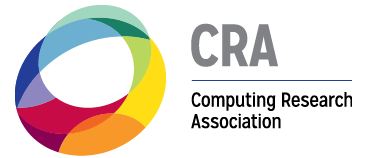


Christian Skalka

Professor and Chairperson, Computer Science
The University of Vermont



Awards and Honors and Year Received

- Best Paper Reviewer, IEEE Cybersecurity Development Conference 2017.
- DoD Young Investigator Program (YIP) Scholar, 2009-2013 (DoD analog of NSF CAREER award).
- ARCS Foundation Scholar and GRA Award, 1999-2002.
- Best Paper Award Nomination, International Conference on Parallel Problem Solving from Nature (PPSN), 2016.
- Best Paper Award, European Symposium on Programming (ESOP), 2001.

Involvement in CRA Activities

- Yes, I attended the Snowbird Conference in Summer 2018 upon assuming the role of Department Chairperson. And as Chairperson of a CRA member Department I have been responsible for CRA-related activities such as data gathering for Taulbee Survey reporting.

Other Relevant Experience

- 08/18-date Chair of Computer Science, University of Vermont (UVM)
- 09/17-date Director, UVM Center for Security and Privacy
- 09/18-date Professor of Computer Science, University of Vermont (UVM)
- 05/17-date Professor of Mathematics and Statistics (UVM, Secondary Appointment)
- 06/16-01/18 Associate Dean for Faculty Affairs (CEMS), University of Vermont (UVM)

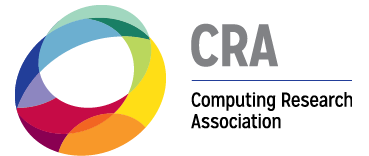
Research Interests

- Programming Languages
- Computer Security and Privacy
- Networked and Embedded Systems
- Health and Earth Science Informatics

2020 BOARD NOMINEE

Christian Skalka

Professor and Chairperson, Computer Science
The University of Vermont



Personal Statement

I am the Chairperson of Computer Science at the University of Vermont (UVM), and have also served as an Associate Dean. I am the founding member and Director of the UVM Center for Computer Security and Privacy, and as a researcher I have made numerous contributions in the areas of programming languages and security. I am UVM's primary representative to the national Building, Recruiting, and Inclusion for Diversity (BRAID) program. My background in academic and research leadership, with an emphasis on program growth and diversity at a public land-grant institution, would bring a vital perspective to the CRA Board.

CHRISTIAN SKALKA, PhD

**Professor and Chairperson, Computer Science
University of Vermont**

ceskalka@uvm.edu

<http://www.cs.uvm.edu/~ceskalka>

PROFESSIONAL PREPARATION

The Johns Hopkins University	Computer Science	Ph.D. – 2002
<i>Thesis:</i> Types for Programming Language-Based Security		
<i>Advisor:</i> Scott Smith, Computer Science		
Carnegie Mellon University	Logic, Computation, and Methodology	MS -1997
<i>Thesis:</i> Some Decision Problems for ML Refinement Types.		
<i>Advisor:</i> Frank Pfenning, Computer Science		
St. John’s College, Santa Fe	Philosophy & Mathematics	BA- 1991

APPOINTMENTS

08/18-date	Chair of Computer Science, University of Vermont (UVM)
09/18-date	Professor of Computer Science, University of Vermont (UVM)
06/16-01/18	Associate Dean for Faculty Affairs (CEMS), University of Vermont (UVM)
01/16-06/16	Acting Chair of Computer Science, University of Vermont (UVM)
05/08-09/18	Associate Professor of Computer Science, University of Vermont (UVM)
09/02-05/08	Assistant Professor of Computer Science, University of Vermont (UVM)
05/17-date	Professor of Mathematics and Statistics (UVM, Secondary Appointment)

MEMBERSHIPS

Association for Computing Machinery, member since 2003

American Alpine Club (AAC), member since 2010

MAJOR ADMINISTRATIVE EXPERIENCE

Chair of Computer Science Department (2018-date). Major personnel responsibilities include annual performance evaluations, and reappointment, promotion and tenure evaluations for all of our full-time faculty members. I am responsible for course scheduling for the Department, and management of our annual budget. I Chair our Curriculum Committee and lead the Department’s Major program development and design. I represent the Department to the external community, e.g. the CEMS Board of Advisors, upper administration at UVM, and external businesses and other entities. I manage our engagement in the national BRAID (Building, Recruiting, And Inclusion for Diversity) program. I work with other leadership in CEMS

in College-level administrative efforts and to define policies for the College. I administrate day-to-day activities in the Department and help guide us to achieve long-term goals.

