

Scott Kilpatrick

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Research interests

Programming language design and modularity. My research focuses on the design of type systems for modular programming, with a methodology rooted in type theory and in reform, not revolution.

Education

- 2010–Present **Ph.D. Computer Science**, *Max Planck Institute for Software Systems (MPI-SWS) / Saarland University*, Saarbrücken, Germany.
Advisor: Derek Dreyer. Thesis: “Making Haskell More Modular.”
- 2008–2010 **M.S. Computer Science**, *University of Texas at Austin*, Austin, TX, USA.
Advisors: William Cook & Eric Allen. Thesis: “Ad Hoc: Overloading and Language Design.”
- 2003–2008 **B.S. Computer Science & B.S. Mathematics**, *University of Texas at Austin*, Austin, TX, USA.
Selected as 1 of 18 *2008 Dean’s Honored Graduates* of the College of Natural Sciences (top 1%).

Publications

Scott Kilpatrick, Derek Dreyer, Simon Peyton Jones, Simon Marlow. “Backpack: Retrofitting Haskell with Interfaces.” *Principles of Programming Languages (POPL)* 2014.

Eric Allen, Justin Hilburn, **Scott Kilpatrick**, Victor Luchangco, Sukyoung Ryu, David Chase, Guy L. Steele Jr. “Type Checking Modular Multiple Dispatch with Parametric Polymorphism and Multiple Inheritance.” *Object-Oriented Programming, Systems, Languages & Applications (OOPSLA)* 2010.

Awards and honors

- College of Natural Sciences **2008 Dean’s Honored Graduate**, UT Austin, 2008.
- **Unrestricted Endowed Presidential Scholarship**, UT Austin, 2007.
- College of Natural Sciences **Scholar**, UT Austin, 2006 & 2008.
- College of Natural Sciences **Distinguished Scholar**, UT Austin, 2005.

Projects

Research

- 2011–Present **Primary inventor of Haskell Backpack, my PhD thesis work**, *MPI-SWS*, Saarbrücken, Germany.
Identified practical problems in Haskell’s support for modular programming. Designed new paradigm of modular programming in Haskell that builds on existing system and advances state of the art. Developed and proved formal metatheory of Haskell modularity to evaluate design.
- 2014–Present **Collaborator on implementation of Backpack**, *MPI-SWS*, Saarbrücken, Germany.
Working with Simon Peyton Jones, Edward Yang, and Derek Dreyer on modifying Backpack design for GHC Haskell implementation. Helping with design decisions for new Cabal packaging infrastructure to be formalized in future Haskell specification.
- 2008–2010 **Research Assistant**, *UT Austin & Sun Microsystems Laboratories*, Austin, TX, USA.
Worked under co-principal investigator Eric Allen on frontend implementation of Fortress programming language. Ported typechecker from Java to Scala to drastically simplify code base. Implemented type inference engine to support overloaded generic functions. Extended type system design to solve long-standing technical problem in Fortress standard library.
- 2005–2006 **Honors R&D Intern**, *UT Applied Research Labs, Space and Geophysics Lab*, Austin, TX, USA.
Implemented mathematical model of space weather conditions in Fortran 90 with OpenMP parallelization. Developed extraction and processing of international satellite data in Python.

Industry

- Summer 2008 **Software Engineering Intern**, *Google, Inc.*, Sydney, Australia.
Worked on C++ backend and frontends of Google Maps APIs for Flash and JavaScript. Implemented driving/walking directions in Google Maps API for Flash.
- Summer 2007 **Software Engineering Intern**, *Google, Inc.*, Mountain View, CA, USA.
Developed Java backend for email migration API into Google Hosted Services.

Programming experience

- More recently Haskell, Scala
Less recently Java, OCaml/SML, Unix tools, Python, C, C++, JavaScript, PHP

Teaching

- Spring 2009 **Teaching Assistant, Graduate Distributed Computing**, *University of Texas at Austin*.
Graded theoretical and implementation assignments; wrote sample solutions; held office hours; and managed active student mailing list for graduate distributed systems course. Average student evaluation: 4.6/5.0.
- Fall 2008 **Teaching Assistant, Honors Programming Languages**, *University of Texas at Austin*.
Graded assignments and exams; wrote sample solutions; and held weekly recitation and office hours for undergraduate honors course on type systems. Lectured on the basics of functional programming and introduced Scala for assignments. Average student evaluation: 4.6/5.0.
- Fall 2008 **Teaching Assistant, Elements of Web Programming**, *University of Texas at Austin*.
Graded assignments and exams for basic HTML, PHP, and JavaScript usage for non-major undergraduates.

Service and leadership

- Nov 2014 **Founder and leader of Strategy & Communication group**, *Max Planck PhDnet*, Germany.
– Present Founded workgroup to plan long-term interests of PhDnet, the organization representing ~5,000 PhD students across the German Max Planck Society. Directed regular Skype meetings of up to eight remote members and co-wrote articles on PhD funding and conditions, including one published in *Science Careers*.
- 2014 **Graduate Student Representative**, *MPI-SWS*, Saarbrücken, Germany.
Led and represented the ~40 PhD students within the institute. Attended weekly faculty meetings to represent students; started and led monthly student meetings; helped start student-led scientific seminar; learned and navigated administrative situations on behalf of students; started biannual student report; and co-organized 2014 institute biannual retreat, at which I created and moderated Q&A session on challenges facing the institute.

Miscellaneous

US citizen