Michael W. Hicks

September 30, 2025

Contact Information

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Education

BS, with honors, Pennsylvania State University 1993 (Computer Science).

MS, University of Pennsylvania 1996 (Computer and Information Science).

PhD, University of Pennsylvania August, 2001 (Computer and Information Science).

Appointments

Senior Principal Applied Scientist (January 2022–present), Amazon Web Services

Professor Emeritus (January 2023–present), Computer Science, University of Maryland.

Chief Technology Officer (September 2018–December 2021), Correct Computation, Inc.

Professor (July 2013–December 2022), Computer Science, University of Maryland.
 (Assistant and Associate professor from July 2002-2013.)

Associate Co-Chair for Undergraduate Education (September 2017–December 2021), Department of Computer Science, University of Maryland.

Consultant (August–November 2020) Covington and Burling, LLP.

Consultant (June 2019–July 2020), Stealth Software Technologies, Inc.

Consultant and testifying witness (February 2014–2017), Wilson Sonsini Goodrich and Rosati.

Visiting Researcher (June 2015–Aug. 2015), Microsoft Research, Redmond.

Director (October 2011–2013), Maryland Cybersecurity Center, University of Maryland.

Affiliate Faculty (2005–2011), Electrical Engineering, University of Maryland.

Adjunct (2006–2015), Institute for Defense Analyses Center for Computing Sciences, Bowie, MD.

Visiting Researcher (Sep. 2008–Nov. 2008), Microsoft Research, Cambridge, the United Kingdom.

Post-doctoral Research Associate (2001–2002), Computer Science, Cornell University, Ithaca, New York.

Scientist (1998–1999), NEC Research Institute, Princeton, New Jersey.

Software Engineer (1993–1996), ARINC, Inc.

Notable awards and service

Fellow of the ACM, named January 2023.

ACM SIGPLAN Chair, served 2015–2018; for the next 3 years I served as **Past Chair**. SIGPLAN is one of 30 special interests groups (SIGs) of ACM members, in this case with a focus on programming languages (PLAN). SIGPLAN hosts five high-profile conferences among a slate of 13. There are nearly 3,000 SIGPLAN members.

ACM SIGPLAN Distinguished Service Award, named June 2022, for contributions as SIGPLAN Chair and Past Chair, and for service on program committees and other SIGPLAN activities over the years.

Editor in Chief, *Proceedings of the ACM on Programming Languages (PACMPL)*, November 2022–2025. PACMPL is the journal that publishes the proceedings of the "big four" SIGPLAN conferences (POPL, PLDI, OOPSLA, ICFP).

University of Maryland Distinguished Scholar-Teacher, 2015–2016. This award is given to about five University of Maryland faculty each year, from among the 1,500 across all Departments on campus, who demonstrate remarkable achievement in both research and teaching.

Department of Computer Science Faculty Teaching Award, 2003, 2005, 2007, 2014.

NSF CAREER Award, 2004.

Program committee (PC) Chair and member of high-profile conferences. First Program Chair of IEEE Cybersecurity Development Conference (SecDev), which focuses on building systems security, held November 2016; served on the SC and PC 2017–2019. Co-founder, Workshop on Programming Languages for Quantum Computing (PLanQC), 2020. Other PC memberships include IEEE Computer Security Foundations Symposium (2014, Chair 2015 & 2016), IEEE Symposium on Security and Privacy (PC member 2009, 2015, 2017, 2022, 2025, Area Chair 2018), ACM Conference on Computer and Communications Security (PC member, 2008 and 2017, Area Chair 2019), ACM SIGPLAN Symposium on Principles of Programming Languages (PC member 2009 & 2024, Chair 2012, SC Chair 2018–2021), ACM SIGPLAN Conference on Programming Language Design and Implementation (PC member, 2007, 2013, 2016, Area Chair 2023).

Associate Editor, Transactions on Programming Languages and Systems (TOPLAS), January 2012–2017.

Member, National Academy of Sciences committee on Enhancing the Assurance and Nimbleness of Large-Scale Integrated Software-Based Systems, November 2023–present.

Member, DARPA Information Science and Technology Board (ISAT), September 2009–2012. This panel consists of 30 individuals (largely faculty and researchers) from U.S. institutions which advises DARPA by conducting studies on topics of increasing relevance and impact. I co-led a study that spurred the creation of a DARPA program (HACMS) and boosted synthesis research (mentioned as a "hot topic" at PLDI'22).

Member, CyberMaryland 2.0 Task Force, April–October 2012, Panel commissioned by the Maryland Department of Business and Economic Development (DBED) to explore how to increase Maryland's impact and standing in the cybersecurity arena.

Member, University System of Maryland Chancellor's Task Force on Cybersecurity, Nov 2010–Feb 2011.

