Sam Tobin-Hochstadt

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Research Interests

My research focuses on the design and analysis of software and programming languages. I am particularly interested in how programs grow from prototype scripts to robust software, and how programming language design can support this process. My research concerns type systems, software contracts, modularity, and extensibility.

Appointments

2013—	Assistant Professor, SOIC, Indiana University
2011—2013	Research Assistant Professor, CCIS, Northeastern University
2009—2011	Mozilla Postdoctoral Research Fellow, CCIS, Northeastern University
2003—2009	Research & Teaching Assistant, CCIS, Northeastern University
2004—2006	Intern, Programming Languages Research Group, Sun Microsystems Labs

Education

2010	PH.D in Computer Science, Northeastern University
	Thesis title: *Typed Scheme: From Scripts to Programs*
	Received CCIS Outstanding Research Award
2006	MA in Computer Science, Northeastern University
2003	BS in Computer Science with Honors, University of Chicago

Grants

2012—2015	Behavioral Software Contract Verification, Principal Investigator (Co-PI David Van Horn). Grant awarded by NSF Division of Computer and Communication Foundations. $399,992
2011—2012	Gift from the Mozilla Foundation, $74,900
2009—2011	2-year Mozilla Research Fellowship, Mozilla Foundation, $200,000

Publications: Journals & Selective Conferences

2013	The Design and Implementation of Typed Scheme, with Matthias Felleisen, *Higher Order and Symbolic Computation (HOSC)*, to appear.
2013	Constraining Delimited Control with Contracts, with Asumu Takikawa and T. Stephen Strickland, *Proc. of the 22nd European Symposium on Programming (ESOP)*.
2012	Gradual Typing for First-Class Classes, with Asumu Takikawa, T. Stephen Strickland, Christos Dimoulas, and Matthias Felleisen, *Proc. of the 2012 ACM Conference on Object Oriented Programming Systems, Languages, and Applications (OOPSLA)*. **Best Student Paper**

2012   Higher-Order Symbolic Execution via Contracts, with David Van Horn, *Proc. of the 2012 ACM Conference on Object Oriented Programming Systems, Languages, and Applications (OOPSLA).*

2012   Optimization Coaching, with Vincent St-Amour and Matthias Felleisen, *Proc. of the 2012 ACM Conference on Object Oriented Programming Systems, Languages, and Applications (OOPSLA).*

2012   Chaperones and Impersonators: Runtime Support for Reasonable Interposition, with T. Stephen Strickland, Robert Bruce Findler, and Matthew Flatt, *Proc. of the 2012 ACM Conference on Object Oriented Programming Systems, Languages, and Applications (OOPSLA).*

2012   Complete Monitoring for Behavioral Contracts, with Christos Dimoulas and Matthias Felleisen, *Proc. 21st European Symposium on Programming (ESOP).*

2012   Run Your Research: On the Effectiveness of Lightweight Mechanization, with Casey Klein, John Clements, Christos Dimoulas, Carl Eastlund, Matthias Felleisen, Matthew Flatt, Jay A. McCarthy, Jon Rafkind, and Robert Bruce Findler, *Proc. 39th ACM Symposium on Principles of Programming Languages (POPL).*

2012   Typing the Numeric Tower, with Vincent St-Amour, Matthew Flatt, and Matthias Felleisen, *2012 Symposium on Practical Aspects of Declarative Languages (PADL).*

2011   Languages as Libraries, with Vincent St-Amour, Ryan Culpepper, Matthew Flatt, and Matthias Felleisen, *Proc. 32nd ACM Conference on Programming Language Design and Implementation (PLDI).*

2010   Logical Types for Untyped Languages, with Matthias Felleisen, *Proc. 15th ACM International Conference on Functional Programming (ICFP).*

2009   Practical Variable-Arity Polymorphism, with Matthias Felleisen and T. Stephen Strickland, *Proc. Eighteenth European Symposium on Programming (ESOP).*

2008   The Design and Implementation of Typed Scheme, with Matthias Felleisen, *Proc. 35th ACM Symposium on Principles of Programming Languages (POPL).*

2006   Interlanguage Migration: From Scripts to Programs, with Matthias Felleisen, *Dynamic Languages Symposium at OOPSLA (DLS).*

Publications: Workshops & Technical Reports

2011   Semantic Solutions to Program Analysis Problems (Abstract), with David Van Horn, *2011 Fun Ideas and Thoughts Session at the 32nd ACM Conference on Programming Language Design and Implementation (FIT).*

2010   Extensible Pattern Matching for Extensible Languages (Abstract), *2010 Symposium on Implementation and Application of Functional Languages (IFL).*

