David Van Horn

Dept. of Computer Science & UMIACS
University of Maryland
A.V. Williams Building
College Park, MD 20742

www.cs.umd.edu/~dvanhorn
dvanhorn@cs.umd.edu
(202) 460-4104

Education

Ph.D., Brandeis University, Comp. Sci., *The Complexity of Flow Analysis in Higher-Order Languages*, 2009
M.S., University of Vermont, Comp. Sci., *Algorithmic Trace Effect Analysis*, 2006
B.S., University of Vermont, Comp. Sci. & Info. Sys., 2003

Employment

University of Maryland	Associate Professor, 2019–
	Assistant Professor, 2013–2019
Northeastern University	Research Assistant Professor, 2012–2013
	Visiting Assistant Professor, 2011–2012
	CRA Computing Innovation Fellow, 2009–2011

Research interests

I work on all aspects of program analysis and its applications to programming languages, software engineering, verification, and security.

Grants

2016–2019 **Online Verification-Validation**. PI. Awarded by National Science Foundation, CISE, Software and Hardware Foundations. Program Director: Anindya Banerjee. NSF grant 1618756. Budget: $140,000.

2015–2018 **Sound Over- & Under-Approximations of Complexity & Information Security**, Co-PI. Awarded by the DARPA Information Innovation Office (I20), Space/Time Analysis for Cybersecurity (STAC). Program Manager: Timothy Fraser. Budget: $3,408,353.

2015–2017 **The Science and Applications of Crypto-Currency**, Co-PI. Awarded by the National Science Foundation Secure & Trustworthy Cyberspace program. Budget: $1,935,000.

2014–2017 **Trustworthy and Composable Software Systems with Contracts**. PI. Awarded by the National Security Agency, Science of Security. Budget: $358,179.

2012–2015 **Behavioral Software Contract Verification**. Co-PI. Awarded by National Science Foundation, CISE, Software and Hardware Foundations. Program Director: John Reppy. NSF grant 1218390. Budget: $400,000.

2012–2015 **Scalable and Precise Abstractions of Programs for Trustworthy Software**. PI. Awarded by DARPA Information Innovation Office (I20), Automated Program Analysis for Cybersecurity (APAC). Program Manager: Timothy Fraser. Budget: $577,000.

Grants (continued)

2009–2011 **Computing Innovation Fellow**. Awarded by the Computing Research Association and Computing Community Consortium. Funded: $267,500. Subaward of NSF grant CNS-0937060.

Publications: Journals and conferences

2018 **Constructive Galois Connections.** With David Darais. *Journal of Functional Programming*. Special Issue for "Best of ICFP 2016." To appear.

Soft Contract Verification for Higher-order Stateful Programs. With Phuc C. Nguyen, Thomas Gilray, and Sam Tobin-Hochstadt. *The 45th ACM SIGPLAN Symposium on Principles of Programming Languages (POPL'18)*, Los Angeles, USA, January 2018.

2017 **Abstracting Definitional Interpreters.** With David Darais, Phuc C. Nguyen, and Nicholas Labich. *The ACM SIGPLAN International Conference on Functional Programming (ICFP'17)*, Oxford, UK, September 2017. Invited to submit to "best of" special issue of JFP.

Higher-order symbolic execution for contract verification and refutation. With Phuc C. Nguyen and Sam Tobin-Hochstadt. *Journal of Functional Programming*, **27**, January 2017. Special Issue for "Best of ICFP 2014."

2016 **Pushdown Control-Flow Analysis for Free**. With Thomas Gilray, Steven Lyde, Michael D. Adams, and Matthew Might. *The 43rd ACM SIGPLAN-SIGACT Symposium on Principles in Programming Languages (POPL'16)*, St. Petersburg, Florida, January 2016.

Constructive Galois Connections. With David Darais. *The ACM SIGPLAN International Conference on Functional Programming (ICFP'16)*, Nara, Japan, September 2016.

A Vision for Online Verification-Validation. With Matthew A. Hammer and Bor-Yuh Evan Chang. *The 15th International Conference on Generative Programming: Concepts & Experience (GPCE'16)*, Amsterdam, Netherlands, November 2016.

2015 **Galois Transformers and Modular Abstract Interpreters**. With David Darais and Matthew Might. *Proceedings of the ACM SIGPLAN Conference on Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA'15)*, Pittsburgh, Pennsylvania, October 2015.