Founder and member, SIGPLAN Committee on Empirical Evaluations. I founded the committee while SIGPLAN Chair, inspired by what I found with my fuzzing work. We produced a checklist of best practices at http://sigplan.org/Resources/EmpiricalEvaluation/

Founder and first editor in chief, PL Perspectives, the blog of the ACM Special Interest Group on Programming Languages (SIGPLAN), curating more than 90 articles. https://blog.sigplan.org

Scientific publications

Co-author of 153 peer-reviewed scientific papers

13803 citations and H-index of 57, per Google Scholar (https://scholar.google.com/citations?user=Gggzp7UAAAAJ&hl=en)

All papers at https://mhicks.me/papers/mwh.html

Papers in last 5 years, and other notables

(2025)

Aleks Chakarov, Jaco Geldenhuys, Matthew Heck, Michael Hicks, Sam Huang, Georges-Axel Jaloyan, Anjali Joshi, K. Rustan M. Leino, Mikael Mayer, Sean McLaughlin, Akhilesh Mritunjai, Clement Pit-Claudel, Sorawee Porncharoenwase, Marianna Rapoport, Cody Roux, Neha Rungta, Robin Salkeld, Matthias Schlaipfer, Daniel Schoepe, Johanna Schwartzentruber, Serdar Tasiran, Aaron Tomb, Jean-Baptiste Tristan, Emina Torlak, Lucas Wagner, Michael W. Whalen, Remy Willems, Tongtong Xiang, Tae Joon Byun, Joshua Cohen, Ruijie Fang, Junyoung Jang, Jakob Rath, Hira Taqdees Syeda, Dominik Wagner, and Yongwei Yuan. **Formally verified cloud-scale authorization.** In *Proceedings of the International Conference on Software Engineering (ICSE)*, April 2025. **Distinguished Paper**.

(2024)

Joseph W. Cutler, Craig Disselkoen, Aaron Eline, Shaobo He, Kyle Headley, Michael Hicks, Kesha Hietala, Eleftherios Ioannidis, John Kastner, Anwar Mamat, Darin McAdams, Matt McCutchen, Neha Rungta, Emina Torlak, and Andrew Wells. **Cedar: A new language for expressive, fast, safe, and analyzable authorization.** In *Proceedings of the ACM Conference on Object-Oriented Programming Languages, Systems, and Applications (OOPSLA)*, April 2024.

Craig Disselkoen, Aaron Eline, Shaobo He, Kyle Headley, Michael Hicks, Kesha Hietala, John Kastner, Anwar Mamat, Matt McCutchen, Neha Rungta, Bhakti Shah, Emina Torlak, and Andrew Wells. **How we built Cedar: A verification-guided approach.** In *Proceedings of the European Software Engineering Conference and the ACM SIGSOFT Symposium on the Foundations of Software Engineering (ESEC/FSE)*, July 2024. Industry papers track.

(2023)

Kesha Hietala, Robert Rand, Liyi Li, Shih-Han Hung, Xiaodi Wu, and Michael Hicks. **A verified optimizer for quantum circuits.** *ACM Transactions on Programming Languages and Systems (TOPLAS)*, July 2023. Extends POPL'21 paper.

Yuxiang Peng, Kesha Hietala, Runzhou Tao, Liyi Li, Robert Rand, Michael Hicks, and Xiaodi Wu. **A formally certified end-to-end implementation of Shor's factorization algorithm.** *Proceedings of the National Academy of Sciences*, 120(21), May 2023.

Jie Zhou, John Criswell, and Michael Hicks. **Fat pointers for temporal memory safety of C.** In *Proceedings of the ACM Conference on Object-Oriented Programming Languages, Systems, and Applications (OOPSLA)*, April 2023.

Haowei Deng, Yuxiang Peng, Michael Hicks, and Xiaodi Wu. **Automating NISQ application design with meta quantum circuits with constraints (MQCC).** *ACM Transactions on Quantum Computing (TQC)*, 4(3), April 2023.

Zenong Zhang, George Klees, Eric Wang, Michael Hicks, and Shiyi Wei. **Fuzzing configurations of program options.** *ACM Transactions on Software Engineering and Methodology (TOSEM)*, 32(2), March 2023. A shorter version appeared at the 2022 Fuzzing Workshop.

Michael Coblenz, April Porter, Varun Das, Teja Nallagorla, and Michael Hicks. **A multimodal study of challenges using Rust.** In *Proceedings of the Workshop on the Evaluation and Usability of Programming Languages and Tools (PLATEAU)*, February 2023.

Ian Sweet, David Darais, David Heath, Ryan Estes, Bill Harris, and Michael Hicks. **Symphony: Expressive secure multiparty computation with coordination.** ⟨*Programming*⟩, 7(14), February 2023.