Director, UVM Center for Computer Security and Privacy (CCSP). As the founding Director for the UVM CCSP, I have built our group up from conception to its current form as one of three major interdisciplinary research groups in our College. In this role I formed a CCSP Board of Advisors, whose members include major industry and state government representatives, to advise our development. I have advocated for and recruited new tenure track faculty in this area, and we are recruiting new faculty in Spring 2020 to further grow our active research group. I have developed a new corporate partnership with Threat Stack, Inc. to fund a new GRA Fellowship in cybersecurity and to develop new research and coop opportunities.

Associate Dean for Faculty Affairs for the UVM College of Engineering and Mathematical Sciences (ADFA, CEMS), (2016-2018). I served as an advocate for faculty members and as an advisor to the Dean. Major responsibilities included oversight of reappointment, promotion, and tenure for all CEMS faculty members. I also oversaw faculty sabbatical applications and led development of new sabbatical application policies for CEMS. I managed the reorganization of the former CEMS School of Engineering into multiple Departments, including development of all new faculty guidelines. I was the New England Association of Schools and Colleges (NEASC) accreditation coordinator for the CEMS, and liaison to the UVM Honors College. I advised the Dean and Faculty on various day-to-day issues related to our teaching and research mission. In my capacity as ADFA, I served on the following University-level Committees:

- UVM STEM Enrollment Trajectory Committee, advisory to the Provost.
- NEASC Standards Academic Program Committee, advisory to the President.
- Distinguished Lecturer Award Committee, advisory to the President.

RESEARCH STATEMENT

My research interests lie at the intersection of Computer Science theory and practice. I develop innovative formal methods based on programming language type theory, mathematical logic, and computability theory in general. I also build cyber-physical systems based on these technical innovations, and explore applications of these methods to important practical problems, especially related to cybersecurity, health, and the environment. My approach to research is highly collaborative, and I emphasize involvement of students in my research at both the graduate and undergraduate level, as evidenced by numerous papers co-authored with them, and by financial support provided by intra- and extramural funding. My main research thrusts are summarized as follows.

Programming languages (PLs), especially type theory for static enforcement of security properties in higher order and object oriented PLs, and semantic foundations for security properties in programs. More recently I have begun new investigations into proof methods for enforcing security properties in software-defined networking PLs. Related research efforts have been supported by grant funding from NSF, DoD (AFOSR), and VT EPSCoR.

Distributed security architectures. I have investigated logics defined to guarantee authorization in distributed systems. This includes both foundational work, and practical applications especially in low-powered embedded networks. More recently, I have begun to explore a proof carrying code framework for enforcing security in software-defined networks, with grant support from NSF. Completed work has been funded by DoD (AFOSR).

Cyber physical systems, including embedded and networked systems for data collection, and machine learning approaches to data interpretation. One major area of related research has been applications of cyber physical systems to problems in snow hydrology, specifically snowpack estimation. I have built real embedded systems in the field, and designed new algorithms for interpretation of ground and satellite data. More recently, I have applied these experiences to develop innovative systems for health sciences applications. All of my research in cyber physical systems has been highly collaborative with domain experts and has offered many opportunities for student research. This work has been funded by VT NASA/EPSCoR and intramural pilot funding for current developing work.

FUNDED RESEARCH PROJECTS

- **Project:** *UVM/Threat Stack Cybersecurity Initiative*
Investigators: Christian Skalka (Lead PI), Joseph Near (co-PI)
Funding Source: Threat Stack Corporation, with matching funds from UVM Industry Fellowship Program.
Synopsis: The goal of project is to enhance the human decision loop in security operations centers with model-based support, to more efficiently and reliably identify security threats in network services.
Award: \$100,000 (with \$60,000 match from UVM Industry Fellowship), 09/01/19-03/31/21
- **Project:** *SaTC: CORE: Small: Collaborative: A New Approach to Federated Network Security (CNS-1718083)*
Investigators: Christian Skalka (Lead PI), Nate Foster (PI, Cornell), Dexter Kozen (co-PI, Cornell), Hossein Hojjat (PI, RIT)
Funding Source: National Science Foundation CISE/CCF, Secure and Trustworthy Cyberspace (SaTC).
Synopsis: The goal of this collaborative project is to support formally well-defined security guarantees in software defined networks (SDNs) involving multiple security domains (federations). Our technical approach is to develop new proof carrying code frameworks for the NetKAT SDN programming language, and to leverage program synthesis to support network virtualization.
Award: \$500,000 (\$196,872 to UVM), 09/01/17-08/31/20
- **Project:** *Cyber-Physical System Innovations to Monitor and Improve Compliance with At-Home Neuromuscular Rehabilitation*
Investigators: Christian Skalka (co-PI) and Michael Toth (PI, UVM Larner College of Medicine)
Funding Source: University of Vermont, Biomedical Engineering Pilot Project
Synopsis: This pilot project award will support development of the RehabTracker cyber-physical system, designed to support compliance with an at-home electro-muscular

stimulation therapy regime for patients undergoing ACL reconstruction surgery. The project will culminate with a pilot 24-person clinical study.

