

# John Gregory Morrisett

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**Current Position** HARVARD UNIVERSITY, Cambridge, Massachusetts.  
Allen B. Cutting Professor of Computer Science, 2004 – present.

**Previous Positions** HARVARD UNIVERSITY, Cambridge, Massachusetts.  
Associate Dean for Computer Science & Engineering, 2007 – 2010.

CORNELL UNIVERSITY, Ithaca, New York.  
Associate Professor, Computer Science Department, July 2001 – December 2003.

MICROSOFT RESEARCH, LTD., Cambridge, United Kingdom.  
Visiting Researcher, August 2002 – June 2003.

CORNELL UNIVERSITY, Ithaca, New York.  
Assistant Professor, Computer Science Department, January 1996 – July 2001.

DIGITAL RESEARCH LABORATORY, Cambridge, Massachusetts.  
Research Assistant, May 1992 – August 1992.

AT&T BELL LABORATORIES, Murray Hill, New Jersey.  
Research Assistant, May 1991 – August 1991.

CARNEGIE MELLON UNIVERSITY, Pittsburgh, Pennsylvania.  
Research Assistant, September 1989 – December 1995.

**Education:** CARNEGIE MELLON UNIVERSITY, Pittsburgh, Pennsylvania.  
Ph.D. in Computer Science, 1995.  
Thesis title: *Compiling with Types*.  
Advisors: Robert Harper and Jeannette Wing

CARNEGIE MELLON UNIVERSITY, Pittsburgh, Pennsylvania.  
M.S. in Computer Science, 1991.

UNIVERSITY OF RICHMOND, Richmond, Virginia.  
B.S. in Mathematics & Computer Science, 1989.

**Professional Activities** Director, Harvard Center for Research on Computation and Society  
Chief Editor, *Journal of Functional Programming*  
Co-Editor, *Communications of the ACM Research Highlights*  
Editor, *Information Processing Letters*  
Associate Editor, *Journal of the ACM*  
Associate Editor, *ACM Transactions on Programming Languages and Systems*  
National Science Foundation CISE Advisory Board

Microsoft Technical Advisory Board  
Microsoft Trustworthy Computing Academic Advisory Board  
DARPA ISAT Advisory Board  
Max Planck Institute for Software Systems Scientific Advisory Board  
University of Texas at El Paso Computer Science Advisory Board  
Co-Chair, National Science Foundation CISE/CCF Committee of Visitors  
Member, IFIP Working Group 2.8 on Functional Programming  
National Academy of Engineering Study on Software Producibility  
IARPA Study on Software of Unknown Provenance  
DARPA Study on Machine Learning and Multi-Core  
ACM SIGPLAN Executive Committee, Member at Large  
Program Chair, ACM Principles of Programming Languages  
General Chair, ACM Principles of Programming Languages  
General Chair, ACM International Conference on Functional Programming  
General Chair, ACM International Symposium on Memory Management  
Fortify, Inc. Technical Advisory Board  
Board Member, Murty Classical Library of India

**Journal  
Publications:**

G.Malecha, G.Morrisett, and R.Wisnesky. Trace Based Verification of Imperative Programs with I/O. In D.Ballis and T.Kutsia, Ed., Special Issue on Automated Specification and Verification of Web Systems. *Journal of Symbolic Computation*. 46(2):95-118, 2010.

G. Morrisett. Technical perspective: a compiler's story. *Commun. ACM*, 52(7):106-106, 2009.

A.Nanevski, G.Morrisett, and L.Birkedal. Hoare Type Theory, Polymorphism and Separation. *Journal of Functional Programming*, 18(5&6):865-911, 2008.

A.Ahmed, M.Fluet, and G.Morrisett. L3: A Linear Language with Locations. In P.Urzyczyn editor, Special Issue on Typed Lambda Calculi and Applications 2005, *Fundamenta Informaticae*, 77(4):397-449, June 2007.

M.Fluet and G.Morrisett. Monadic Regions. *Journal of Functional Programming*, 16(4-5):485-545, July 2006.

N.Swamy, M.Hicks, G.Morrisett, D.Grossman, and T.Jim. Safe Manual Memory Management in Cyclone. *Science of Computer Programming*, 62(2):122-144, October 2006.

K.Hamlen, G.Morrisett, and F.B.Schneider. Computability Classes for Enforcement Mechanisms. *ACM Transactions on Programming Languages and Systems*, 28(1): 175-205, 2006.

F.Smith, D.Grossman, G.Morrisett, L.Hornoff, and T.Jim. Compiling for Runtime Code Generation. *Journal of Functional Programming* 13(3):677-708, May 2003.