Finn Voichick, Robert Rand, and Michael Hicks. **Qunity: A unified language for quantum and classical computing.** In *Proceedings of the ACM Conference on Principles of Programming Languages (POPL)*, January 2023.

(2022)

Liyi Li, Finnegan Voichick, Kesha Hietala, Yuxiang Peng, Xiaodi Wu, and Michael Hicks. **Verified compilation of quantum oracles.** In *Proceedings of the ACM Conference on Object-Oriented Programming Languages, Systems, and Applications (OOPSLA)*, December 2022.

Aravind Machiry, John Kastner, Matt McCutchen, Aaron Eline, Kyle Headley, and Michael Hicks. **C to Checked C by 3C.** In *Proceedings of the ACM Conference on Object-Oriented Programming Languages, Systems, and Applications (OOPSLA)*, December 2022. **Distinguished Paper**.

Kelsey R. Fulton, Daniel Votipka, Desiree Abrokwa, Michelle L. Mazurek, Michael Hicks, and James Parker. **Understanding the how and the why: Exploring secure development practices through a course competition.** In *Proceedings of the ACM Conference on Computer and Communications Security (CCS)*, October 2022.

Liyi Li, Yiyun Liu, Deena L. Postol, Leonidas Lampropoulos, David Van Horn, and Michael Hicks. **A formal model of Checked C.** In *Proceedings of the Computer Security Foundations Symposium (CSF)*, August 2022.

Michael Coblenz, Michelle Mazurek, and Michael Hicks. **Does the bronze garbage collector make rust easier to use? a controlled experiment.** In *Proceedings of the International Conference on Software Engineering (ICSE)*, May 2022. **Distinguished Paper Award Nominee**.

(2021)

Kelsey Fulton, Anna Chan, Dan Votipka, Michael Hicks, and Michelle Mazurek. **Benefits and drawbacks of adopting a secure programming language: Rust as a case study.** In *Proceedings of the Symposium on Usable Privacy and Security (SOUPS)*, August 2021.

Zenong Zhang, Zach Patterson, Michael Hicks, and Shiyi Wei. **Fixreverter: A realistic bug injection methodology for benchmarking fuzz testing.** In *Proceedings of the USENIX Security Symposium (USENIX SEC)*, August 2022. **Distinguished Paper**.

Souvik Bhattacherjee, Gang Liao, Michael Hicks, and Daniel J. Abadi. **Bullfrog: Online schema evolution via lazy evaluation.** In *Proceedings of the ACM SIGMOD International Conference on Management of Data (SIGMOD)*, June 2021.

Kesha Hietala, Liyi Li, Akshaj Gaur, Aaron Green, Robert Rand, Xiaodi Wu, and Michael Hicks. **Applying and expanding the VOQC toolkit.** In *Informal Proceedings of the Workshop on Programming Languages and Quantum Computing (PLanQC)*, June 2021.

Kesha Hietala, Robert Rand, Shih-Han Hung, Liyi Li, and Michael Hicks. **Proving quantum programs correct.** In *Proceedings of the Conference on Interative Theorem Proving (ITP)*, June 2021.

Ian Sweet, David Darais, David Heath, Ryan Estes, William Harris, and Michael Hicks. **Symphony: A concise language model for MPC.** In *Informal Proceedings of the Workshop on Foundations on Computer Secuirty (FCS)*, June 2021.

Finn Voichick and Michael Hicks. **Toward a quantum programming language for higher-level formal verification.** In *Informal Proceedings of the Workshop on Programming Languages and Quantum Computing (PLanQC)*, June 2021.

Zenong Zhang, George Klees, Eric Wang, Michael Hicks, and Shiyi Wei. **Fuzzing configurations of program options.** In *Proceedings of the International Fuzzing Workshop*, April 2022.

Kesha Hietala, Robert Rand, Shih-Han Hung, Xiaodi Wu, and Michael Hicks. **A verified optimizer for quantum circuits.** In *Proceedings of the ACM Conference on Principles of Programming Languages (POPL)*, January 2021. **Distinguished Paper**.

(Other notable publications)

Daniel Votipka, Kelsey Fulton, James Parker, Matthew Hou, Michelle L. Mazurek, and Michael Hicks. **Understanding security mistakes developers make: Qualitative analysis from Build It, Break It, Fix It.** In *Proceedings of the USENIX Security Symposium (USENIX SEC)*, August 2020. **Distinguished Paper**.

George T. Klees, Andrew Ruef, Benjamin Cooper, Shiyi Wei, and Michael Hicks. **Evaluating Fuzz Testing.** In *Proceedings of the ACM Conference on Computer and Communications Security (CCS)*, October 2018. **NSA Best Scientific Cybersecurity Paper 2018**.