Award: \$40,000, 09/01/17-08/31/18

- **Project:** *TWC:Medium:Collaborative:Retrofitting Software for Defense-in-Depth (CNS-1408801)*
Investigators: Christian Skalka (PI, UVM), Vinod Ganapathy (PI, Rutgers), Gang Tan (PI, PSU), Trent Jaeger (Lead PI, PSU)
Funding Source: National Science Foundation CISE/CCF, Secure and Trustworthy Cyberspace (SaTC).
Synopsis: The overall goal of this project is to develop a method that programmers can use to retrofit their programs with security controls for containment, authorization, and auditing that satisfy explicit security goals (e.g., policies to enforce) and are globally optimal relative to functional costs.
Award: \$1,200,000 (\$299,243 to UVM), 09/01/14-08/31/18
- **Project:** *An Information Systems Approach to Determine the Optimal Timing of Early Intervention to Prevent Post-Trauma Mental Illness*
Investigators: Christian Skalka (co-PI) Matthew Price (PI, UVM Psychological Sciences), Kaley Freeman (co-PI, UVM Larner College of Medicine).
Funding Source: UVM REACH
Synopsis: This pilot project award funded a clinical trial of a mobile app-based system, called Alliance, intended to aid in the recovery from post-traumatic stress. The system reports self-assessment and biometric data to care providers to improve interventions.
Award: \$35,000, 5/1/15-4/30/16
- **Project:** *Inductive Modeling of Macro-Scale SWE Using Satellite Telemetry*
Investigators: Christian Skalka (PI) and Josh Bongard (co-PI, UVM)
Funding Source: VT Space Grant Consortium/NASA EPSCoR GRA Program
Synopsis: GRA support for modeling distributed alpine snow depth through applications of machine learning to historical satellite data.
Award: \$23,000, 7/15/15-5/15/16
- **Project:** *The Vermont Frozen Landscapes Monitoring Project*
Investigators: Christian Skalka (PI), Jeff Frolik (PI, UVM Electrical and Biomedical Engineering), Beverly Wemple (PI, UVM Geography)
Funding Source: VT Space Grant Consortium/NASA Consortium Development Competition
Synopsis: This award supported development of the SnowCloud system, a wireless sensor network for low cost, ground-based, distributed alpine snow depth estimation. The SnowCloud system has been deployed in Vermont, New Hampshire, California, and Norway.
Award: \$185,000 10/01/10-05/01/15
- **Project:** *A Language-Based Approach to Wireless Sensor Network Security (FA9550-09-1-0083)*
Investigators: Christian Skalka (PI)
Funding Agency: USAF, AFRL, Air Force Office of Scientific Research, Information and Operations Security, DoD Young Investigator Program (YIP)
Synopsis: This YIP early-career scholar award supported development of distributed security

architectures in low-powered embedded networks. A main technical feature of this project was the application of security logics, implement using elliptic curve cryptography, to support multiple security domains in cooperating networks.

Award: \$599,885, 04/01/09-12/31/13

- **Project:** *Complementing Static In Situ Sensing with Mobile Gateway Resources for Improved Environmental Monitoring*

Investigators: Christian Skalka (PI), Jeff Frolik (co-PI)

Funding Agency: VT Space Grant Consortium/NASA EPSCoR Small-Scale Project

Synopsis: This grant supported development of a low-cost, cellular-enabled data pipeline for embedded systems in harsh alpine environments.

Award: \$38,900, 09/01/10-08/31/11

- **Project:** *An Exploratory Project to Develop an In Situ Snow Water Equivalent Monitoring System with Improved Spatial Resolution*

Investigators: Christian Skalka

Funding Source: VT Space Grant Consortium/NASA EPSCoR Pilot Project

Synopsis: This pilot award supported initial development of a wireless sensor network for snowpack monitoring applications.

