

# Joshua Dunfield

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- Research interests** Applied programming languages: type-based verification, typed compilation, functional programming, programming environments, proof assistants.
- Personal** US citizen; eligible for Canadian permanent residence (outside Québec) under the Canadian Experience Class.
- Education** Postdoctoral Fellow, School of Computer Science, McGill University (Montréal, Canada), September 2007–August 2010. Supervisor: Brigitte Pientka.  
Ph.D. Computer Science, Carnegie Mellon University (Pittsburgh, Pennsylvania, USA), August 2007.  
Dissertation title: *A Unified System of Type Refinements*.  
Committee: Frank Pfenning (chair), Jonathan Aldrich, Robert Harper, Benjamin Pierce (Univ. of Pennsylvania).  
B.S. (high honors) Computer Science, Portland State University (Portland, Oregon, USA), August 2000.
- Fellowships** US NSF Graduate Research Fellowship, 2000–2003.
- Refereed papers** Joshua Dunfield.  
Greedy bidirectional polymorphism.  
In *Workshop on ML (ML '09)*, pp. 15–26, August 2009. (6/11  $\approx$  55% accepted.)  
Brigitte Pientka and Joshua Dunfield.  
Programming with proofs and explicit contexts.  
In *Principles and Practice of Declarative Programming (PPDP '08)*, pp. 163–173, July 2008. (24/51  $\approx$  47% accepted.)  
Joshua Dunfield and Brigitte Pientka.  
Case analysis of higher-order data.  
In *Logical Frameworks and Meta-languages: Theory and Practice (LFMTP '08)*, pp. 69–84, June 2008. (11/15  $\approx$  73% accepted.)  
Joshua Dunfield.  
Refined typechecking with Stardust.  
In *Programming Languages meets Program Verification (PLPV '07)*, pp. 21–32, October 2007. (6/8  $\approx$  75% accepted.)  
Joshua Dunfield and Frank Pfenning.  
Tridirectional typechecking.  
In *Principles of Programming Languages (POPL '04)*, pp. 281–292, January 2004. (29/176  $\approx$  16% accepted.)  
Joshua Dunfield and Frank Pfenning.  
Type assignment for intersections and unions in call-by-value languages.  
In *Found. Software Science and Computation Structures (FOSSACS '03)*, pp. 250–266, April 2003. (26/94  $\approx$  28% accepted.)

- Unrefereed papers**
- Joshua Dunfield.  
*A Unified System of Type Refinements*.  
 PhD thesis, Carnegie Mellon University, August 2007.  
 Published as Technical Report CMU-CS-07-129.
- Joshua Dunfield and Frank Pfenning.  
 Tridirectional typechecking.  
 Carnegie Mellon University technical report CMU-CS-04-117,  
 March 2004. (Extended version of POPL '04 paper.)
- Joshua Dunfield.  
 Combining two forms of type refinements.  
 Carnegie Mellon University technical report CMU-CS-02-182,  
 September 2002.
- Service**
- External reviewer: CSL '02, POPL '04, LICS '05, SAC '06, ICFP '08, POPL '08, PLDI '09,  
 PLPV '09, FMTP '09.
- PC member: ITRS '10.
- Supervised research**
- 2007– : Programming with higher-order abstract syntax.  
 Supervised by Brigitte Pientka (McGill University).
- 2001–2007: Type refinements.  
 Supervised by Frank Pfenning (Carnegie Mellon University).
- 2000–2001: Grid computing. Supervised by Robert Harper (Carnegie Mellon University).
- 1998–1999: Compiling ML to Java; term rewriting for optimizations.  
 Supervised by Andrew Tolmach (Portland State University).
- Teaching experience**
- COMP 523 Language-Based Security, McGill University, Winter 2008.  
 Teaching assistant for Brigitte Pientka. Graded assignments and held office hours.  
 (Ended early due to a teaching assistant strike.)
- 15–312 Foundations of Programming Languages, Carnegie Mellon University,  
 Fall 2002. Teaching assistant for Frank Pfenning. Held weekly recitations, guest  
 lectured, prepared and graded assignments, assisted in exam creation and grading,  
 and held office hours. Student evaluations (1 to 4 scale):
- |                         | min. | mean | max. |
|-------------------------|------|------|------|
| “Overall effectiveness” | 3    | 3.73 | 4    |
| union of all questions  | 3    | 3.68 | 4    |
- 15–212 Principles of Programming, Carnegie Mellon University, Spring 2001. Teaching  
 assistant for Michael Erdmann and Jeannette Wing. Held weekly recitation,  
 prepared and graded assignments, assisted with exam creation and grading, and  
 held office hours.