Computer Laboratory. Cambridge, England. November 2, 2009
21. *Haskell Symposium 2009 Program Chair's report.* Edinburgh, Scotland. September 3, 2009
22. *Doing dependent types wrong without going wrong.* IFIP WG 2.8, Frauenchiemsee, Germany, June 2009
23. *Adventures in Dependently-Typed Metatheory.*
IFIP WG 2.11, Mountain View CA. April 15, 2009
24. *Engineering Formal Metatheory*
Computer Science Colloquium, City University of New York Graduate Center. New York, NY. February 2, 2009

25. *First-class Polymorphism for Haskell.*
IFIP WG 2.8, Park City, UT. June 19, 2008
26. *Engineering Formal Metatheory.*
Princeton University, Princeton NJ, USA. November 19, 2007
27. *Machine Assistance for Programming Language Research.*
Cornell University, Ithaca, NY, USA. October 12, 2007
28. *Formal Reasoning About Programs and Programming Languages.*
National Security Agency. Fort Meade, MD, USA.
July 20, 2007
29. *Engineering Aspects of Formal Metatheory.*
Harvard University, Boston MA, USA. June 1, 2007
30. *Dependently-Typed Languages.*
Working session summary. IFIP WG 2.11, Portland, OR, October 2006
31. *Simple Unification-Based Type Inference for GADTs.*
International Conference on Functional Programming (ICFP). Portland, OR. September 2006
32. *RepLib: A Library for Derivable Type Classes.*
Haskell Workshop. Portland, OR. September 2006
33. *Parametricity and GADTs.*
IFIP Working Group 2.8 (Functional Programming). Boston, MA. July 2006
34. *Practical Type Inference for Advanced Type Systems.*
International Federation for Information Processing (IFIP) Working Group 2.11, Dagstuhl, Wadern, Germany. January 2006
35. *Boxy Types: Inference for Higher-rank Types and Impredicativity.*
International Federation for Information Processing (IFIP) Working Group 2.8, Kalvi Manor, Estonia. October 2005
36. *A Core Language for Generalised Algebraic Datatypes.*
International Federation for Information Processing (IFIP) Working Group 2.8, West Point, USA. November 2004
37. *A Design for Type-directed Java.*
Programming Languages Seminar, Yale University, New Haven, CT. October 1, 2004
38. *2004 ICFP Programming Contest Results.*
(Presented jointly with Benjamin Pierce and Steve Zdancewic) International Conference on Functional Programming, Snowbird, UT. September 20, 2004
39. *A Core Language for Generalised Algebraic Datatypes.*
Dagstuhl Seminar 04381: Dependently Typed Programming, Wadern, Germany. September 12, 2004

40. *A Design for Type-Directed Java.*
Microsoft Research Lab, Cambridge, UK. August 31, 2004
41. *A Design for Type-Directed Java.*
Workshop on Object-Oriented Developments (WOOD '04). London, UK, August 2004
42. *Unifying Nominal and Structural Ad-hoc Polymorphism.*
International Federation for Information Processing (IFIP) Working Group 2.8, Coffs Harbour, Australia. January 2003
43. *Unifying Nominal and Structural Ad-hoc Polymorphism.*
Computer Science Colloquium, City University of New York Graduate Center. New York, NY. October 30, 2003
44. *Boxes Go Bananas: Parametric Higher-Order Abstract Syntax in System F.*
Laboratory for Secure Systems Seminar, Stevens Institute of Technology. Hoboken, NJ. May 5, 2003
45. *Run-time type analysis in Haskell with an Awful Lot of Newtypes.*
International Federation for Information Processing (IFIP) Working Group 2.8, Crans-Montana, Switzerland. January 2003
46. *Polytypic Programming and Intensional Type Analysis.*
New Jersey Programming Languages Seminar. University of Pennsylvania, Philadelphia, PA. September 20, 2002
47. *Programming with Types.*
OHSU/Oregon Graduate Institute, Beaverton, OR. February 11, 2002
48. *Programming with Types.*
University of Oregon, Eugene, OR. February 15, 2002
49. *Programming with Types.*
University of Pennsylvania, Philadelphia, PA. February 19, 2002
50. *Programming with Types.*
University of Virginia, Charlottesville, VA. February 28, 2002
51. *Programming with Types.*
University of Maryland, College Park, MD. March 4, 2002
52. *Programming with Types.*
Northeastern University, Boston, MA. March 13, 2002
53. *Programming with Types.*
University of California, San Diego, CA. March 15, 2002
54. *Programming with Types.*
Purdue University, West Lafayette, IN. March 25, 2002
55. *Programming with Types.*
University of Michigan, Ann Arbor, MI. March 27, 2002