Award: \$25,000, 07/01/08 -- 06/30/09

- **Project:** *Trace Effect Analysis for Software Security (FA9550-06-1-0313)*

Investigators: Christian Skalka (PI)

Funding Source: USAF, AFRL, Air Force Office of Scientific Research, Information and Operations Security

Synopsis: This project was focused on developing formal foundations for expressing and enforcing temporal security properties, i.e. properties depending on the before/after *order* of program events. I developed new static analyses for guaranteeing enforcement of temporal security properties in higher order and object oriented languages, based on foundational innovations in type theory and temporal logics.

Award: \$358,185, 06/01/06-05/31/09

- **Project:** *Context-Based Security in Programming Languages*

Investigators: Christian Skalka (PI)

Funding Source: VT EPSCoR GRA Program

Synopsis: This pilot award funded initial investigations into type-based approaches to static enforcement of temporal security properties in higher order languages.

Award: \$37,500, 09/01/03-05/31/05

PEER REVIEWED CONFERENCE PUBLICATIONS

Note: in all publications listed, underlined co-authors were student advisees at the time of paper publication.

- **Christian Skalka**, John Ring, David Darais, Minseok Kwon, Sahil Gupta, Kyle Diller, Steffen Smolka, and Nate Foster. Proof Carrying Network Code. In ACM Conference on Computer and Communications Security (CCS), 2019.

- Frank Capobianco, **Christian Skalka**, and Trent Jaeger. *Tracking the Provenance of Access Control Decisions*. In International Workshop on Theory and Practice of Provenance (TaPP), 2017.
- Giuseppe Petracca, Frank Capobianco, **Christian Skalka**, and Trent Jaeger. *On Risk in Access Control Enforcement*. In ACM Symposium on Access Control Models and Technologies (SACMAT), 2017.
- Nate Foster, Hossein Hojjat, Paparao Palacharla, **Christian Skalka**, and Xi Wang. *Life on the Edge: Unraveling Policies into Configurations*. In The ACM/IEEE Symposium on Architectures for Networking and Communications Systems (ANCS), 2017.
- Sepehr Amir-Mohammadian and **Christian Skalka**. *In-Depth Enforcement of Dynamic Integrity Taint Analysis*. In *ACM Programming Languages and Security Workshop (PLAS)*, 2016.
- Sam Kriegman, Marcin Szubert, Josh Bongard, and **Christian Skalka**. *Evolving Spatially Aggregated Features From Satellite Imagery for Regional Modeling*. In International Conference on Parallel Problem Solving from Nature (PPSN), 2016.
- Sepehr Amir-Mohammadian, Stephen Chong, and **Christian Skalka**. *Correct Audit Logging: Theory and Practice*. Principles of Security and Trust (POST), 2016.
- Sepehr Amir-Mohammadian, Stephen Chong, and **Christian Skalka**. *Foundations for Auditing Assurance*. In Layered Assurance Workshop (LAW), 2015.
- Afsoon Yousefi Zowj, Joshua C Bongard, and **Christian Skalka**. *A Genetic Programming Approach to Cost-Sensitive Control in Resource Constrained Sensor Systems*. In Genetic and Evolutionary Computation Conference (GECCO), 2015.
- Vinod Ganapathy, Trent Jaeger, **Christian Skalka**, and Gang Tan. *Assurance for Defense in Depth via Retrofitting*. In Layered Assurance Workshop (LAW), 2014.
- Peter Chapin, **Christian Skalka**, Scott Smith, and Michael Watson. *Scaleness/nesT: Type Specialized Staged Programming for Sensor Networks*. In ACM Generic Programming: Concepts and Experiences (GPCE), 2013.
- **Christian Skalka** and Jeff Frolik. *Snowcloud: A Complete System for Snow Hydrology Research*. In ACM Workshop on Real-World Wireless Sensor Networks (RealWSN), 2013.
- C. David Moeser, Mark Walker, **Christian Skalka**, and Jeff Frolik. *Application of a Wireless Sensor Network for Distributed Snow Water Equivalence Estimation*. In Western Snow Conference, 2011.
- Peter Chapin and **Christian Skalka**. *SpartanRPC: WSN Middleware for Cooperating Domains*. In IEEE Conference on Mobile and Ad-Hoc Sensor Systems (MASS), 2010.
- Stephen Chong, **Christian Skalka**, and Jeffrey A. Vaughan. *Self-Identifying Sensor Data*. In ACM Information Processing in Sensor Networks (IPSN), 2010.
- Yu David Liu, **Christian Skalka**, and Scott Smith. *Type-Specialized Staged Programming with Process Separation*. In Workshop on Generic Programming (WGP09), 2009
- **Christian Skalka**, Jeff Frolik, and Beverley Wemple. *A Distributed In Situ System for Snow Water Equivalence Measurement*. In International Snow Science Workshop (ISSW), 2008.