Chang Liu, Austin Harris, Martin Maas, Michael Hicks, Mohit Tiwari, and Elaine Shi. **Ghostrider: A hardware-software system for memory trace oblivious computation.** In *Proc. of the International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS)*, March 2015. **Best Paper**.

Christopher M. Hayden, Karla Saur, Edward K. Smith, Michael Hicks, and Jeffrey S. Foster. **Efficient, general-purpose dynamic software updating for C.** *ACM Transactions on Programming Languages and Systems (TOPLAS)*, 36(4):13, October 2014.

Aseem Rastogi, Matthew A. Hammer, and Michael Hicks. **Wysteria: A programming language for generic, mixed-mode multiparty computations.** In *Proc. of the IEEE Symposium on Security and Privacy (Oakland)*, May 2014.

Chang Liu, Michael Hicks, and Elaine Shi. **Memory trace oblivious program execution.** In *Proc. of the Computer Security Foundations Symposium (CSF)*, June 2013. **NSA Best Scientific Cybersecurity Paper 2013**.

Yit Phang Khoo, Jeffrey S. Foster, and Michael Hicks. **Expositor: Scriptable Time-Travel Debugging with First Class Traces.** In *Proceedings of the International Conference on Software Engineering (ICSE)*, May 2013.

Kin-Keung Ma, Yit Phang Khoo, Jeffrey S. Foster, and Michael Hicks. **Directed Symbolic Execution.** In Eran Yahav, editor, *Proceedings of the Static Analysis Symposium (SAS)*, volume 6887 of *Lecture Notes in Computer Science*, pages 95-111. Springer, September 2011.

Saurabh Srivastava, Michael Hicks, Jeffrey S. Foster, and Patrick Jenkins. **Modular Information Hiding and Type Safe Linking for C.** *IEEE Transactions on Software Engineering (TSE)*, 34(3):1-20, May 2008.

Nick L. Petroni, Jr. and Michael Hicks. **Automated detection of persistent kernel control-flow attacks.** In *Proc. of the ACM Conference on Computer and Communications Security (CCS)*, October 2007.

Nikhil Swamy, Michael Hicks, Greg Morrisett, Dan Grossman, and Trevor Jim. **Safe manual memory management in Cyclone.** *Science of Computer Programming (SCP)*, 62(2):122–144, October 2006. Special issue on memory management. *Key ideas now embodied in the Rust programming language.*

Trevor Jim, Greg Morrisett, Dan Grossman, Michael Hicks, James Cheney, and Yanling Wang. **Cyclone: A safe dialect of C.** In *Proc. of the USENIX Annual Technical Conference*, June 2002.

Dan Grossman, Greg Morrisett, Trevor Jim, Michael Hicks, Yanling Wang, and James Cheney. **Region-based memory management in Cyclone.** In *Proc. of the ACM Conference on Programming Language Design and Implementation (PLDI)*, pages 282–293. ACM, June 2002.

Michael Hicks. *Dynamic Software Updating*. PhD thesis, Department of Computer and Information Science, University of Pennsylvania, August 2001. **ACM SIGPLAN Doctoral Dissertation Award 2002.**

Patents

Emina Torlak, Kyle Headley, Michael W. Hicks, Neha Rungta, Andrew Marshall Wells. **Authorization Policy Analysis**. US12425455B2, United States Patent and Trademark Office, Sep. 23, 2025.

Michael W. Hicks, John Holman Kastner, Emina Torlak, Richard Matthew McCutchen, Darin McAdams, Neha Rungta, Aaron Joseph Eline, Joseph Wallace Cutler, Eleftherios Ioannidis. **Authorization policy validation**. US20240179182A1, United States Patent and Trademark Office, March 25, 2025.

Michael W. Hicks, B. S. Lavender, Anwar Mamat, and Ian Nicholas Sweet. **Automated generation of source code models from machine code for code analysis**. US11321218B1, United States Patent and Trademark Office, May 5, 2022.

Notable invited talks

Cedar: A language for expressing fast, safe, and fine-grained authorization policies

- UPenn CIS Colloquium, Nov 2024.
- Invited talk, Cylab Seminar, Carnegie Mellon University, Feb 2024.
- Distinguished lecture, Dept of CS, Iowa State University, Nov 2023.

Contesting Secure Software Development

- Invited speaker, ISAT/DARPA RAPIDS Workshop, March 2023.

- Keynote, Computer Security Foundations Symposium, June 2020.
- UPenn CIS Colloquium, Nov 2019.

From Verified Compilation to Shor's Algorithm. Keynote, Second International Workshop on Programming Languages for Quantum Computing (PLanQC 2021), June 2021.