56. *Programming with Types*.
University of Texas, Austin, TX. April 2, 2002
57. *Higher-order Intensional Type Analysis*.
European Symposium on Programming (ESOP '02). Grenoble, France, April 2002
58. *Programming with Types*.
University of Colorado at Boulder, CO. April 16, 2002
59. *Programming with Types*.
Pennsylvania State University, State College, PA. April 19, 2002
60. *Programming with Types*.
Massachusetts Institute of Technology, Boston, MA. April 25, 2002
61. *Programming with Types*.
Rice University, Houston TX. April 29, 2002
62. *Run-Time Type Analysis and Program Verification*.
Research, Careers and Computer Science: A Maryland Symposium. University of Maryland,
College Park, MD. November 2001
63. *Polytypic Programming and Intensional Type Constructor Analysis*.
International Federation for Information Processing (IFIP) Working Group 2.8, Are, Sweden.
April 2001
64. *Encoding Intensional Type Analysis*.
European Symposium on Programming (ESOP '01). Genova, Italy. April 2001
65. *Resource Bound Certification*. Harvard University, Boston, MA. February 2001
66. *Functional Pearl: Type-Safe Cast*. International Conference on Functional Programming.
Montreal, Canada. September 2000
67. *Resource Bound Certification*. IBM Research, Hawthorne, NY. June 2000
68. *Resource Bound Certification*. ACM Symposium on Principles of Programming Languages
(POPL '00). Boston, MA, USA. January 2000
69. *Flexible Type Analysis*.
International Conference on Functional Programming (ICFP '99). Paris, France, September
1999
70. *Type Analysis and Typed Compilation*.
Princeton University, Princeton, NJ. June 1999
71. *Intensional Polymorphism in Type-Erasure Semantics*.
International conference on Functional Programming (ICFP '98). Baltimore, MD, USA,
September 1998

Tutorials

- *Designing Dependently-Typed Programming Languages.*
Oregon Programming Languages Summer School: Types, Logic, and Verification. Eugene OR, USA. June 2014
- *Why You Should Care About Dependent Types.*
Programming Languages Mentoring Workshop. San Diego, CA, January 21, 2014
- *Designing Dependently-Typed Programming Languages.*
Oregon Programming Languages Summer School: Types, Logic, and Verification. Eugene OR, USA. July 2013
- *Computational Flags*
Swarthmore CATALYST Conference for 7th/8th graders, March 2012
- *Generic Programming with Dependent Types.*
Spring School on Generic and Indexed Programming. Oxford, England. March 2010
- *Coq for Programming Language Metatheory.*
Oregon Programming Languages Summer School on Logic and Theorem Proving in Programming Languages. University of Oregon, July 2008
- *Using Proof Assistants for Programming Language Research or, How to write your next POPL paper in Coq.*
POPL Tutorial, Jan 2008
- *Getting started in PL design research.*
CRA-W/CDC Programming Languages Summer School. UT Austin, May 2007
- *Career paths: How to get started in academia or industry.*
CRA-W/CDC Programming Languages Summer School. UT Austin, May 2007

Publications

Refereed Conference and Workshop Publications.....