- Paritosh Shroff, Scott Smith and **Christian Skalka**. *The Nuggetizer: Abstracting Away Higher Orderness for Program Verification*. Asian Symposium on Programming Languages and Systems (APLAS), 2007.
- **Christian Skalka**. *Type Safe Dynamic Linking for JVM Access Control*. ACM Conference on Principles and Practice Declarative Programming (PPDP), 2007: 51-62.
- **Christian Skalka** and Jeff Polakow. *A LolliMon Specification of RT*. ACM Workshop on Programming Languages and Analysis for Security (PLAS) 2006: 37-46.
- **Christian Skalka**, X. Sean Wang and Peter Chapin. *Risk Assessment in Distributed Authorization*. ACM Workshop on Formal Methods in Security Engineering (FMSE), 2005: 33-42.
- **Christian Skalka**. *Trace Effects and Object Orientation*. ACM Conference on Principles and Practice of Declarative Programming (PPDP), 2005: 139-150.
- **Christian Skalka** and X. Sean Wang. *Trust but Verify: Authorization for Web Services*. ACM Workshop on Secure Web Services (SWS), 2004: 47-55.
- **Christian Skalka** and Scott Smith. *History Effects and Verification*. Asian Programming Languages Symposium (APLAS), 2004: 107-128.
- **Christian Skalka** and Scott Smith. *Static Use-Based Object Confinement*. Workshop on Foundations of Computer Security (FCS), 2002: 117-126.
- François Pottier, **Christian Skalka**, and Scott Smith. *A Systematic Approach to Static Access Control*, European Symposium on Programming (ESOP), 2001: 30-45.
- **Christian Skalka** and Scott Smith. *Static Enforcement of Security with Types*. ACM International Conference on Functional Programming (ICFP), 2000: 35-45.

PEER REVIEWED JOURNAL PUBLICATIONS AND BOOK CHAPTERS

- **Christian Skalka**, Sepehr Amir-Mohammadian, and Samuel Clark. *Maybe Tainted Data: Theory and a Case Study*. Journal of Computer Security, 2019. Accepted for publication pending minor revisions.
- Safwan Wshah, **Christian Skalka**, and Matthew Price. *Predicting Risk of Posttraumatic Stress Disorder Symptomology Using Machine Learning*. JMIR Mental Health, 6(7), 2019.
- M. Price, K. van Stolk-Cooke, A. C. Legrand, Z. M. F. Brier, H. L. Ward, J. P. Connor, J. Gratton, K. Freeman, and **Christian Skalka**. *Implementing Assessments via Mobile Apps During the Acute Posttrauma Period: Feasibility, Acceptability, and Strategies to Improve Response Rates*. European Journal of Psychotraumatology, 2018
- M. Price, K. van Stolk-Cooke, H. L. Ward., M. O’Keefe, J. Gratton, **C. Skalka**, and K. Freeman. *Tracking Post-Trauma Psychopathology Using Mobile Applications: A Usability Study*. Journal of Technology in Behavioral Science, 2017:1-8, doi:10.1007/s41347-016-0008-9.