Evaluating Fuzz Testing

- Keynote, Meeting on Hot Topics on the Science of Security (HotSOS), Sep 2020.
- Best scientific cybersecurity paper award acceptance talk, National Security Agency, Oct 2019.
- Invited lecture, 9th International Summer School on Information Security and Protection, Canberra, Australia, July 2018.
- Keynote, Cornell Programming Languages Retreat, Sep 2018.
- Colloquium talk, EPFL Department of Computer and Communications Sciences, Lausanne, Switzerland, Oct 2018.

Building Security In: Programming Language-based Techniques for Ensuring Software Security. Invited lecture, 9th International Summer School on Information Security and Protection, Canberra, Australia, July 2018.

Languages for Oblivious Computation. Keynote talk at the ACM Workshop on Programming Languages and Analyses for Security (PLAS), co-located with the ACM SIGSAC Conference on Computer and Communications Security (CCS), Oct 2017.

Programming Languages Meet Cryptography. Series of three invited lectures at the Cornell, Maryland, Max Planck Pre-doctoral Research School, August 8-13, 2017 in Saarbruecken, Germany.

Tackling Software Insecurity with Abstract Interpretation. Invited talk, Workshop on the Next 40 Years of Abstract Interpretation (N40AI), collocated with POPL, Jan 2017.

Authenticated Data Structures, Generically. Colloquium talk, Max Planck Institute for Software Systems (MPI-SWS), Saarbrucken, Germany, Dec 2014.

Memory-Trace Oblivious Program Execution. NSA Best Scientific Cybersecurity Award Paper presentation, Sep 2014.

On-line patching for better security, and other security challenges. Colloquium talk, Johns Hopkins Applied Physics Lab, May 2013.

Expositor: Scriptable time-travel debugging with first class traces. Colloquium talk, Max Planck Institute for Software Systems (MPI-SWS), Saarbrucken, Germany, Nov 2012.

Kitsune: Efficient, General-purpose Dynamic Software Updating for C. Colloquium talk, Johns Hopkins University, Department of Computer Science, Nov 2012.

Cybersecurity: Past, Present, Looking ahead. Keynote, Maryland Francis King Carey School of Law Symposium on *Cybersecurity: Safeguarding Information in a Digital Age*, March 2012.

Dynamic Enforcement of Knowledge-based Security Policies. Colloquium talk, George Washington University, March 2012

Dynamic inference of static types for Ruby. Colloquium talk, Department of Computer Science, Cornell University, Oct 2011

Software Synthesis for cost-effective development of correct, efficient software. ISAT outbrief to DARPA program managers and the deputy director on October 4, 2011. I co-chaired this ISAT study with Armando Solar-Lezama of MIT.

Practical Dynamic Software Updating for C

- Colloquium talk, University of Kent at Canterbury Computer Laboratory, Mar 2009.

- Colloquium talk, University of Cambridge Computer Laboratory, Oct 2008.
- Colloquium talk, Department of Computer Science, the University of Virginia, Dec 2006.
- Colloquium talk, Department of Computer Science, the Pennsylvania State University, Nov 2005.

SELINKS: A language for provably secure web applications. Distinguished Lecturer talk, IBM T.J. Watson Research Laboratory, July 2007.

LOCKSMITH: Context-sensitive Correlation Analysis for Detecting Races. Colloquium talk, Department of Computer Science, University of Massachusetts (Amherst), Nov 2006.

Static Analysis to Improve Software Quality (with Jeff Foster), National Research Council of Canada, Institute for Information Technology invited talk, June 2006.

Safe and Flexible Memory Management in Cyclone. Colloquium talk, Department of Computer Science, Purdue University, Aug 2003.

Dynamic Software Updating. Colloquium talk, The Computer Laboratory at Cambridge University, Cambridge, England, Oct 2001.

PhDs and postdoctoral researcher advisees

I have supervised 13 postdoctoral researchers, and advised, co-advised, or served on the committees of 65 graduate students at UMD and elsewhere. PhD students and postdocs I closely and personally mentored are given below.