Joachim Breitner, Richard A. Eisenberg, Simon Peyton Jones, and Stephanie Weirich. Safe zero-cost coercions for Haskell. In *The 19th ACM SIGPLAN International Conference on Functional Programming*, ICFP '14, September 2014. To appear.

Richard A. Eisenberg, Dimitrios Vytiniotis, Simon Peyton Jones, and Stephanie Weirich. Closed type families with overlapping equations. In *POPL 2014: 41st ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages*, pages 671–683, San Diego, CA, USA, 2014.

Chris Casinghino, Vilhelm Sjöberg, and Stephanie Weirich. Combining proofs and programs in a dependently typed language. In *POPL 2014: 41st ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages*, pages 33–45, San Diego, CA, USA, 2014.

Stephanie Weirich, Justin Hsu, and Richard A. Eisenberg. System FC with explicit kind equality. In *Proceedings of The 18th ACM SIGPLAN International Conference on Functional Programming*, ICFP '13, pages 275–286, Boston, MA, 2013.

Miroslav Pajic, Nicola Bezzo, James Weimer, Rajeev Alur, Rahul Mangharam, Nathan Michael, George J. Pappas, Oleg Sokolsky, Paulo Tabuada, Stephanie Weirich, and Insup Lee. Towards synthesis of platform-aware attack-resilient control systems: extended abstract. In *HiCoNS '13*:

Proceedings of the 2nd ACM international conference on High confidence networked systems, pages 75–76, New York, NY, USA, 2013.

Richard A. Eisenberg and Stephanie Weirich. Dependently typed programming with singletons. In *Haskell Symposium*, pages 117–130, Copenhagen, Denmark, September 2012.

Chris Casinghino, Vilhelm Sjöberg, and Stephanie Weirich. Step-indexed normalization for a language with general recursion. In *Fourth workshop on Mathematically Structured Functional Programming (MSFP '12)*, pages 25–39, 2012.

Vilhelm Sjöberg, Chris Casinghino, Ki Yung Ahn, Nathan Collins, Harley D. Eades III, Peng Fu, Garrin Kimmell, Tim Sheard, Aaron Stump, and Stephanie Weirich. Irrelevance, heterogeneous equality, and call-by-value dependent type systems. In *Fourth workshop on Mathematically Structured Functional Programming (MSFP '12)*, pages 112–162, 2012.

Garrin Kimmell, Aaron Stump, Harley D. Eades III, Peng Fu, Tim Sheard, Stephanie Weirich, Chris Casinghino, Vilhelm Sjöberg, Nathan Collins, and Ki Yung Ahn. Equational reasoning about programs with general recursion and call-by-value semantics. In *Sixth ACM SIGPLAN Workshop Programming Languages meets Program Verification (PLPV '12)*, pages 15–26, 2012.

Brent A. Yorgey, Stephanie Weirich, Julien Cretin, Simon Peyton Jones, Dimitrios Vytiniotis, and José Pedro Magalhães. Giving Haskell a promotion. In *Seventh ACM SIGPLAN Workshop on. Types in Language Design and Implementation (TLDI '12)*, pages 53–66, 2012.

Stephanie Weirich, Brent A. Yorgey, and Tim Sheard. Binders unbound. In *Proceeding of the 16th ACM SIGPLAN International Conference on Functional Programming*, ICFP '11, pages 333–345, New York, NY, USA, 2011.

Tim Sheard, Aaron Stump, and Stephanie Weirich. Language-based verification will change the world. In *2010 FSE/SDP Workshop on the Future of Software Engineering Research*, November 2010. Position paper.

Stephanie Weirich, Dimitrios Vytiniotis, Simon Peyton Jones, and Steve Zdancewic. Generative type abstraction and type-level computation. In *POPL 11: 38th ACM SIGACT-SIGPLAN Symposium on Principles of Programming Languages, January 26–28, 2011. Austin, TX, USA.*, pages 227–240, January 2011.