- Afsoon Yousefi, **Christian Skalka**, and Josh Bongard. A Genetic Programming Approach to Cost-Sensitive Control in Wireless Sensor Networks. In Computational Intelligence in Wireless Sensor Networks: Recent Advances and Future Challenges, pages 1-31. Springer, 2016.
- Matthew Price, Tyler J. Sawyer, Madison Harris, and Christian Skalka. Usability Evaluation of a Mobile Monitoring System to Assess Symptoms After a Traumatic Injury: A Mixed Method Study. Eysenbach G, ed. JMIR Mental Health. 2016;3(1):e3. doi:10.2196/mental.5023.
- David Buckingham, **Christian Skalka**, and Joshua Bongard. *Inductive Learning of Snowpack Distribution Models for Improved Estimation of Areal Snow Water Equivalent*. Journal of Hydrology, 524:311-325, 2015.
- Stephen Chong, **Christian Skalka**, and Jeffrey A. Vaughan. *Self-Identifying Data for Fair Use*. ACM Journal of Data and Information Quality, 5(3):Article 11, 2014.
- Peter Chapin and **Christian Skalka**. *SpartanRPC: Remote Procedure Call Authorization in Wireless Sensor Networks*. ACM Transactions on Information and System Security 17(2):1-30, 2014.
- Yu David Liu, **Christian Skalka**, and Scott Smith. *Type-Specialized Staged Programming with Process Separation*. Journal of Higher Order and Symbolic Computation 24(4):341-385, 2012.
- Peter Chapin, **Christian Skalka**, and X. Sean Wang. *Authorization in Trust Management: Features and Foundations*. ACM Computing Surveys 40(3): 1-48, 2008.
- **Christian Skalka**. *Types and Trace Effects for Object Orientation*. Journal of Higher Order and Symbolic Computation 21(3): 239-282, 2008.
- **Christian Skalka**, Scott Smith, and David Van Horn. *Types and Trace Effects of Higher-Order Programs*. Journal of Functional Programming 18(2): 179-249, 2008.
- **Christian Skalka**, X. Sean Wang and Peter Chapin. *Risk Management for Distributed Authorization*. Journal of Computer Security 15(4): 447-489, 2007.
- **Christian Skalka**, X. Sean Wang. *Trust but Verify: Authorization for Web Services*. Journal of Computer Systems Science and Engineering 21(5): 381-392, 2006.
- **Christian Skalka** and Scott Smith and David Van Horn. *A Type and Effect System for Flexible Abstract Interpretation of Java*. Electronic Notes in Theoretical Computer Science 131: 111-124, 2005.
- François Pottier, **Christian Skalka**, and Scott Smith. *A Systematic Approach to Static Access Control*. ACM Transactions on Programming Languages and Systems, 27(2): 344-382, 2005.
- **Christian Skalka** and Scott Smith. *Static Use-Based Object Confinement*. Springer International Journal of Information Security, 4(1-2): 87-104, 2005.
- **Christian Skalka** and Scott Smith. *Set Types and Applications*. Electronic Notes in Theoretical Computer Science 75:75-94, 2003.
- **Christian Skalka** and François Pottier. *Syntactic Type Soundness for HM(X)*. Electronic Notes in Theoretical Computer Science 75: 61-74, 2003.

PATENTS

- *A distributive, non-destructive real-time approach to snowpack monitoring*, w/ J. Frolik, University of Vermont, US Patent No. 8,552,396 (Issued: October 8, 2013).

INVITED PRESENTATIONS

- *Defense in Depth: A Synthesis of Prospective and Retrospective Security*. University of Maryland Cybersecurity Group Seminar Series, September 2016.
- *A Principled Approach to Practical Embedded Device Programming*. Cornell University Computer Science Seminar Series, November 2015.
- *Alliance: Cyber Supported Therapy for Post-Trauma Recovery*. Dartmouth Technology and Behavioral Health Center Seminar Series, April 2015.
- *A Principled Approach to Practical Embedded Device Programming*. Northeastern University Computer Science Seminar Series, May 2013.
- *Self-Identifying Sensor Data*. Symposium on Data Provenance in Software, Schloss Dagstuhl, February 2012.
- *Reflections on the Lambda Cube*. Lawrence Livermore National Laboratory Networking Group, March 2011.
- *Data Provenance in Remote Environmental Monitoring*. Symposium on Data Provenance in Software, University of Edinburgh, April 2009.
- *Type Safe Dynamic Linking for JVM Access Control*. Harvard University Computer Science Seminar Series, June 2007.
- *Type Safe Dynamic Linking for JVM Access Control*. McGill University Computation and Logic Seminar Series, June 2007.
- *Logic and Practice of Trust Management*. Dartmouth University Computer Science Colloquium, January 2006.
- *Trace Effects and Object Orientation*. Tufts University Computer Science Seminar Series, October 2005.
- *Types for Access Control: Foundations and Methodology*. Church Project Seminar, Boston University, January 2003.
- *A Systematic Approach to Static Access Control*. Carnegie Mellon University Principles of Programming Seminar, March 2001.
- *Verifying Security Protocols with Specification Diagrams*. NSA Lucite seminar, George Mason University, April 1999.

OTHER MEDIA CONTRIBUTIONS

- UVM Today, “Apps: There’s a Class for That”.
<http://www.uvm.edu/~uvmpr/?Page=news&storyID=21710&category=ucommfeature>, November 2011.