Incremental Computation with Names. With Matthew A. Hammer, Joshua Dunfield, Kyle Headley, Nicholas Labich, Jeffrey S. Foster, and Michael Hicks. *Proceedings of the ACM SIGPLAN Conference on Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA'15)*, Pittsburgh, Pennsylvania, October 2015.

Relatively Complete Counterexamples for Higher-Order Programs. With Phuc C. Nguyen. *Proceedings of the 36th ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI'15)*, Portland, Oregon, June 2015.

Running Probabilistic Programs Backwards. With Neil Toronto and Jay McCarthy. *Proceedings of the European Symposium on Programming (ESOP'15)*, London, United Kingdom, April, 2015.

2014 **Abstracting Abstract Control**. With J. Ian Johnson. *Proceedings of the 10th ACM Symposium on Dynamic Languages (DLS'14)*, Portland, Oregon, October 2014.

Publications: Journals and conferences (continued)

Soft Contract Verification. With Phuc C. Nguyen and Sam Tobin-Hochstadt. *Proceedings of the ACM SIGPLAN International Conference on Functional Programming (ICFP'14)*, Gothenburg, Sweden, September 2014.

Pruning, Pushdown Exception-Flow Analysis. With Shuying Liang, Weibin Sun, Matthew Might, and Andrew W. Keep. *Proceedings of the 14th IEEE International Conference on Software Code Analysis and Manipulation*, Victoria, British Columbia, September 2014.

Pushdown flow analysis with abstract garbage collection. With J. Ian Johnson, Ilya Sergey, Christopher Earl, and Matthew Might. *Journal of Functional Programming*, **24**(2-3), May 2014. Special Issue for "Best of ICFP 2012."

2013 **Optimizing Abstract Abstract Machines**. With J. Ian Johnson, Nicholas Labich, and Matthew Might. *Proceedings of the 18th ACM SIGPLAN International Conference on Functional Programming (ICFP'13)*, Boston, Massachusetts, September, 2013.

2012 **Higher-Order Symbolic Execution via Contracts**, with Sam Tobin-Hochstadt. *The ACM SIGPLAN Conference on Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA'12)*, Tuscon, Arizona, October, 2012.

Introspective Pushdown Analysis of Higher-order Programs. With Christopher Earl, Ilya Sergey, and Matthew Might. *Proceedings of the 17th ACM SIGPLAN International Conference on Functional Programming (ICFP'12)*, Copenhagen, Denmark, September, 2012.

Systematic Abstraction of Abstract Machines, with Matthew Might. *Journal of Functional Programming*, **22**(4–5), Special Issue for "Best of ICFP 2010."

Subcubic Control Flow Analysis Algorithms. With Jan Midtgaard. To appear in *Higher-Order and Symbolic Computation*.

2011 **Abstracting Abstract Machines: A Systematic Approach to Higher-Order Program Analysis**. With Matthew Might. In *Communications of the ACM, Research Highlights* **54**(9), September, 2011.

A Family of Abstract Interpretations for Static Analysis of Concurrent Higher-Order Programs, In *The 18th International Static Analysis Symposium (SAS 2011)*, Venice, Italy, September, 2011. Lecture Notes in Computer Science, 6887.

2010 **Abstracting Abstract Machines**. With Matthew Might. In *Proceedings of the 15th ACM SIGPLAN International Conference on Functional Programming (ICFP'10)*, Baltimore, Maryland, September, 2010.

Implementing Call-By-Need on the Control Stack. With Stephen Chang and Matthias Felleisen. In *Symposium on Trends in Functional Programming (TFP'10)*, Norman, Oklahoma, May, 2010. Winner of the best student paper award.

Publications: Journals and conferences (continued)

Resolving and Exploiting the k-CFA Paradox: Illuminating Functional vs. Object-Oriented Program Analysis. With Matthew Might and Yannis Smaragdakis. In *Proceedings of the ACM SIGPLAN 2010 Conference on Programming Language Design and Implementation (PLDI'10)*, Toronto, Canada, June, 2010.

2008 **Deciding kCFA is complete for EXPTIME**, with Harry G. Mairson. In *Proceedings of the 13th ACM SIGPLAN International Conference on Functional Programming (ICFP'08)*, Victoria, British Columbia, Canada, September, 2008.