G.Morrisett, K.Crary, N.Glew, and D.Walker. Stack-Based Typed Assembly Language. *Journal of Functional Programming*, 12(1):43-88, January 2002.

S.Zdancewic, D.Grossman, and G.Morrisett. Syntactic Type Abstraction. *ACM Transactions on Programming Languages and Systems*, 22(6):1037-1080, November 2002.

K.Crary, S.Weirich, and G.Morrisett. Intensional Polymorphism in Type-Erasure Semantics. *Journal of Functional Programming*, 12(6):567-600, November 2002.

G.McGraw and G.Morrisett. Attacking Malicious Code: A Report to the INFOSEC Research Council. *IEEE Software*, 17(5), September/October 2001.

D.Walker, K.Crary, and G.Morrisett. Typed Memory Management via Static Capabilities. *ACM Transactions on Programming Languages and Systems*, 22(4):701-771, July 2000.

G.Morrisett, D.Walker, K.Crary, and N.Glew. From System-F to Typed Assembly Language. *ACM Transactions on Programming Languages and Systems*, 21(3):527-568, May 1999.

N.Haines, D.Kindred, J.G.Morrisett, S.M.Nettles, and J.M.Wing. Composing First-Class Transactions. *ACM Transactions on Programming Languages and Systems*, Short Communication, November 1994.

## Book Chapters

G.Morrisett. Typed Assembly Language. In Benjamin C. Pierce, editor, *Advanced Topics in Types and Programming Languages*, MIT Press, 2005.

## Conference Publications

A. Dehon, B. Karel, B. Montagu, B. Pierce, J. Smith, T. Knight, S. Ray, G. Sullivan, G. Malecha, G. Morrisett, R. Pollack, R. Morriset, and O. Shivers. Preliminary design of the SAFE platform. In *Proceedings of the 6th Workshop on Programming Languages and Operating Systems (PLOS 2011)*. ACM, Oct. 2011.

B. Zeng, G. Tan, and G. Morrisett. Combining control-flow integrity and static analysis for efficient and validated data sandboxing. In *18th ACM Conference on Computer and Communications Security*. ACM, Oct. 2011.

J.-B. Tristan, P. Govereau, and G. Morrisett. Evaluating value-graph translation validation for LLVM. In *Proceedings of the ACM SIGPLAN Conference on Programming Design and Implementation (PLDI)*, New York, NY, USA, 2011. ACM.

J.Siefers, G.Tan, and G.Morrisett. Robusta: Taming the native beast of the JVM. In *17th ACM Conference on Computer and Communications Security (CCS)*, New York, NY, USA, Nov. 2010.

G. Malecha and G. Morrisett. Mechanized verification with sharing. In *7th International Colloquium on Theoretical Aspects of Computing*, Sept. 2010.

G. Mainland and G. Morrisett. Nikola: Embedding compiled GPU functions in Haskell. In *Proceedings of the 2010 ACM SIGPLAN Symposium on Haskell (Haskell'10)*, New York, NY, USA, Sept. 2010.

G. Malecha, G. Morrisett, A. Shinnar, and R. Wisnesky. Toward a verified relational database management system. In *POPL '10: Proceedings of the 37th annual ACM SIGPLAN-SIGACT symposium on Principles of Programming Languages*, pages 237-248, New York, NY, USA, 2010.

A. Chlipala, G. Malecha, G. Morrisett, A. Shinnar, and R. Wisnesky. Effective interactive proofs for higher-order imperative programs. In *ICFP '09: Proceedings of the 14th ACM SIGPLAN International Conference on Functional Programming*, September 2009.

R. Wisnesky, G. Malecha, and G. Morrisett. Certified web services in Ynot. In *5th International Workshop on Automated Specification and Verification of Web Systems*, July 2009.

A. Nanevski, P. Govereau, and G. Morrisett. Towards type-theoretic semantics for transactional concurrency. In *ACM SIGPLAN Workshop on Types in Language Design and Implementation*, January 2009.

A.Nanevski, G.Morrisett, A.Shinnar, P.Govereau, and L.Birkedal. Ynot: Reasoning with the Awkward Squad. In *Proceedings of the 13<sup>th</sup> ACM SIGPLAN International Conference on Functional Programming*, Victoria, British Columbia, September 2008.

G.Mainland, G.Morrisett, and M.Welsh. Flask: Staged Functional Programming for Sensor Networks. In *Proceedings of the 13<sup>th</sup> ACM SIGPLAN International Conference on Functional*

*Programming*, Victoria, British Columbia, September 2008.

R.L.Petersen, L.Birkedal, A.Nanevski, and G.Morrisett. A Realizability Model for Impredicative Hoare Type Theory. In *European Symposium on Programming*, Budapest, Hungary, April 2008.