Aaron Stump, Vilhelm Sjöberg, and Stephanie Weirich. Termination casts: A flexible approach to termination with general recursion. In *Workshop on Partiality and Recursion in Interactive Theorem Provers*, Edinburgh, Scotland, July 2010.

Michael Greenberg, Benjamin Pierce, and Stephanie Weirich. Contracts made manifest. In *37th ACM SIGACT-SIGPLAN Symposium on Principles of Programming Languages (POPL)*, pages 353–364, Madrid, Spain, January 2010.

Limin Jia, Jianzhou Zhao, Vilhem Sjöberg, and Stephanie Weirich. Dependent types and program equivalence. In *37th ACM SIGACT-SIGPLAN Symposium on Principles of Programming Languages (POPL)*, pages 275–286, Madrid, Spain, January 2010.

Aaron Bohannon, Benjamin C. Pierce, Vilhelm Sjöberg, Stephanie Weirich, and Steve Zdancewic. Reactive noninterference. In *16th ACM Conference on Computer and Communications Security*, pages 79–90, November 2009.

Stephanie Weirich and Chris Casinghino. Arity-generic type-generic programming. In *ACM SIGPLAN Workshop on Programming Languages Meets Program Verification (PLPV)*, pages 15–26, January 2010.

Dimitrios Vytiniotis, Stephanie Weirich, and Simon Peyton Jones. Fph: First-class polymorphism for haskell. In *ICFP 2008: The 13th ACM SIGPLAN International Conference on Functional Programming*, pages 295–306, Victoria, BC, Canada, September 2008.

Brian Aydemir, Arthur Charguéraud, Benjamin C. Pierce, Randy Pollack, and Stephanie Weirich. Engineering formal metatheory. In *ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages (POPL)*, pages 3–15, January 2008.

Dimitrios Vytiniotis and Stephanie Weirich. Dependent types: Easy as PIE. In Marco T. Morazán and Henrik Nilsson, editors, *Draft Proceedings of the 8th Symposium on Trends in Functional Programming*, pages XVII–1–XVII–15. Dept. of Math and Computer Science, Seton Hall University, April 2007. TR-SHU-CS-2007-04-1.

Dimitrios Vytiniotis and Stephanie Weirich. Free theorems and runtime type representations. In *Mathematical Foundations of Programming Semantics (MFPS XXIII)*, pages 357–373, New Orleans, LA, USA, April 2007.

Brian Aydemir, Aaron Bohannon, and Stephanie Weirich. Nominal reasoning techniques in Coq. In *International Workshop on Logical Frameworks and Meta-Languages: Theory and Practice (LFMTP)*, pages 60–69, Seattle, WA, USA, August 2006.

Stephanie Weirich. RepLib: A library for derivable type classes. In *Haskell Workshop*, pages 1–12, Portland, OR, USA, September 2006.

Geoffrey Washburn and Stephanie Weirich. Good advice for type-directed programming: Aspect-oriented programming and extensible generic functions. In *Workshop on Generic Programming (WGP)*, pages 33–44, Portland, OR, USA, September 2006.

Benjamin C. Pierce, Peter Sewell, Stephanie Weirich, and Steve Zdancewic. It is time to mechanize programming language metatheory. In *Verified Software: Theories, Tools, Experiments (VS:TTE)*, Zürich, Switzerland, October 2005. 5 pages.

Dimitrios Vytiniotis, Stephanie Weirich, and Simon L. Peyton Jones. Boxy type inference for higher-rank types and impredicativity. In *International Conference on Functional Programming (ICFP)*, pages 251–262, Portland, OR, USA, September 2006.

Simon L. Peyton Jones, Dimitrios Vytiniotis, Stephanie Weirich, and Geoffrey Washburn. Simple unification-based type inference for GADTs. In *International Conference on Functional Programming (ICFP)*, pages 50–61, Portland, OR, USA, September 2006.