Flow Analysis, Linearity, and PTIME, with Harry G. Mairson. In *The 15th International Static Analysis Symposium (SAS 2008)*, Valencia, Spain, July, 2008. Lecture Notes in Computer Science, 5079.

Types and Trace Effects of Higher Order Programs, with Christian Skalka and Scott Smith. *Journal of Functional Programming* **18**(2), March, 2008.

2007 **Relating Complexity and Precision in Control Flow Analysis**, with Harry G. Mairson. In *Proceedings of the Twelth ACM SIGPLAN International Conference on Functional Programming (ICFP'07)*, Freiburg, Germany, October, 2007.

Publications: Workshops and others

2016 **Tutorial: An Introduction to Redex with Abstracting Abstract Machines**. In *Tutorials at The 43rd ACM SIGPLAN-SIGACT Symposium on Principles in Programming Languages (POPL'16)*, St. Petersburg, Florida, January 2016.

2013 **Sound and Precise Malware Analysis for Android via Pushdown Reachability and Entry-Point Saturation**, with Shuying Liang, Andrew Keep, Matthew Might, Steven Lyde, Thomas Gilray, and Petey Aldous. In *ACM CCS Workshop on Security and Privacy in Smartphones and Mobile Devices (SPSM)*, Berlin, Germany, November 2013.

Static Contract Checking for Scripting Languages, with Phuc C. Nguyen and Sam Tobin-Hochstadt. http://arxiv.org/abs/1307.6239

From Principles to Practice with Class in the First Year, with Sam Tobin-Hochstadt. In *International Workshop on Trends in Functional Programming in Education*, Provo, Utah, May 2013.

Concrete Semantics for Pushdown Analysis: The Essence of Summarization, with J. Ian Johnson. In *Workshop on Higher-Order Program Analysis*, New Orleans, Louisiana, June 2013.

AnaDroid: Malware Analysis of Android with User-supplied Predicates, with Shuying Liang and Matthew Might. In *Workshop on Tools for Automatic Program Analysis*, Seattle, Washington, June 2013.

2011 **Semantic Solutions to Program Analysis Problems**, with Sam Tobin-Hochstadt. In *The The ACM SIGPLAN 2011 Conference on Programming Language Design and Implementation (PLDI'11)*, FIT Session, San Jose, California, June 2011.

Publications: Workshops and others (continued)

2010 **Pushdown Control-Flow Analysis of Higher-Order Programs**, with Christopher Earl and Matthew Might. In *The 2010 Workshop on Scheme and Functional Programming (SFP'10)*, Montréal, Québec, Canada, August, 2010.

2009 **The Complexity of Flow Analysis in Higher-Order Languages**. Ph.D. dissertation, Brandeis University, August, 2009.

2008 **A Few Principles of Macro Design**, with David Herman. In *The ACM Workshop on Scheme and Functional Programming*, Victoria, British Columbia, Canada, September, 2008.

2006 **Algorithmic Trace Effect Analysis**. Masters thesis, University of Vermont, May, 2006.

2005 **A Type and Effect System for Flexible Abstract Interpretation of Java**, with Christian Skalka and Scott Smith. In *Proceedings of the ACM Workshop on Abstract Interpretation of Object-Oriented Languages (AIOOL'05)*, Electronic Notes in Theoretical Computer Science. Volume 131, January, 2005.

Publications: Books

2013 **Realm of Racket**, with Matthias Felleisen, Conrad Barski, and Northeastern undergraduates: Forrest Bice, Rose DeMaio, Spencer Florence, Feng-Yun Mimi Lin, Scott Lindeman, Nicole Nussbaum, Eric Peterson, Ryan Plessner. Published by No Starch Press.