R.Newton, G.Morrisett, and M.Welsh. The Regiment Macroprogramming System. In *Proceedings of the 6th International Conference on Information Processing in Sensor Networks*, Cambridge, MA, April 2007.

A.Nanevski, G.Morrisett, and L.Birkedal. Polymorphism and Separation in Hoare Type Theory. In *2006 International Conference on Functional Programming*, Portland, Oregon, October 2006.

S.McCamant and G.Morrisett. Evaluating SFI for a CISC Architecture. In *2006 Usenix Security Symposium*, Vancouver, British Columbia, July 2006.

K.Hamlen, G.Morrisett, and F.B.Schneider. Certified In-Lined Reference Monitoring on .NET. In *ACM Workshop on Programming Languages and Analysis for Security*, Ottawa, Canada, June 2006.

M.Fluet, G.Morrisett, and A.Ahmed. Linear Regions are All You Need. *European Symposium on Programming*, Vienna, Austria, March 2006.

A.Ahmed, M.Fluet, and G.Morrisett. A Step-Indexed Model of Substructural State. *2005 International Conference on Functional Programming*, Tallinn, Estonia, September 2005.

G.Morrisett, M.Fluet, and A.Ahmed. L3: A Linear Language with Locations. In *Seventh International Conference on Typed Lambda Calculi and Applications*, Nara, Japan, April 2005.

M.Hicks, G.Morrisett, D.Grossman, and T.Jim. Experience with Safe Manual Memory-Management in Cyclone. In *2004 International Symposium on Memory Management*, Vancouver, British Columbia, October, 2004.

M.Fluet and G.Morrisett. Monadic Regions. In *2004 International Conference on Functional Programming*, Park City, Utah, September 2004.

T.Jim, G.Morrisett, D.Grossman, M.Hicks, J.Cheney, and Y.Wang. Cyclone: A Safe Dialect of C. In *Usenix Annual Technical Conference*, Monterey, California, June 2002.

D.Grossman, G.Morrisett, T.Jim, M.Hicks, Y.Wang, and J.Cheney. Region-Based Memory Management in Cyclone. In *ACM Conference on Programming Language Design and Implementation*, Berlin, Germany, June 2002.

F.B.Schneider, G.Morrisett, and R.Harper. A Language-Based Approach to Security. Informatics: 10 Years Back, 10 Years Ahead, *Lecture Notes in Computer Science*, Vol. 2000, Springer-Verlag, Heidelberg, 86-101.

D.Walker and G.Morrisett. Alias Types for Recursive Data Structures. In *2000 ACM SIGPLAN Workshop on Types in Compilation*, Montreal, Canada, September 2000.

D.Grossman and G.Morrisett. Scalable Certification for Typed Assembly Language. In *2000 ACM SIGPLAN Workshop on Types in Compilation*, Montreal, Canada, September 2000.

F.Smith, D.Walker, and G.Morrisett. Alias Types. In the *European Symposium on Programming*, Berlin, Germany, March 2000.

G.Morrisett, D.Walker, K.Crary, and N.Glew. From System F to Typed Assembly Language.

In *Twenty-Fifth ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages*, pages 85-97, San Diego, USA, January 1998.

S.Zdancewic, D.Grossman, and G.Morrisett. Principals in Programming Languages: A Syntactic Proof Technique. In the *1999 International Conference on Functional Programming*, pages 197-207, Paris, France, September 1999.

G.Morrisett, K.Crary, N.Glew, D.Grossman, R.Samuels, F.Smith, D.Walker, S.Weirich, and S.Zdancewic. TALx86: A Realistic Typed Assembly Language. In *1999 ACM SIGPLAN Workshop on Compiler Support for System Software*, pages 25-35, Atlanta, GA, USA, May 1999.

G.Morrisett and K.Crary. Type Structure for Low-Level Programming Languages. *1999 International Colloquium on Automata, Languages, and Programming*.

N.Glew and G.Morrisett. Type-Safe Linking and Modular Assembly Language. In *Twenty-Sixth ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages*, pages 250-261, San Antonio, TX, USA, January 1999.

K.Crary, D.Walker, and G.Morrisett. Typed Memory Management in a Calculus of Capabilities. In *Twenty-Sixth Symposium on Principles of Programming Languages*, pages 262-275, San Antonio, TX, USA, January 1999.

G.Morrisett, K.Crary, N.Glew, and D.Walker. Stack-Based Typed Assembly Language. In *1998 Workshop on Types in Compilation*, Kyoto, Japan, March 1998. Published in Xavier Leroy and Atsushi Ohori, editors, *Lecture Notes in Computer Science*, volume 1473, pages 28-52. Springer-Verlag, 1998.