- SKI Magazine, “iCrutch?”, a column about my research on avalanche assessment apps for smartphones. October 2013.
- Burlington Free Press, “UVM Research Helps Warn of Avalanches”, https://www.uvm.edu/~epscor/pdfFiles/news/skalka_01.pdf, March 2011.
- WCAX television news segment about my research on avalanche assessment apps for smartphones. March, 2011.
- VT Public Television Emerging Science Series, “Snow and Water with Christian Skalka”, <https://www.youtube.com/watch?v=V39gZGRzjl>, November 2010.
- Christian Skalka. *Programming Languages and Systems Security*. Article in IEEE Security and Privacy Magazine, May 2005

HONORS AND AWARDS

- Best Paper Reviewer, IEEE Cybersecurity Development Conference 2017.
- Best Paper Award Nomination, International Conference on Parallel Problem Solving from Nature (PPSN), 2016.
- DoD Young Investigator Program (YIP) Scholar, 2009-2013 (DoD analog of NSF CAREER award).
- Best Paper Award, European Symposium on Programming (ESOP), 2001.
- ARCS Foundation Scholar and GRA Award, 1999-2002.

EXTERNAL SERVICE

I have engaged in a variety of service activities for the broader scientific community, including service on conference Program Committees, as a peer reviewer for numerous publication venues, as a grant reviewer for several federal funding sources, and as a mentor to junior faculty at other institutions.

Program Committees: I have served on numerous conference and workshop Program Committees, including the following:

- IEEE Cybersecurity Development Conference 2017-19.
- Theory and Practice of Provenance (TaPP, USENIX workshop) 2017.
- European Conference on Object Oriented Programming (ECOOP) 2016.
- IEEE Pervasive Computing Works-in-Progress (PerCom WIP) 2015.
- ACM Generic Programming Concepts and Experience (GPCE) 2014.
- ACM Symposium on Information, Computer and Communications Security (ASSIACS) 2014 and 2014.
- International Workshop on Trends in Functional Programming in Education (TFPIE) 2014.
- New England Programming Languages Seminar (NEPLS), Program Chair 2005.
- New England Programming Languages Seminar (NEPLS), Program Committees 2004.

Conference/Journal Peer Review: I have served as a peer reviewer for numerous conferences, journals, and books, including the following:

- SpringerPlus. Computational Intelligence in Wireless Sensor Networks (Book, Springer).
- Journal of Functional Programming (JFP).
- Journal of Higher Order and Symbolic Programming (HOSC).
- ACM Transactions on Programming Languages and Systems (TOPLAS).
- ACM Computing Surveys.
- ACM Principles of Programming Languages (POPL). ACM International
- Conference on Functional Programming (ICFP).
- ACM Conference on Computer Science Logic (CSL).
- ACM Workshop on Types in Language Design and Implementation (TLDI).
- IEEE Symposium on Security and Privacy.
- IEEE Symposium on Logic in Computer Science (LICS).
- European Symposium on Programming (ESOP).
- Foundations of Software Science and Computation Structures (FOSSACS).
- Asian Programming Languages Symposium (APLAS).
- IFIP TC-11 WG 11.1 & WG 11.5

Grant Proposal Peer Review: I have served as a panelist for several agencies:

- National Science Foundation. Multiple panels beginning 2004, most recent panel service October 2019.
- USAF, AFRL, Air Force Office of Scientific Research. Multiple reviews, most recently 2015.
- Dutch National Science Foundation (NWO) Cybersecurity Research Program, 2013.

Other Activities:

- External Mentor (for Dr. Hossein Hojjat), Rochester Institute of Technology, 2016-present.
- IFIP WG 2.4 Working Group on Software Implementation Technology, October 2017.
- IFIP TC-11 WG 11.1 & WG 11.5 Joint Working Groups on Security Management, Integrity, and Internal Control in Information Systems, December 2005.

INTERNAL FACULTY SERVICE

In addition to administrative service as described above, I have served in the following UVM faculty service roles.

- UVM Center for Computer Security and Privacy, Director, July 2017-present.
- CS Tenure Track Search Committee Chair, September 2016-present.
- CS/Complex Systems Tenure Track Cluster Hire Search Committee member, 2016/17.
- CS Tenure Track Search Committee member, 2015/16.
- College of Engineering and Mathematical Sciences Curriculum Committee, Spring 2016
- College of Engineering and Mathematical Sciences Honors College Representative, 2014-2016.
- College of Engineering and Mathematical Sciences Faculty Council, 2012-2016.
- College of Engineering and Mathematical Sciences Facilities Committee, Chair 2011-2015.

- Department of Computer Science Chair Search Committee, Spring 2012.
- Computer Science Faculty Senate Representative, 2011-2012.
- Computer Science Department Curriculum Committee, 2002-present.
- Computer Science Department Graduate Committee, 2005-present.

GRADUATE AND POSTDOCTORAL ADVISING

I have advised several graduate students at both the MS and PhD levels, always in a research capacity and coauthoring published work with all PhD students and the majority of MSs.

