

Abridged Vita: Eugene H. Spafford



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PROFESSIONAL EXPERIENCE

- 1/86–8/87** **Research Scientist II**, Software Engineering Research Center, Georgia Institute of Technology.
- 8/87–6/93** **Assistant Professor** of Computer Sciences, Purdue University.
- 8/92–5/98** **Laboratory Director**, COAST Project and Laboratory, Purdue University.
- 7/93–8/97** **Associate Professor** of Computer Sciences, Purdue University.
- 8/97–present** **Professor** of Computer Sciences, Purdue University.
- 5/98–10/03** **Director**, Center for Education and Research in Information Assurance and Security (CERIAS), Purdue University.
- 12/98–12/01** **Chief Information Systems Security Officer**, Purdue University.
- 6/00–present** **Head**, multidisciplinary Information Security graduate program, Purdue University
- 5/00–present** **Professor of Philosophy (courtesy appointment)**, Purdue University.
- 1/03–present** **Professor of Communication (courtesy appointment)**, Purdue University.
- 9/03–6/04** **Senior Advisor to the Office of the Assistant Director**, CISE, National Science Foundation.
- 10/03–6/16** **Executive Director**, CERIAS, Purdue University.
- 10/03–present** **Professor of Electrical and Computer Engineering (courtesy appointment; joint appointment 2004–2007)**, Purdue University.
- 01/07–05/10** **Adjunct Professor of Computer Science and Executive Director**, Institute for Information Assurance Board of Advisors, the University of Texas at San Antonio.
- 02/13–present** **Professor of Political Science (courtesy appointment)**, Purdue University.
- 06/16–present** **Executive Director Emeritus**, CERIAS, Purdue University.
- 08/18–07/19** **Visiting Senior Scientist**, National Security Agency.
- 08/18–07/19** **Visiting Fellow**, Sandia National Laboratories.

EDUCATION

- 5/79** **B.A. in Mathematics and Computer Science (summa cum laude),**
State University College at Brockport (SUNY)
- 9/81** **M.S. in Information and Computer Science,**
Georgia Institute of Technology
Thesis title: *A Mixed-strategy Page Replacement Algorithm for a Multiprogramming Virtual Memory Computer*
Advisor: Philip H. Enslow, Jr.
- 6/86** **Ph.D. in Information and Computer Science,**
Georgia Institute of Technology
Thesis title: *Kernel Structures for a Distributed Operating System*
Advisors: Martin S. McKendry and Partha Dasgupta
Academic minor: Operations Research

RESEARCH INTERESTS

Computer-related failures may be the results of accident, or they may be caused by software faults present in software that was poorly designed and inadequately tested. Moreover, failures can occur because of malicious activity by vandals and criminals, either as intruders trying to obtain information, or through the application of *vandalware* such as worms and viruses.

My research has been focused on the prevention, detection, and remediation of information system failures and misuse, with an emphasis on applied information security. This has included research in fault tolerance, software testing and debugging, intrusion detection, software forensics, and security policies. I have also been involved in issues of science and national security policy.

MEMBERSHIPS

- American Association for the Advancement of Science (AAAS)
 - AAAS Fellow as of 1999
- Association for Computing Machinery (ACM) Life Member
 - ACM Fellow as of 1997
- Institute of Electrical and Electronics Engineers (IEEE)
 - Computer Society
 - Society on Social Implications of Technology
 - IEEE Fellow as of 2001
- Sigma Xi, Life Member

- Information Systems Security Association (ISSA) Life Member
 - Distinguished ISSA Fellow as of 2009
- Upsilon Pi Epsilon, Life Member

HONORS, AWARDS & RECOGNITIONS

- 1990** Top 10 Undergraduate Teachers in Purdue School of Science.
- 1991** Elevated to Senior Member grade in IEEE.
- 1992** Inducted in Sigma Xi.
 Inducted in Upsilon Pi Epsilon, the Computer Sciences honor society.
 Top 10 Undergraduate Teachers in Purdue School of Science.
 IEEE Computer Society's Meritorious Service Certificate, "...for participating in the 1991 Curriculum Task Force."
- 1995** Named to State University of New York (SUNY) Alumni Statewide Honor Roll.
 Named as a Cecil H. and Ida Green Honors Professor at Texas Christian University, Fort Worth, TX.
- 1996** Awarded charter Membership in the IEEE Computer Society's *Golden Core* for distinguished service to the Computer Society during its first 50 years.
Award of Distinguished Technical Communication (highest award) and *Award of Merit* by the Society for Technical Communication for Practical Unix and Internet Security.
- 1997** Inducted as a *Fellow of the ACM*.
- 1999** Inducted as a *Fellow of the AAAS*.
 Named as one of the "5 Most Influential Leaders in Information Security" by the readers of Information Security.
- 2000** Finalist for Indiana Information Technology Association (INITA) Cyberstar Award for Outstanding Contribution to Technology Education.
 NIST/NCSC *National Computer Systems Security Award*.
 Proclaimed an Honorary CISSP by (ISC)²
 Inducted as a *Fellow of the IEEE*.
 Named Applied Computer Security Associates Distinguished Practitioner.
 Named by the Washington Post as one of the most influential policy experts in information security in the US.
- 2001** Purdue University *Outstanding Undergraduate Teaching Award in Memory of Charles B. Murphy* (top university award for teaching).
Founder's Award of the National Colloquium for Information Systems Security Education.
 Named to the ISSA (Information Systems Security Association) *Hall of Fame*.
 Named a *Fellow of Purdue University's Teaching Academy*.
- 2003** Recipient of SUNY Brockport Alumni Association *Hall of Heritage Award*.
 Named to Purdue University's *Book of Great Teachers*.