Daniel S. Dantas, David Walker, Geoffrey Washburn, and Stephanie Weirich. PolyAML: A polymorphic aspect-oriented functional programming language. In *ACM SIGPLAN International Conference on Functional Programming (ICFP)*, pages 306–319, Tallinn, Estonia, September 2005.

Brian E. Aydemir, Aaron Bohannon, Matthew Fairbairn, J. Nathan Foster, Benjamin C. Pierce, Peter Sewell, Dimitrios Vytiniotis, Geoffrey Washburn, Stephanie Weirich, and Steve

Zdancewic. Mechanized metatheory for the masses: The POPLmark challenge. In *The 18th International Conference on Theorem Proving in Higher Order Logics (TPHOLs)*, pages 50–65, Oxford, UK, August 2005.

Geoffrey Washburn and Stephanie Weirich. Generalizing parametricity using information flow. In *Twentieth Annual IEEE Symposium on. Logic in Computer Science (LICS 2005)*, pages 62–71, Chicago, IL, USA, June 2005.

Stephanie Weirich and Liang Huang. A design for type-directed Java. In Viviana Bono, editor, *Workshop on Object-Oriented Developments (WOOD)*, ENTCS, pages 117–136, 2004.

Dimtrios Vytiniotis, Geoffrey Washburn, and Stephanie Weirich. An open and shut typecase. In *ACM SIGPLAN Workshop on Types in Language Design and Implementation*, pages 13–24, Long Beach, CA, USA, January 2005.

Geoffrey Washburn and Stephanie Weirich. Boxes go bananas: Encoding higher-order abstract syntax with parametric polymorphism. In *ACM SIGPLAN International Conference on Functional Programming (ICFP)*, pages 249–262, Uppsala, Sweden, August 2003.

Stephanie Weirich. Higher-order intensional type analysis. In Daniel Le Métayer, editor, *11th European Symposium on Programming (ESOP)*, pages 98–114, Grenoble, France, April 2002.

Stephanie Weirich. Encoding intensional type analysis. In D. Sands, editor, *10th European Symposium on Programming (ESOP)*, pages 92–106, Genova, Italy, April 2001.

Stephanie Weirich. Type-safe cast: Functional pearl. In *Proceedings of the fifth ACM SIGPLAN International Conference on Functional Programming (ICFP)*, pages 58–67, Montreal, Canada, September 2000.

Karl Crary and Stephanie Weirich. Resource bound certification. In *The Twenty-Seventh ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages (POPL)*, pages 184–198, Boston, MA, USA, January 2000.

Greg Morrisett, Karl Crary, Neal Glew, Dan Grossman, Richard Samuels, Frederick Smith, David Walker, Stephanie Weirich, and Steve Zdancewic. TALx86: A realistic typed assembly language. In *Second ACM SIGPLAN Workshop on Compiler Support for System Software*, pages 25–35, Atlanta, GA, USA, May 1999. Published as INRIA research report number 0228, March 1999.

Karl Crary and Stephanie Weirich. Flexible type analysis. In *Proceedings of the fourth ACM SIGPLAN International Conference on Functional Programming (ICFP)*, pages 233–248, Paris, France, September 1999.

Karl Crary, Stephanie Weirich, and Greg Morrisett. Intensional polymorphism in type erasure semantics. In *Proceedings of the third ACM SIGPLAN International Conference on Functional Programming (ICFP)*, pages 301–313, Baltimore, MD, USA, September 1998.

Cormac Flanagan, Matthew Flatt, Shriram Krishnamurthi, Stephanie Weirich, and Matthias Felleisen. Catching bugs in the web of program invariants. In *ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI)*, pages 23–32, 1996.

Articles in Journals.....

Zhengjiang Hu, Shin-Cheng Mu, and Stephanie Weirich. Advanced programming techniques for construction of robust, generic and evolutionary programs. *Progress in Informatics*, (10):1–2, March 2013.