Students: Post-doctoral Advising

2017– Niki Vazou, Basili Fellow
2016– Thomas Gilray, Basili Fellow
2015–2017 Shiyi Wei; now an assistant professor at the University of Texas at Dallas
2014–2016 Neil Toronto; now at MSR, Cambridge
2014–2015 Matthew Hammer; now an assistant professor at University of Colorado

Students: PhD Advising

2015–2017 David Darais, *Mechanizing Abstract Interpretation*; now an assistant professor at the University of Vermont
2014– Nicholas Labich
2014– Phuc C. Nguyen

Students: PhD Committees

2017 Kristopher Micinski, *Interaction-Based Privacy Policies for Mobile Apps*, UMD; now a visiting assistant professor at Haverford College
2016 Brianna Ren, Proposal: *Just-in-Time Static Type Checking and Inference for Dynamic Languages*, UMD
2015 Piotr Mardziel, *Modeling, Measuring, and Limiting Adversary Knowledge*, UMD; now a post-doc at CMU
2015 Dionna Glaze, *Automating Abstract Interpretation of Abstract Machines*, Northeastern University; now at Google
2015 Vincent St-Amour, *How to Generate Actionable Advice about Performance Problems*, Northeastern University; now a research associate at Northwestern University

Students: PhD Committees (continued)

2014	Stephen Chang, *On the Relation Between Laziness and Strictness*, Northeastern University; now a lecturer at Northeastern University
2014	Shuying Liang, *Static Analysis of Android Applications*, University of Utah; now at HP Fortify

Students: Undergraduate Advising

2017–	William Kunkel
2014–2015	Kyle Headley; now a PhD student at University of Colorado

Teaching

University of Maryland

2014–2015	Program Analysis and Understanding, CMSC 631 (40)
2015–2017	Compilers, CMSC 430 (90)
2017	Systematic Program Design I, CMSC 131A (140)
2018	Systematic Program Design II, CMSC 132A (75)

Northeastern University

2007–2010	Intro. to Programming and Computing I (247)
2009–2011	Intro. to Programming and Computing I, Honors (134)
2008–2009, 2012–2013	Intro. to Programming and Computing II (312)
2011–2013	Intro. to Programming and Computing II, Honors (110)

Service: External

Journal, editor

2016	Journal of Functional Programming, Special Issue for "Best of ICFP 2015"

Journal, referee

ACM Computing Surveys
ACM Transactions on Computational Logic
ACM Transactions on Programming Languages and Systems
Higher-Order and Symbolic Computation
Journal of Functional Programming
Science of Computer Programming

Steering committee

2013–2016	ACM SIGPLAN International Conference on Functional Programming (ICFP)
2014	Workshop on Higher-Order Program Analysis (HOPA)

Chair

2018	Programming Languages Mentoring Workshop at ICFP (PLMW)
2016	Symposium on Trends in Functional Programming (TFP)
	ACM Student Research Competition at ICFP
2014	Workshop on Higher-Order Program Analysis (HOPA)
2011	NII Workshop on Automated Techniques for Higher-Order Program Verification
	New England Programming Languages and Systems Symposium (NEPLS)

Service: External (continued)

Panelist

2011 NSF Directorate for Computer & Information Science & Engineering (CISE)
2010 NSF Directorate for Computer & Information Science & Engineering (CISE)

Program committee

2018 International Symposium on Practical Aspects of Declarative Languages (PADL)
2017 ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages (POPL)
Static Analysis Symposium (SAS)
Symposium on Trends in Functional Programming (TFP)
2016 European Conference on Object-Oriented Programming (ECOOP)
ACM SIGPLAN Conference on Systems, Programming, Languages and Applications: Software for Humanity (SPLASH) Posters
2015 ACM SIGPLAN International Conference on Functional Programming (ICFP)
Off the Beaten Track: New Frontiers for Programming Languages Research (OBT)
2014 European Symposium on Programming (ESOP)
International Symposium on Practical Aspects of Declarative Languages (PADL)
Workshop on Syntax and Semantics of Low-Level Languages (LOLA)
Symposium on Trends in Functional Programming (TFP)
International Workshop on Trends in Functional Programming in Education (TFPIE)
2013 Scala Workshop
Workshop on Higher-Order Program Analysis (HOPA)
2012 Symposium on Trends in Functional Programming (TFP)
2011 ACM SIGPLAN International Conference on Functional Programming (ICFP)
Scheme and Functional Programming Workshop
2009 Scheme and Functional Programming Workshop

External review committee

2018 ACM SIGPLAN International Conference on Functional Programming (ICFP)
2016 ACM SIGPLAN International Conference on Functional Programming (ICFP)
ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages (POPL)
2013 ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages (POPL)

