

Dimitrios Vytiniotis

Microsoft Research
7 JJ Thomson Ave, Cambridge CB3 0FB, UK
dimitriv@gmail.com
<http://www.cis.upenn.edu/~dimitriv>

Current position

Postdoctoral Researcher in the Programming Principles and Tools group, Microsoft Research, Cambridge, UK. Primary research focus on Programming Languages. Joined September 2008.

Education

- University of Pennsylvania CIS Department PhD graduate, August 2008. Supervised by Dr. Stephanie Weirich. Thesis topic is *Practical type-inference for first-class polymorphism*.
- M.Eng., BSc, National Technical University of Athens (NTUA), Electrical and Computer Engineering Department, February 2002. Graduated in top 3% of 300.

Research areas

Type Inference. Type inference design for advanced type system features; first-class polymorphism, generalized algebraic datatypes, existential types, higher-order, and dependent types.

Dependent Types. Language design and implementation for dependently typed programming. Incorporation of dependent types in languages with general recursion and effects.

Logical Relations and Semantics of Programming Languages. Relational semantics for recursive and polymorphic types. Recent work includes a parametricity result for a variant of the λ_R language of Cray, Weirich, and Morrisett, formalized in the Isabelle/HOL proof assistant, and a compact formalization of parametricity for higher-order polymorphism.

Research positions

- Summer internship, Microsoft Research Cambridge Laboratory, 2005. Worked under the supervision of Simon Peyton Jones on type inference for generalized algebraic datatypes and first-class polymorphism.
- Research student, Software Engineering Laboratory, NTUA, 2002-2003. Worked under the supervision of Nikolaos Papaspyrou on porting Coq libraries to a Haskell implementation of the Calculus of Inductive Constructions, as part of a new version of the Yale FLINT compiler.

Refereed publications

- [VWP08] Dimitrios Vytiniotis, Stephanie Weirich, and Simon Peyton Jones. FPH: First-class polymorphism for Haskell. In *ICFP '08: Proceedings of the Eight ACM SIGPLAN International Conference on Functional Programming*, pages 295–306, New York, NY, USA, 2008. ACM Press.
- [PVWS07] Simon Peyton Jones, Dimitrios Vytiniotis, Stephanie Weirich, and Mark Shields. Practical type inference for arbitrary-rank types. *J. Funct. Program.*, 17(1):1–82, 2007.
- [VW07b] Dimitrios Vytiniotis and Stephanie Weirich. Free theorems and runtime type representations. In M. Fiore and M. Mislove, editors, *Proceedings of the 23rd Annual Conference on Mathematical Foundations of Programming Semantics (MFPS XXIII)*, volume 173 of *Electronic Notes in Theoretical Computer Science*, pages 357–373, 2007.
- [PVWW06] Simon Peyton Jones, Dimitrios Vytiniotis, Stephanie Weirich, and Geoffrey Washburn. Simple unification-based type inference for GADTs. In *ICFP '06: Proceedings of the Eleventh ACM SIGPLAN International Conference on Functional Programming*, pages 50–61, New York, NY, USA, 2006. ACM Press.

- [VWP06b] Dimitrios Vytiniotis, Stephanie Weirich, and Simon Peyton Jones. Boxy types: inference for higher-rank types and impredicativity. In *ICFP '06: Proceedings of the Eleventh ACM SIGPLAN International Conference on Functional Programming*, pages 251–262, New York, NY, USA, 2006. ACM Press.
- [ABF⁺05] B. Aydemir, A. Bohannon, M. Fairbairn, J. Foster, B. Pierce, P. Sewell, D. Vytiniotis, G. Washburn, S. Weirich, and S. Zdancewic. Mechanized metatheory for the masses: The POPLmark challenge. In *Proceedings of the Eighteenth International Conference on Theorem Proving in Higher Order Logics (TPHOLs 2005)*, 2005.
- [VWW05] Dimitrios Vytiniotis, Geoffrey Washburn, and Stephanie Weirich. An open and shut typecase. In *The Second ACM SIGPLAN Workshop on Types in Language Design and Implementation*, pages 13–24, Long Beach, California, January 2005. ACM SIGPLAN.
- [NVK03] Nikolaos Papaspyrou, Dimitrios Vytiniotis, and Vasileios Koutavas. Logic-enhanced type systems: Programming language support for reasoning about security and other program properties. In *Proceedings of the Fourth Panhellenic Logic Symposium*, Thessaloniki, July 2003.