Liyi Li, Postdoc 2020–2023 (Assistant Professor, Iowa State University)

Ethan Cecchetti, Postdoc 2021–2022 (Assistant Professor, University of Wisconsin)

Michael Coblenz, Postdoc 2020–2022 (Assistant Professor, UCSD)

Kesha Hietala, PhD 2022 (Researcher, Sandia National Labs)

Ian Sweet, PhD 2022 (Software Research Engineer, Galois)

Robert Rand, Postdoc 2018–2020 (Assistant Professor, University of Chicago)

Leonidas Lampropoulos, Postdoc 2018–2020 (Assistant Professor, University of Maryland)

James Parker, PhD 2020 (Software Research Engineer, Galois)

Andrew Ruef, PhD 2018 (First job: Quantitative Researcher IDA/CCS)

Chang Liu, PhD 2016 (Researcher, Citadel Securities)

Shiyi Wei, Postdoc 2015–2017 (Associate Professor, University of Texas at Dallas)

Aseem Rastogi, PhD 2016 (Principal Researcher, Microsoft Research)

Luis Pina, PhD 2015 (Assistant Professor, University of Illinois Chicago)

Matthew Hammer, Postdoc 2013–2015 (First job: Assistant Professor, CU Boulder)

Karla Saur, PhD 2015 (Distributed Systems Engineer, Nvidia DGX Cloud)

Piotr Mardziel, PhD 2015 (First job: Systems Scientist, Carnegie Mellon)

Khoo Yit Phang, PhD 2013 (Software Engineering Manager, Mathworks)

Nataliya Guts, Postdoc 2011–2013 (Security Solutions Engineer, Futurae)

Chris Hayden, PhD 2012 (Senior Software Engineer, Amazon Web Services)

Stephen Magill, Postdoc 2010–2012 (VP, Product Innovation at Sonatype)

Justin McCann, PhD 2012 (Principal Software Engineering Manager, Microsoft)

Kin Keung (Martin) Ma, PhD 2011 (Software Engineer, Google)

Saurabh Srivastava, PhD 2010 (CEO and Founder, Consequent AI)

Pavlos Papageorge, PhD 2008 (Software Engineer, Google (AI))

Nikhil Swamy, PhD 2008 (Senior Principal Researcher, Microsoft)
Iulian Neamtiu, PhD 2008 (Professor, NJIT)
Polyvios Pratikakis, PhD 2008 (Associate Professor, University of Crete, Greece)
Nick L. Petroni, Jr., PhD 2008 (Chief Scientist, Volexity)
Manuel Oriol, Postdoc 2006–2008 (Professor, Constructor Institute of Technology, Switzerland)

Other notable mentoring activities

Undergraduate advising – mentored 36 UMD undergraduate students on research projects. Notables:

- Yiyun Liu (2018-2020) 2020 CRA outstanding undergraduate researcher, honorable mention. Now PhD student at UPenn.
- Andrew Ruef (2010-2013) and James Parker (2012-2013) later got PhDs with me.
- Ted Smith (2009-2013), co-authored 4 peer-reviewed papers on dynamic software updating.

High-school student project advising – mentored 9 students on summer projects. Notables:

- Akshaj Gaur (2020) co-authored workshop paper *Applying and Expanding the VOQC Toolkit*, now an MS student at UMD.
- George Klees (2017) first-authored paper *Evaluating Fuzz Testing* that won the NSA's Best Scientific Cybersecurity Paper competition in 2018.

Educational activities

(Courses taught at UMD)
CMSC 631, Program Analysis and Understanding, 30 students, Fall 2021.
CMSC 330, Organization of Programming Languages, 145 students, Spring 2021.
CMSC 330, Organization of Programming Languages, 145 students, Spring 2019.
CMSC 330, Organization of Programming Languages, 145 students, Spring 2018.
CMSC 631, Program Analysis and Understanding, 28 students, Fall 2017.
CMSC 330, Organization of Programming Languages, 215 students, Spring 2017.
CMSC 396H, Honors Seminar, 13 students, Fall 2016.
CMSC 838G, Mechanized Proof and Verified Software, 8 students, Spring 2016.
CMSC 330, Organization of Programming Languages, 129 students, Fall 2015.
CMSC 330, Organization of Programming Languages, 130 students, Spring 2015.
CMSC 433, Programming Language Technologies and Paradigms, 50 students, Fall 2014
CMSC 838G, Software Security, 10 students, Spring 2014
CMSC 433, Programming Language Technologies and Paradigms, 50 students, Fall 2013
CMSC 631, Program Analysis and Understanding, 26 students, Spring 2013
CMSC 330, Organization of Programming Languages, 113 students, Spring 2013
CMSC 498L, Cybersecurity lab (co-taught with 4 other profs), 25 students, Fall 2012
CMSC 498B, Secure Maryland (penetration testing), 7 students, Spring 2012
CMSC 631, Program Analysis and Understanding, 13 students, Fall 2011
CMSC 838G, Software Security, 5 students, Spring 2011
CMSC 433, Programming Language Technologies and Paradigms, 40 students, Fall 2010
CMSC 330, Organization of Programming Languages, 66 students, Spring 2010
CMSC 631, Program Analysis and Understanding, 9 students, Fall 2009
CMSC 631, Program Analysis and Understanding, 16 students, Fall 2007