F.Smith and G.Morrisett. Comparing Mostly-Copying and Mark-Sweep Conservative Collection. In *1998 International Symposium on Memory Management*, pages 68-78, Vancouver, Canada, October 1998.

K.Crary, S.Weirich, and G.Morrisett. Intensional Polymorphism in Type-Erasure Semantics. *1998 International Conference on Functional Programming*, pages 301-312, Baltimore, September 1998.

G.Morrisett and R.Harper. Typed Closure Conversion for Recursively-Defined Functions (Extended Abstract). *Proceedings of Higher-Order Operational Techniques in Semantics (HOOTS) II*.

A.Basu, M.Hayden, G.Morrisett, and T.von Eiken. A Language-Based Approach to Protocol Construction, *Proceedings of the ACM SIGPLAN Workshop on Domain Specific Languages (WDSL)*, Paris, France, January 1997.

D.Tarditi, G.Morrisett, P.Cheng, C.Stone, R.Harper, and P.Lee. TIL: A Type-Directed Optimizing Compiler for ML. *1996 SIGPLAN Conference on Programming Language Design and Implementation*, pages 181-192, Philadelphia, May 1996.

G.Morrisett, D.Tarditi, P.Cheng, C.Stone, R.Harper, and P.Lee. The TIL/ML Compiler: Performance and Safety Through Types. *Workshop on Compiler Support for Systems Software*. Tucson, February 1996.

Y.Minamide, G.Morrisett, and R.Harper. Typed Closure Conversion. *ACM Symposium on Principles of Programming Languages*. St. Petersburg, pages 271-283, January, 1996.

G.Morrisett, M.Felleisen, and R.Harper. Abstract Models of Memory Management. *Conference on*

*Functional Programming Languages and Computer Architecture*. San Diego, pages 66-77, June 1995.

R.Harper and G.Morrisett. Compiling Polymorphism Using Intensional Type Analysis, *ACM Symposium on Principles of Programming Languages*, San Francisco, pages 130-141, January 1995.

J.G.Morrisett. Refining First-Class Stores. *Proceedings of the ACM SIGPLAN Workshop on State in Programming Languages*, Copenhagen, Denmark, June 1993.

A.Tolmach and G.Morrisett. Procs and Locks: A Portable Multiprocessing Platform for Standard ML of New Jersey, *Proceedings of the Fourth ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming*, San Diego, May 1993.

## **Awards**

Allen B. Cutting Chair, Harvard University (2004)  
Presidential Early Career Award for Scientists and Engineers (October 2000)  
Allen Newell Medal of Research Excellence (2001)  
National Science Foundation Career Award (1999)  
Alfred P. Sloan Fellow (1998)  
IBM Faculty Fellowship (2010)  
Ralph Watts Excellence in Teaching Award (Cornell University)  
Best Paper: Usenix Security Symposium (2006)  
Best Paper 10 years: ACM Symposium on Principles of Programming Languages (1998)  
Best Paper for 10 years: ACM Conference on Programming Language Design and Implementation (1996)  
Best Paper: ACM International Conference on Functional Programming (1999)

## **Post Doctoral Advisees**

Amal Ahmed (Ph.D. Princeton), now at Northeastern University  
Adam Chlipala (Ph.D. Berkeley), now at MIT  
Michael Hicks (Ph.D. University of Pennsylvania), now at University of Maryland  
Aleksander Nanevski (Ph.D. Carnegie Mellon), now at Microsoft Research, Ltd.  
Matthieu Sozeau (Ph.D. Paris XI University – Orsay), now at INRIA  
Jean-Baptiste Tristan (Ph.D. INRIA), now at Oracle Labs  
Jessee Tov (Ph.D. Northeastern University)  
Jeffrey Vaughn (Ph.D. University of Pennsylvania), now at UCLA

## **Ph.D. Advisees**

James Cheney, now at University of Edinburgh  
David Darias  
Ulfar Erlingsson, now at Google  
Matthew Fluet, now at Rochester Institute of Technology  
Neal Glew, now at Intel Research  
Paul Govereau  
Daniel Grossman, now at University of Washington  
Kevin Hamlen, now at University of Texas at Dallas  
Geoffrey Mainland (joint with Matt Welsh), now at Microsoft Research  
Gregory Malecha  
Adam Petcher  
Frederick Smith, now at Mathworks  
Avi Shinnar, now at IBM Research  
David Walker, now at Princeton University  
Stephanie Weirich, now at University of Pennsylvania  
Ryan Wisnesky