- Awarded U.S. Air Force medal for *Meritorious Civilian Service*.
- 2004** Awarded the IEEE Computer Society's *Taylor L. Booth Medal*.
ACM SIGCAS *Making a Difference Award*.
- 2005** Honorary D.Sc. degree from SUNY, awarded at the College at Brockport.
- 2006** IEEE Computer Society Technical Achievement Award.
Joseph J. Wasserman Award of the ISACA New York Metropolitan Chapter
Selected as an ACM Distinguished Lecturer
ACM SIGSAC Outstanding Contribution Award
Named as one of Network World's *50 Most Powerful People in Networking*.
- 2007** ACM President's Award
- 2008** Fellow of the (ISC)².
Information Security's *Security 7 Award*.
- 2009** UPE *ABACUS Award*.
- 2009** CRA Distinguished Service Award.
- 2009** Named as a *Distinguished Fellow of the ISSA*
- 2010** Named as a *2010 Security Visionary* by "The Everything Channel"
- 2011** Awarded *SANS Lifetime Achievement Award*
- 2011** Award in Recognition of Leadership and Outstanding Research Contributions to the Field of Information Security, by WORLDCOMP
- 2012** Purdue University *Morrill Award* for research, teaching and service
- 2013** Named to the *Cyber Security Hall of Fame*
- 2013** Recipient of the (ISC)² *Harold F. Tipton Lifetime Achievement Award*
- 2014** Named to *Top 10 Infosec Career Influencers*, by Information Security Media Group
- 2014** Named as a *Fellow of the Ponemon Institute*
- 2015** Best paper at 2015 Annual Computer Security Applications Conference (*ACSAC*)
- 2016** Quora *Top Writer*
- 2016** *Outstanding Research Award*, ITERA
- 2016** *Sagamore of the Wabash*, award from Indiana Governor
- 2017** Quora *Top Writer*
- 2017** *Kristian Beckman Award*, IFIP Technical Committee TC 11
- 2018** Quora *Top Writer*
- 2018** *ISE Luminary Leadership Award Winner*

SELECTED PUBLICATIONS

Books Authored

- Eugene H. Spafford, Kathleen A. Heaphy, and D. J. Ferbrache; *Computer Viruses: Dealing with Electronic Vandalism and Programmed Threats*; Adapso, Arlington, VA; 123 pages; 1989.

- Simson L. Garfinkel and Gene Spafford; *Practical UNIX Security*; O'Reilly & Associates; 512 pages; May 1991.
 - 2nd edition, renamed *Practical UNIX and Internet Security*; 1000 pages, May 1996.
 - 3rd edition, with S. Garfinkel and A. Schwartz; 954 pages, February 2003.
 - Translations exist in Chinese (Taiwan), Czech, German, Japanese, Polish, Korean, Russian, and Spanish.
- Simson L. Garfinkel with Gene Spafford; *Web Security & Commerce*; O'Reilly & Associates; 483 pages; 1997
 - 2nd edition, renamed *Web Security, Privacy & Commerce*; 756 pages; Jan 2002.
 - Translations exist in Chinese (Taiwan), Czech, German, Japanese, Polish, Korean, Russian, Spanish, and Ukrainian.

Books Edited

- K. A. Seger, W. R. VonStorch and D. J. Icove; *Computer Crime: A Crime-Fighters Handbook*; Contributing editor; O'Reilly & Associates; 1995.
 - Used as the first FBI computer crime manual at Quantico.
- Editorial advisor (associate editor) for section on operating systems and networks; A. B. Tucker, editor-in-chief; *CRC Handbook of Computer Science and Engineering*; CRC Press; Boca Raton, FL; 1996.