Reviewer

2017 ACM SIGPLAN Conference on Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA)
2016 International Conference on Verification, Model Checking, and Abstract Interpretation (VMCAI)
2015 ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages (POPL)
2014 ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages (POPL)
International Conference on Verification, Model Checking, and Abstract Interpretation (VMCAI)
ACM SIGPLAN International Conference on Functional Programming (ICFP)
ACM SIGPLAN Symposium on Dynamic Languages (DLS)
2012 ACM SIGPLAN Conference on Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA)
Dynamic Languages Symposium (DLS)
2011 European Symposium on Programming Languages (ESOP)
2010 ACM SIGPLAN International Conference on Functional Programming (ICFP)
2008 ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages (POPL)
2007 IEEE Symposium on Logic in Computer Science (LICS)

Service: External (continued)

EACSL Conference on Computer Science and Logic (CSL)

Other

2018	ACM Student Research Competition at PLDI, Committee member
	ACM Student Research Competition at ICFP, Committee member
2015	ACM Student Research Competition at ICFP, Committee member
2013–2016	ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages (POPL), Workshop chair
2012	New England Programming Languages and Systems Symposium (NEPLS), Speaker selection committee.

Service: Internal

2014–2016	Graduate Admissions Committee.
2015–2016	Graduate Student Review Committee.
2015–2016	Iribe Center Space Committee.
2015	Grad School Panel for first-year PhD students.
2015	Organizer: "Is Grad School Right for Me?" event for undergraduates.
2012	(Northeastern) CS3500 Committee, with Javed Aslam and William D Clinger, charged with reviewing the CS3500 (*Object-Oriented Design*) cirriculum, with the end goal of revising CS3500 in such a way that (a) it retains the best aspects of the current object-oriented design course, (b) it does not excessively and unnecessarily overlap with CS2510 (*Fundamentals 2*), and (c) it contains substantially more algorithmic content.

Talks

2017	**Redex, Abstract Machines, and Abstract Interpretation**, Invited lectures at the Oregon Programming Languages Summer School (OPLSS), University of Oregon, Eugene, Oregon, July 2017.
2016	**Tutorial: Introduction to Redex with Abstracting Abstract Machines**, Tutorials at the ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages (POPL), January 2016. **Verification and Refutation of Behavioral Contracts with Higher-Order Symbolic Execution**, PLEAID Seminar, University of Chile, Santiago, Chile, January 2016. **Tutorial: Introduction to Redex with Abstracting Abstract Machines**, PLEAID Seminar, University of Chile, Santiago, Chile, January 2016.
2015	**Verification and Refutation of Behavioral Contracts with Higher-Order Symbolic Execution**, CS Seminar, Johns Hopkins University, Baltimore, Maryland, October 2015. **Young Researcher Panel**, ACM SIGPLAN Programming Languages Mentoring Workshop at ICFP, Vancouver, British Columbia, August 2015. **Abstracting Abstract Machines**, PLT Redex Summer School, University of Utah, Salt Lake City, Utah, July 2015. **Verification and Refutation of Behavioral Contracts with Higher-Order Symbolic Execution**, PL Wonks Seminar, Indiana University, Bloomington, Indiana, January 2015.
2014	**Soft Contract Verification**, Dagstuhl Seminar on Scripting Languages and Frameworks: Analysis and Verification, Schloss Dagstuhl, Germany, July 2014.

Talks (continued)

Analysis for Trustworthy Software, Third Annual Maryland Cybersecurity Center Symposium, College Park, Maryland, June 2014.
Soft Contract Verification, NII Workshop on Software Contracts for Communication, Monitoring, and Security, Shonan Village, Japan, May 2014.
Synthesis from Contracts, Defense Advanced Research Projects Agency, Arlington, Virginia, March 2014.
Program Analysis for Trustworthy Software, Laboratory for Telecommunication Sciences, College Park, Maryland, March 2014.

2013 **From Principles to Practice with Class Trends in Functional Programming in Education**, Provo, Utah, May 2013.
Abstracting Definitional Interpreters, Mid-Atlantic Programming Languages Seminar, College Park, Maryland, April 2013.
Analysis for Trustworthy Software, Computer Science Colloquium, University of Maryland, College Park, Maryland, March 2013.