Garrin Kimmel, Aaron Stump, Harley D. Eades, Peng Fu, Tim Sheard, Stephanie Weirich, Chris Casinghino, Vilhelm Sjöberg, Nathin Collins, and Ki Yunh Anh. Equational reasoning about programs with general recursion and call-by-value semantics. *Progress in Informatics*, (10):19–48, March 2013.

Benjamin C. Pierce and Stephanie Weirich. Preface. *J. Autom. Reasoning*, 49(3):301–302, 2012.

Kathleen Fisher, Ronald Garcia, and Stephanie Weirich. Nourishing the future of the field: the programming language mentoring workshop 2012. *SIGPLAN Not.*, 47(4a):14–15, April 2012.

Umut A. Acar, James Cheney, and Stephanie Weirich. Editorial - special issue dedicated to icfp 2010. *J. Funct. Program.*, 22(4-5):379–381, 2012.

Michael Greenberg, Benjamin C. Pierce, and Stephanie Weirich. Contracts made manifest. *Journal of Functional Programming*, 22(3):225–274, May 2012.

Dimitrios Vytiniotis and Stephanie Weirich. Parametricity, type equality and higher-order polymorphism. *Journal of Functional Programming*, 20(2):175–210, March 2010.

Daniel S. Dantas, David Walker, Geoffrey Washburn, and Stephanie Weirich. AspectML: A polymorphic aspect-oriented functional programming language. *ACM Transactions on Programming Languages*, 30(3):1–60, May 2008.

Simon L. Peyton Jones, Dimitrios Vytiniotis, Stephanie Weirich, and Mark Shields. Practical type inference for arbitrary-rank types. *Journal of Functional Programming*, 17(1):1–82, January 2007.

Geoffrey Washburn and Stephanie Weirich. Boxes go bananas: Encoding higher-order abstract syntax with parametric polymorphism. *Journal of Functional Programming*, 18(1):87–140, January 2008.

Stephanie Weirich. Type-safe cast. *Journal of Functional Programming*, 14(6):681–695, November 2004.

Stephanie Weirich. Type-safe run-time polytypic programming. *Journal of Functional Programming*, 16(10):681–710, November 2006.

Karl Crary, Stephanie Weirich, and Greg Morrisett. Intensional polymorphism in type erasure semantics. *Journal of Functional Programming*, 12(6):567–600, November 2002.

Chapters in Books.....

Stephanie Weirich. Type systems. In Teofilo Gonzalez, editor, *Computing Handbook Set—Computer Science (I)*, pages 69–1–69–39. CRC Press, third edition, 2014. Forthcoming.

Stephanie Weirich and Chris Casinghino. Generic programming with dependent types. In Jeremy Gibbons, editor, *Generic and Indexed Programming*, number 7470 in Lecture Notes in Computer Science, pages 217–258. Springer-Verlag Berlin Heidelberg, 2012.

Michael Hicks, Stephanie Weirich, and Karl Crary. Safe and flexible dynamic linking of native code. In R. Harper, editor, *Types in Compilation: Third International Workshop, TIC 2000; Montreal, Canada, September 21, 2000; Revised Selected Papers*, volume 2071 of *Lecture Notes in Computer Science*, pages 147–176. Springer, 2001.

[Thesis](#).....

Stephanie Weirich. *Programming With Types*. PhD thesis, Cornell University, August 2002.

[Technical Reports](#).....

Joachim Breitner, Richard A. Eisenberg, Simon Peyton Jones, and Stephanie Weirich. Safe zero-cost coercions for Haskell (extended version). Technical Report MS-CIS-14-07, Univ. of Pennsylvania, 2014.

Richard A. Eisenberg, Dimitrios Vytiniotis, Simon Peyton Jones, and Stephanie Weirich. Closed type families with overlapping equations (extended version). Technical Report MS-CIS-13-10, University of Pennsylvania, 2013.

Chris Casinghino, Vilhelm Sjöberg, and Stephanie Weirich. Combining proofs and programs in a dependently typed language (with technical appendix). Technical Report MS-CIS-13-08, University of Pennsylvania, 2013.