CMSC 412, Operating Systems, 42 students, Spring 2007

CMSC 631, Program Analysis and Understanding, 20 students, Fall 2006

CMSC 433, Programming Language Technologies and Paradigms, 44 students, Spring 2006

CMSC 412, Operating Systems, 50 students, Fall 2005

CMSC 838Z, Language-based Security, 7 students, Spring 2005

CMSC 412, Operating Systems, 45 students, Fall 2004

CMSC 838Z, Tools and Techniques for Software Dependability, 8 students, Spring 2004

CMSC 433, Programming Language Technologies and Paradigms, 48 students, Fall 2003

CMSC 838Y, Agile and Adaptive Programming, 10 students, Spring 2003

CMSC 433, Programming Language Technologies and Paradigms, 47 students, Fall 2002

(Other teaching experiences)

Software Security - I developed a massively-open on-line course (MOOC) under the UMD-Coursera agreement, on this topic, as part of a specialization on cybersecurity. I fully developed the content for this course, including videos, lecture notes, and projects. See https://mhicks.me/software_security_course/index.html. When retired in December 2023, this course had had 70,000+ participants.

Cybersecurity Capstone – I developed the Capstone project for the UMD specialization on cybersecurity, based on our Build-it, Break-it, Fix-it contest. We hosted two capstones in 2015 and one in 2016. See https://builditbreakit.org

Grants, contracts, and gifts

Total of 34 grants awarded and industry gifts received, for a total of $15.875M raised.

AFOSR FA95502110051 Software Assurance for Quantum Programs, $218,875, January 2021-2024. PI: Michael Hicks. (This is part of a $506,651 multi-institutional grant with UChicago, and co-PI Robert Rand; UMD is the lead.)

NSF CCF-1955610: Collaborative Research: SHF: Medium: Bringing Python Up to Speed, $374,390, July 2020-2023. PI: Michael Hicks. (This is part of a $1.2M multi-institution grant with UPenn and UMass Amherst; UMD is the lead institution.)

Advancing Checked C, Microsoft Research Award (gift), $119,477. March 2019-December 2020. PI: Michael Hicks.

DARPA FA87501910008: Symbolic Input Unification and Minimization, $34,802, Nov 2018 – Dec 2018. PI: Michael Hicks.

NSF CNS-1801545 SaTC: CORE: Medium: Collaborative: Understanding Security in the Software Development Lifecycle: A Holistic, Mixed-Methods Approach, $698,957, Sep 2018 – 2022. Lead PI: Michelle Mazurek, co-PI: Michael Hicks. (This is part of a multi-institution grant with University of South Florida.)

DOE ASCR grant: Efficient and Reliable Mapping of Quantum Computations onto Realistic Architectures, $4,467,131, Sep 2018 – 2022. Lead PI: Andrew Childs. Co-PIs: Michael Hicks, Xiaodi Wu, Alexey Gorshkov.

Contesting Secure Development Effectiveness, Google Research Award (gift), $55,256. March 2017–2018. PI: Michelle Mazurek, co-PI: Michael Hicks.

NSF CNS-1563722 TWC: Medium: Collaborative: New Protocols and Systems for RAM-Based Secure Computation, $464,196. May 2016–2019. Lead PI: Jonathan Katz, co-PI: Michael Hicks. (This is part of a multi-institution grant with George Mason University.)

DARPA FA87501520104: SOUCIS: Sound Over- & Under-Approximations of Complexity & Information Security, $1,209,032. April 2015–2018. Lead PI: Michael Hicks, co-PI: David Van Horn and Jeffrey S. Foster. (This is part of a $2.52M multi-institution grant with UC Berkeley and Yale, each with one additional co-PI; UMD is the lead institution.)

DARPA FA8750-16-C-0022: TAMBA: Testing and Modeling of Brandeis Artifacts, $521,524. October 2015–October 2019. PI: Michael Hicks. (This is part of a multi-institution grant led by Galois, Inc.; Hicks is the only UMD PI.)

Connecting the Theory and Practice of Incremental Computation via Servo, gift from Mozilla Corporation, $88,294. May 2014–2015. co-PIs: Michael Hicks and Jeff Foster.

Boombox: Dynamic Software Updates for Software Defined Networks, Google Research Award (gift), $51,037. September 2014–2015. PI: Michael Hicks.

NSF CNS-1314857 TWC: Medium: Collaborative: DIORE: Digital Insertion and Observation Resistant Execution, $799,499. August 2013-2018. PI: Elaine Shi, co-PIs: Michael Hicks and Bobby Bhattacharjee. (This is part of a $1.2M multi-institution grant with one other PI at UT Austin. Bhattacharjee became UMD PI when Shi left UMD.)