2012 **Analyzing Software Contracts**, DARPA Clean-slate design of Resilient Adaptive Secure Hosts meeting, Boston, Massachusetts, December 2012.
Towards the Verification of Behavioral Software Contracts, Microsoft Research, RiSE Group invited lecture, Redmond, Washington, November 2012.
Raising the Level of Discourse with GnoSys, DARPA Clean-slate design of Resilient Adaptive Secure Hosts PI Meeting, San Diego, California, November 2012.
Program Verification via Abstract Reduction Semantics, **Optimized Machines for Program Analysis**, **Abstract Machines for Program Analysis**Invited lectures, Harvard University, Advanced Functional Language Compilation, Cambridge, Massachusetts, November 2012.
Scalable Abstractions for Trustworthy Software, DARPA Automated Program Analysis for Cybersecurity PI Meeting, Arlington, Virginia, October, 2012.

2011 **Low-level Analysis for High-level Assurance**, GnoSys project report for DARPA CRASH, Boston, Massachusetts, October, 2011.
Verification via Abstract Reduction, NII Workshop on Automated Techniques for Automated Higher-order Program Verification, Shonan Village, Japan, September, 2011.
The Complexity of *k*CFA, NII Workshop on Automated Techniques for Automated Higher-order Program Verification, Shonan Village, Japan, September, 2011.
What Program Analysis Can and Cannot Do for You, Rice University CS Colloquium, Houston, Texas, March, 2011.
What Program Analysis Can and Cannot Do for You, University of Utah CS Colloquium, Salt Lake City, Utah, February, 2011.
The Paradox of Flow Analysis, Or: What We Talk About When We Talk About Higher-Order Flow Analysis, MIT Programming Languages Working Group, MIT, Cambridge, Massachusetts, February, 2011.

2010 **Modular Analysis via Abstract Reduction Semantics**, New Jersey Programming Languages and Systems Symposium, Rutgers University, Piscataway, New Jersey, December 2010.
Pushdown Control-Flow Analysis of Higher-Order Programs, IBM Programming Languages Day, Hawthorne, New York, July 2010.
Abstracting Abstract Machines: Storing and Stacking Continuations, Harvard Programming Languages Seminar, Harvard University, Cambridge, Massachusetts, July 2010.
Abstracting Abstract Machines, New England Programming Languages and Systems Symposium, Yale University, New Haven, Connecticut, April 2010.

Talks (continued)

Resolving and Exploiting the *k*-CFA Paradox, University of Oregon CIS Colloquium, Eugene, Oregon, April 2010.

2009 **Resolving and Exploiting the *k*-CFA Paradox**, New England Programming Languages and Systems Symposium, MIT, Cambridge, Massachusetts, December 2009.
Subcubic Control-Flow Analysis Algorithms, ACM Symposium in Honor of Mitchell Wand, Northeastern University, Boston, Massachusetts, August 2009.
The Complexity of Flow Analysis in Higher-Order Languages, Ph.D. defense, Brandeis University, Waltham, Massachusetts, July 2009.

2008 **The Complexity of Flow Analysis**, New England Programming Languages and Systems Symposium, Harvard University, Boston, Massachusetts, November 2008.
The Complexity of Flow Analysis, Northeastern UniversityGraduate Programming Languages Seminar, Boston, Massachusetts, October 2008.

2007 **Relating Complexity and Precision in Control Flow Analysis**, Northeastern University, Programming Languages Seminar, Boston, Massachusetts, May 2007.
Relating Complexity and Precision in Control Flow Analysis, IBM Programming Languages Day, Hawthorne, New York, May 2007.

2006 **Linearity and Program Analysis**, Northeastern University, Graduate Programming Languages Seminar, Boston, Massachusetts, October 2006.
Algorithmic Trace Effect Analysis, MS thesis defense, University of Vermont, March 2006.

2005 **Abstract Machines for the Multi-return λ-calculus**, Northeastern University, "Principles of Programming Languages" graduate seminar, December 2005.
Algorithmic Trace Effect Analysis, University of Vermont CS Research Day, August 2005.
Context Based Security in Programming Languages, Vermont EPSCoR conference, August 2005.

Honors & Awards

2013 **Northeastern University Excellence in Teaching Award Nominee**.

2011 **Communications of the ACM, Research Highlight**.
2009—2011 **Computing Innovation Fellow**, CRA/CCC with funding from the NSF.
2009 **ACM Doctoral Dissertation Award Nominee**.
2004—2005 **Upsilon Pi Epsilon International Computer Science Honor Society**.
2003—2004 **ACM Faculty Award**, College of Engineering & Mathematics, University of Vermont.