Stephanie Weirich, Dimitrios Vytiniotis, Simon Peyton Jones, and Steve Zdancewic. Generative type abstraction and type-level computation (extended version). Technical report, November 2010.

Aaron Stump, Vilhelm Sjöberg, and Stephanie Weirich. Termination casts: A flexible approach to termination with general recursion (technical appendix). Technical Report MS-CIS-10-21, University of Pennsylvania Department of Computer and Information Science, 2010.

Brian Aydemir and Stephanie Weirich. Lngen: Tool support for locally nameless representations. Technical Report MS-CIS-10-24, Computer and Information Science, University of Pennsylvania, June 2010.

Brian Aydemir, Steve Zdancewic, and Stephanie Weirich. Abstracting syntax. Technical Report MS-CIS-09-06, Computer and Information Science, University of Pennsylvania, March 2009.

Karl Crary, Robert Harper, Frank Pfenning, Benjamin C. Pierce, Stephanie Weirich, and Stephan Zdancewic. Manifest security. Technical report, January 2007. White paper.

Dimitrios Vytiniotis, Stephanie Weirich, and Simon L. Peyton Jones. Boxy type inference for higher-rank types and impredicativity, Technical Appendix. Technical Report MS-CIS-05-23, University of Pennsylvania, April 2006.

Dimitrios Vytiniotis, Stephanie Weirich, and Simon L. Peyton Jones. Simple unification-based type inference for GADTs, Technical Appendix. Technical Report MS-CIS-05-22, University of Pennsylvania, April 2006.

Daniel S. Dantas, David Walker, Geoffrey Washburn, and Stephanie Weirich. Polyaml: A polymorphic aspect-oriented functional programming language (extended version). Technical Report MS-CIS-05-07, University of Pennsylvania, Department of Computer and Information Science, 2005.

Simon L. Peyton Jones, Dimitrios Vytiniotis, Stephanie Weirich, and Mark Shields. Practical type inference for arbitrary-rank types (technical appendix). Technical Report MIS-CIS-05-14, University of Pennsylvania, July 2005.

Geoffrey Washburn and Stephanie Weirich. Generalizing parametricity using information flow (extended version). Technical Report MS-CIS-05-04, Computer and Information Science, University of Pennsylvania, July 2005.

Simon L. Peyton Jones, Geoffrey Washburn, and Stephanie Weirich. Wobbly types: Practical type inference for generalised algebraic datatypes. Technical Report MS-CIS-05-26, University of Pennsylvania, Computer and Information Science Department, Levine Hall, 3330 Walnut Street, Philadelphia, Pennsylvania, 19104-6389, July 2004.

Dan S. Dantas, David Walker, Geoffrey Washburn, and Stephanie Weirich. Analyzing polymorphic advice. Technical Report TR-717-04, Princeton University Computer Science, December 2004.

Liang Huang and Stephanie Weirich. A design for type-directed programming in Java (extended version). Technical Report MS-CIS-04-11, University of Pennsylvania, Computer and Information Science, October 2004.

Dimtrios Vytiniotis, Geoffrey Washburn, and Stephanie Weirich. An open and shut typecase (extended version). Technical Report MS-CIS-04-26, University of Pennsylvania, Computer and Information Science, October 2004.

Geoffrey Washburn and Stephanie Weirich. Boxes go bananas: Encoding higher-order abstract syntax with parametric polymorphism (extended version). Technical Report MS-CIS-03-26, University of Pennsylvania, Computer and Information Science, September 2003.

Karl Crary, Stephanie Weirich, and Greg Morrisett. Intensional polymorphism in type erasure semantics (extended version). Technical Report TR98-1721, Cornell University, Computer Science, November 1998.

Michael Hicks and Stephanie Weirich. A calculus for dynamic loading. Technical Report MS-CIS-00-07, University of Pennsylvania, April 2000.