NSF CNS-1111599 TC: Large: Collaborative Research: Practical Secure Two-Party Computation: Techniques, Tools, and Applications, $1M. August 2011-2018. PI: Jonathan Katz, co-PI: Michael Hicks. (This is part of a multi-institution grant, with UVA as lead institution.)

Establishing a Science of Security Research Lablet at the University of Maryland, NSA, $1,487,608. February 2014–February 2017. Lead PI: Jonathan Katz, co-PI: Michael Hicks (among 11 others).

Secure Information Flows in Hybrid Coalition Networks, US Army Research Lab and UK Ministry of Defence International Technology Alliance in Network and Information Science (USUKITA) program BPP15, $244,233 PI: Michael Hicks, co-PI Jonathan Katz. May 2015–2016.

NSF EDU-1319147 EDU: Competing to Build Secure Systems, $300,000. September 2013-2016. PI: Michael Hicks, co-PIs: Atif Memon, David M. Levin, and Jandelyn D. Plane.

Secure Information Flows in Hybrid Coalition Networks, US Army Research Lab and UK Ministry of Defence International Technology Alliance in Network and Information Science (USUKITA) program BPP13, $356,615 PI: Michael Hicks, co-PI Jonathan Katz. May 2013–2015.

University of Maryland Partnership with the Laboratory of Telecommunications Sciences, Contract Number H9823013D00560002, Protecting against Malware on Android, $371K. April 5, 2012–September 30, 2014. PI: Jeffrey S. Foster, co-PI: Michael Hicks.

NSF CCF-0910530 SHF: Large: Collaborative Research: Ever Ready: Perpetually Available Software Systems, $642K. August 2009–2014. PI: Michael Hicks. (This is part of a multi-institutional team grant with two other PIs for a total award of $2.3M.)

NSF CCF-0915978 SHF: Small: User-Centered Software Analysis Tools, $500K. September 2009– 2013. PI: Jeffrey S. Foster, co-PI: Michael Hicks.

Securing Information Flows, US Army Research Lab and UK Ministry of Defence International Technology Alliance in Network and Information Science (USUKITA) program BPP11, $333K. co-PIs: Michael Hicks and Jonathan Katz. May 2011–2013.

University of Maryland Partnership with the Laboratory for Telecommunications Sciences (LTS), Dynamic Software Update Automation for Servers and Event-Driven Programs, $407K. January 2010– 2013. PI: Michael Hicks, co-PI: Jeff Foster.

NSF CNS-0905419 RECOVERY: TC: Medium: Collaborative Research: Techniques to Retrofit Legacy Code with Security, $300K. September 2009–2012. PI: Michael Hicks. (This is part of a multi-institutional team grant with three other PIs for a total award of $1.2M.)

Improving the efficiency of static analysis of C source code using multiple tools, Cisco Systems Inc (Unrestricted gift), $35,000. 2007. PI: Jeffrey S. Foster, co-PI: Michael Hicks.

NSF CCF-0541036 Scalable, Precise, and Effective Analyses for Detecting Race Conditions, $360K. September 2006–2010. PI: Michael Hicks, co-PI: Jeffrey S. Foster.

US Army Research Lab and UK Ministry of Defence International Technology Alliance in Network and Information Science (USUKITA) program BPP09, $197K. co-PIs: Michael Hicks and Jonathan Katz. May 2009–2011.

NSF CNS-0346989 CAREER: Programming Languages for Reliable and Secure Low-level Systems, $550K. June 2004-2010. PI: Michael Hicks.

University of Maryland Partnership with the Laboratory for Telecommunications Sciences (LTS), Safe and Robust Dynamic Software Updating for Real-time Embedded Applications, $327K, August 2007–January 2010. PI: Michael Hicks, co-PI: Jeff Foster.

Army Research Lab Communications and Networking Collaborative Technology Alliance (ARL C&N CTA) program TIP-07-4, End-to-End Security of Cross-Domain Information Flows, $245K (funds to Maryland). October 2006–October 2009. PI: Michael Hicks.

ARL C&N CTA program (supported by DARPA DSO), Provably Enforcing Decentralized, Multi-level Security Policies in Distributed, Web-based Applications, $83K. March 1, 2007–September 30, 2009. PI: Michael Hicks.

NSF CCF-0524036 Collaborative Research: CT-T: Flexible, Decentralized Information-flow Control for Dynamic Environments, $280K. September 2005-2009. PI: Michael Hicks. (This is part of a multi-institutional team grant with three other PIs for a total award of $1.1M.)

DARPA #HR00110610019 Computer Science Study Group Panelist, $77K. March 2006-2007. PI: Michael Hicks.

NSF IIS-0613601 SoD-HCER: Evaluation of Complex Designs–A Comparative Study, $100K. July 2006–2008. PI: Michael Hicks (transferred from Vibha Sazawal in January 2007).