2010   Where are you going with those types? (Abstract), with Vincent St-Amour, Matthias Felleisen, and Matthew Flatt, *2010 Symposium on Implementation and Application of Functional Languages (IFL).*

2010   Purely Functional Data Structures for Typed Racket, with Hari Prashanth K R, *2010 Workshop on Scheme and Functional Programming.*

2009   Cycles without pollution: a gradual typing poem, with Robert Bruce Findler, *First Workshop on Script to Program Evolution (STOP).*

2007   Advanced Macrology and the Implementation of Typed Scheme, with Ryan Culpepper and Matthew Flatt, *2007 Workshop on Scheme and Functional Programming.*

2005   A Core Calculus of Metaclasses, with Eric Allen, *Twelfth Workshop on Foundations of Object-Oriented Languages (FOOL).*

2004—2008	Fortress Language Specification, with Eric Allen, David Chase, Joe Hallet, Victor Luchangco, Jan-Willem Maessen, Sukyoung Ryu, and Guy L. Steele Jr., versions 0.618-1.0, Sun Microsystems Technical Report.

Patents

2006	Method and apparatus for expressing and checking relationships between types, with Sukyoung Ryu, Eric Allen, Victor Luchangco, and Joe Hallet, US Patent 8,225,294.

Teaching

2012	Instructor, Fundamentals of Computer Science 2 (Honors)
2011	Instructor, Fundamentals of Computer Science 2 (Honors)
2009	Instructor, Fundamentals of Computer Science 1
2005	Instructor, Fundamentals of Computer Science 2
2003—2008	Teaching Assistant, Fundamentals of CS 1 (2003, 2004), Fundamentals of CS 2 (2004), Software Development (2005), Programming Languages (2006, 2008)

Students

2011—	Tony Garnock-Jones, Ph.D student, Northeastern University (Co-advisor)
2010—	Vincent St-Amour, Ph.D student, Northeastern University (Co-advisor)
2012—	Phil Nguyen, MS student, Northeastern University
2009—2011	Hari Prashanth K R, MS Thesis, Northeastern University
2007	Ivan Gazeau, Ph.D student from École normale supérieure (Paris)

Selected Talks

2013	From Principles to Practice with Class in the First Year. OOPSLA PC Meeting Workshop
2013	Evolving Software from Scripts to Programs. ETH Zurich Department of Computer Science, Indiana University Department of Computer Science, Iowa State University Software Engineering Seminar, University of Idaho Department of Computer Science
2012	Research meets Application: Life on the EcmaScript Committee. Northeastern University Ph.D Seminar
2012	Occurrence Typing. Dagstuhl meeting on Foundation of Scripting Languages
2012	Languages as Libraries. Dagstuhl meeting on Foundation of Scripting Languages
2011	Domain-Specific Languages for GnoSys. DARPA CRASH PI Meeting
2011	Evolving Software from Scripts to Programs. Oregon State University Department of Computer Science
2010	From Scripts to Programs. Indiana University Department of Computer Science
2010	Logical Types for Scheme. New England Programming Languages and Systems Symposium
2010	Typed Scheme: From Scripts to Programs. Harvard University Programming Languages Seminar
2009	Types for Scheme, in Scheme. Boston Lisp Meeting
2009	Typed Scheme: From Scripts to Programs. Sun Microsystems Laboratories
2009	The Design and Implementation of Typed Scheme. Symposium in Honor of Mitchell Wand
2008	To Type or Not to Type. Northeastern University ACM Lecture Series

Professional Activities

2014	Symposium on Implementation and Application of Functional Languages, Chair
2013—2014	International Conference on Functional Programming, Workshop Co-Chair
2013	Foundations of Software Engineering 2013 New Ideas Track, Program Committee
2013	SPLASH: OOPSLA, Program Committee
2012	Dynamic Languages Symposium, Program Committee
2012	International Conference on Functional Programming, Program Committee
2012	Workshop on Script to Program Evolution, Chair
2010—2013	TC39 - ECMAScript (Standards Committee for JavaScript), Member
2011	Workshop on Scheme and Functional Programming, Program Committee
2011	New England Programming Languages and Systems Symposium, Chair
2011	Workshop on Script to Program Evolution, Program Committee
2011	Workshop on Types in Language Design and Implementation, Program Committee
2010	Workshop on Foundations of Object-Oriented Languages, Program Committee
2010	Symposium on Trends in Functional Programming, Program Committee

Reviewer for J. of Functional Programming, ESOP 2013, POPL 2013, OOPSLA 2012, ECOOP 2012, VMCAI 2012, OOPSLA 2009, ICFP 2008

Professional Associations

Association for Computing Machinery, SIGPLAN

References

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