Other publications

- [Vyt08] Dimitrios Vytiniotis. *Practical type inference for first-class polymorphism*. PhD thesis, University of Pennsylvania, Computer and Information Science Department, August 2008.
- [VW07c] Dimitrios Vytiniotis and Stephanie Weirich. Type-safe cast does no harm. 2007.
- [VW07a] 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*. Dept. of Math and Computer Science, Seton Hall University, TR-SHU-CS-2007-04-1, April 2007.
- [VWP06a] Dimitrios Vytiniotis, Stephanie Weirich, and Simon Peyton Jones. Boxy type inference for higher-rank types and impredicativity, Technical Appendix. Technical Report MS-CIS-05-23, University of Pennsylvania, April 2006.
- [VWP06c] Dimitrios Vytiniotis, Stephanie Weirich, and Simon Peyton Jones. Simple unification-based type inference for GADTs, Technical Appendix. Technical Report MS-CIS-05-22, University of Pennsylvania, April 2006.
- [FV06] Nate Foster and Dimitrios Vytiniotis. A Theory of Featherweight Java in Isabelle/HOL. In Gerwin Klein, Tobias Nipkow, and Lawrence Paulson, editors, *The Archive of Formal Proofs*. <http://afp.sourceforge.net/entries/FeatherweightJava.shtml>, March 2006. Formal proof development.
- [VWP05] Dimitrios Vytiniotis, Stephanie Weirich, and Simon Peyton Jones. Practical type inference for arbitrary-rank types, Technical Appendix. Technical Report MS-CIS-05-14, University of Pennsylvania, July 2005.
- [VWW04] Dimitrios Vytiniotis, Stephanie Weirich, and Geoffrey Washburn. An open and shut typecase. Technical Report MS-CIS-04-26, University of Pennsylvania, April 2004.

Service

- External reviewer for ICFP 2005, ESOP 2006, FLOPS 2006, POPL 2007, Haskell 2007, ICFP 2007, POPL 2008, Information & Computation, Journal of Functional Programming, ICFP 2008, POPL 2009.
- Member of the POPLmark team, helped organize the POPL 2008 Coq tutorial “Using Proof Assistants for Programming Language Research”.
- Participated in the organization of the ICFP 2004 programming contest.
- Maintained software and web pages for the Penn programming languages group, plclub.org.

Teaching

- Teaching assistant for CSE 399, Advanced Functional Programming (advanced undergraduate) (Penn, Pierce, 2005)
- Teaching assistant for CIS 500, Software Foundations (graduate) (Penn, Weirich, 2004)
- Teaching assistant for Compilers course (undergraduate) (NTUA, Papaspyrou, 2003)
- Teaching assistant for Introduction to Programming course (undergraduate) (NTUA, Papaspyrou, 2002)

Talks

- FPH: First-class polymorphism for Haskell, ICFP 2008, Victoria, British Columbia, Canada, September 24, 2008.
- Practical type inference for first-class polymorphism, NTUA PL Seminar 2007, Athens, Greece, December 28, 2007.
- Free theorems and runtime type representations, MFPS XXIII, New Orleans, LA, April 14, 2007.
- Dependent Types: Easy as Pie, TFP 2007, New York, NY, April 2, 2007.
- Dependently typed programming with GADTs, NTUA PL Seminar 2006, Athens, Greece, December 2006.
- Boxy Types, ICFP 2006, Portland, OR, September 20, 2006.
- Boxy Types, Microsoft Research Cambridge, UK, August 2005.
- An open and shut typecase, New Jersey Programming Languages and Systems Seminar, Philadelphia, PA, February 25, 2005.
- An open and shut typecase, TLDI 2005, Long Beach, CA, January 10, 2005.

Graduate coursework

- PHIL412, Topics in Logic (Advanced Set Theory) (Weinstein, Spring 2007) (audit)
- CIS700, Mechanizing Programming Language Metatheory (Weirich, Fall 2006) (audit)
- CIS700, Parametric and ad-hoc Polymorphism (Weirich, Fall 2006) (audit)
- CIS700, Proof Theory (Pierce, Zdancewic, Weirich, Spring 2005)
- CIS682, Friendly Logics (Tannen, Fall 2005)
- CIS670, Advanced Prog. Languages Seminar (Pierce, Fall 2004)
- CIS700, π -calculus (Pierce and Zdancewic, Spring 2004)
- CIS502, Analysis of Algorithms (Khanna, Spring 2004)
- CIS511, Theory of Computation (Gallier, Spring 2004)
- CIS500, Software Foundations (Pierce, Fall 2003)
- CIS670, Advanced Type Systems (Weirich, Fall 2003)
- CIS501, Computer Architecture (Roth, Fall 2003)
- Computational Complexity (at NTUA) (Zachos, Fall 2002)

Work experience

- Software Engineer, Semantix SA, Athens, 2002-2003. Design and development of code generator from XML specifications, design and development of data clearing house software for the Vodafone Group, design and development of device controlling software. C/C++, bash, Java.
- Software Engineer, NTUA and Democritos Inst., 2001. Design and development of grammatical and stylistic checker for technical texts in Greek. Java.
- Programmer, Navel Ltd, Athens, 2000. Web applications development. Java, Perl.