PhD Thesis Advisees:

- John Ring, current, matriculated Fall 2018.
- Sepehr Amir-Mohammadian, matriculated Winter 2013, expected graduation Fall 2017.
Thesis topic: A Formal Approach to Combining Prospective and Retrospective Security.
- Peter Chapin, graduated Spring 2014.
Thesis topic: Trust Management in Distributed Resource Constrained Systems.
- Diana Tatar, matriculated Fall 2007 (did not graduate).

MS Thesis/Project Advisees:

- Samuel Clark, matriculated Fall 2019.
- Duncan Enzman, matriculated Fall 2019.
- Benjamin Wiggins, matriculated Fall 2017.
- Timothy Stevens, matriculated Fall 2017.
- Chia Chun Chao, graduated Fall 2018.
Project Topic: Cyber-physical systems support for ACL rehabilitation compliance.
- Nisha Chaube, graduated Spring 2018.
Project Topic: Machine learning for PTSD modeling prediction.
- Christopher Fusting, graduated Fall 2017.
Thesis topic: Predictive modeling of arctic browning.
- Samuel Kriegman, graduated Summer 2016.
Thesis topic: Modeling of alpine snow water equivalent using machine learning.
- Afsoon Yousefi, graduated Winter 2015.
Thesis topic: Genetic programming and multi-objective optimization for multi-modal sensor fusion.
- David Buckingham, graduated Fall 2014.
Thesis topic: Evolutionary algorithms for adaptive sampling.
- Michael Watson, graduated Spring 2014.
Thesis topic: Type systems for staged programming architectures.
- Christopher Morse, matriculated Winter 2013 (did not graduate).

- Samuel Ogden, matriculated Winter 2011 (did not graduate).
- C. David Moeser, graduated University of Nevada, Reno, Spring 2010.
Thesis topic: Mesoscale areal snow depth estimation using Snowcloud data.
- Simone Willett (MS Project), graduated Spring 2010.
Project topic: Elliptic cryptography certificate generation and validation.
- Sarah Greenberg (MS), matriculated Winter 2009 (did not graduate).
- Charley Robinson (MS), graduated Spring 2009.
Thesis topic: Design and Deployment of the SnowCloud snowpack monitoring system.
- Bridget Zurn (MS), graduated Spring 2006.
Thesis topic: Semantic foundations for a reactive domain specific language.
- David Van Horn (MS), graduated Spring 2005.
Thesis topic: Algorithmic Trace Effect Analysis.

Postdoctoral Advisees:

- Dr. Evgeny Makarov, 2008-2009.

UNDERGRADUATE RESEARCH ADVISING

I involve many undergraduates in research, as formally evidenced by Honors Theses, and recent CEMS Research Experience for Undergraduates (REU) students I've advised. The latter receive a financial grant from CEMS to support faculty-advised research activities.

Honors Theses:

- Lindsey Stuntz, 2018/19.
- John Ring, 2015/16.
- Rebecca Norton, 2013/14

CEMS REUs:

- Lindsey Stuntz, 2018
- Brian Waters, 2016
- Tim Stevens, 2017
- Ramy Koudsi, 2017
- Lindsey Stuntz, 2017
- Adam Barson, 2017

COURSE INSTRUCTION AND DEVELOPMENT

New Courses: Development of innovative new coursework has been a main contribution of my teaching efforts. This includes the following 3-credit courses:

- *CS295 Foundations of Computer Security*. This was an entirely new course design, covering topics in the formal foundations of computer security including properties and hyperproperties such as access control, liveness, and noninterference.
- *CS275 Mobile Apps and Embedded Devices*. This projects-based course explores systems incorporating mobile and embedded (e.g. IoT) applications.
- *CS225 Programming Languages*. This course used an existing text, but I proposed and gained approval for this upper level course in PLs and developed the entire syllabus.
- *CS125 Introduction to Computability and Complexity*. This course is standard material and used an existing text, but I proposed and gained approval for this Sophomore-level course that was previously not offered by UVM CS.
- *CS123 Programming Languages*. I revamped this existing UVM CS course in its entirety with an original set of notes and syllabus.
- *CS303 Types in Programming Languages*. I developed the syllabus for this special topics course in PLs, based on an existing text.
- *CS361 Wireless Sensor Network Applications*. I developed the syllabus and all course material for this new course on Wireless Sensor Networks.
- *CS095 Introduction to Computer Science with Wireless Devices*. I developed the syllabus and all course material for this introductory special topics course in Computer Science.
- *HCOL196 The Killer App: Computers and Society*. I developed the syllabus and all course material for this UVM Honors College Sophomore Seminar.