Major Reports

- A. B. Tucker, B. H. Barnes, R. M. Aiken, K. Barker, K. M. Bruce, J. T. Cain, S. E. Conry, G. L. Engel, R. G. Epstein, D. K. Lidtke, M. C. Mulder, J. B. Rogers, E. H. Spafford, and A. J. Turner; *Computing Curricula 1991*; IEEE Press; 160 pages; Feb 1991.
- As a member of the PITAC; *Report to the President on Revolutionizing Health Care Through Information Technology*; US Government Printing Office; May 2004.
- As a member of the PITAC; *Report to the President on Cyber Security: A Crisis of Prioritization*; US Government Printing Office; February 2005.
- As a member of the PITAC; *Report to the President on Computational Science: Ensuring America's Competitiveness*; US Government Printing Office; June 2005.
- As a member of the USAF Scientific Advisory Board; *Implications of Cyber Warfare, Vols. 1-3*; SAB-TR-07-02; ed. T. Saunders and A. Levis; US Air Force; August 2007. (Note: Volumes 1 & 2 Distribution *FOUO*; Volume 3 Classified *Secret*)
- Karthik Kannan, Jackie Rees, Eugene H. Spafford; *Unsecured Economies: Protecting Vital Information*; ed. Red Consultancy; McAfee, Inc.; January 2009.

Chapters and Monographs

- Eugene H. Spafford; The USENET, chapter 5 (pp. 385–390) in *User's Guide to Computer Networks*; Tracy LaQuey, editor; Digital Press; 1990.
- Eugene H. Spafford; The UUCP Network, chapter 6 (pp. 391–394) in *User's Guide to Computer Networks*; Tracy LaQuey, editor; Digital Press, 1990.

- Eugene H. Spafford, Kathleen A. Heaphy and D. J. Ferbrache; A Computer Virus Primer, chapter 20 (pp. 316–355) in Computers Under Attack: Intruders, Worms and Viruses; Peter J. Denning, editor; ACM Press; 1990.
- Eugene H. Spafford, Kathleen A. Heaphy and D. J. Ferbrache; What is A Computer Virus?, chapter 2 (pp. 29–42) in Rogue Programs: Viruses, Worms, and Trojan Horses; Lance Hoffman, editor; Van Nostrand Reinhold, New York; 1990.
- Eugene H. Spafford, Kathleen A. Heaphy and D. J. Ferbrache; Further Information on Computer Viruses, chapter 15 (pp. 173–179) in Rogue Programs: Viruses, Worms, and Trojan Horses; Lance Hoffman, editor; Van Nostrand Reinhold, New York; 1990.
- Eugene H. Spafford; Virus, entry in the Encyclopedia of Software Engineering; edited by John Marciniak; John Wiley & Sons; 1994.
 - Reprinted in Internet Besieged: Countering Cyberspace Scofflaws; Dorothy and Peter Denning, eds.; Addison-Wesley, 1997.
- Eugene H. Spafford, Kathleen A. Heaphy and D. J. Ferbrache; Programmed Threats, in Wprowadzenie do etyki informatycznej; edited by Andrzej Kocikowski, Terrell Ward Bynum, and Krystyna Gorniak-Kocikowska; Humaniora, Adam Mickiewicz University, Poznan, Poland; 1997.
- Eugene H. Spafford, Kathleen A. Heaphy and D. J. Ferbrache; Security, in Wprowadzenie do etyki informatycznej; edited by Andrzej Kocikowski, Terrell Ward Bynum, and Krystyna Gorniak-Kocikowska; Humaniora, Adam Mickiewicz University, Poznan, Poland; 1997.
- Gene Kim and Eugene H. Spafford; Tripwire: A Case Study in Integrity Monitoring in Internet Besieged: Countering Cyberspace Scofflaws; edited by Dorothy and Peter Denning; Addison-Wesley; 1997.
- E. Eugene Schultz and Eugene H. Spafford; Intrusion Detection: How to Utilize a Still Immature Technology; in Information Security Management (4th Edition); edited by H. Tipton and M. Krause; Auerbach/CRC; 2000.
- M. J. Atallah, K. N. Pantazopoulos, J. R. Rice, and Eugene H. Spafford; Secure Outsourcing of Scientific Computations; in Advances in Computers; Chap. 6, pp 215–272; August 2001.
- James B. D. Joshi, Walid G. Aref, Arif Ghafoor and Eugene H. Spafford; “Security and Privacy Challenges of a Digital Government”; Advances in Digital Government: Technology, Human Factors, and Policy; Eds. W. J. McIver, Jr., A. K. Elmagarmid; Kluwer Academic Publishers, 2002; pp. 121–136.
- Eugene H. Spafford; “One View of Protecting the National Information Infrastructure”; Science and Technology in a Vulnerable World; AAAS, 2002; pp. 41–50.
- Eugene H. Spafford and Annie I. Antón; The Balance Between Security and Privacy; chapter 8, pp. 152–168 in Controversies in Science and Technology, Volume II; ed. D. L. Kleinman, K. A. Cloud-Hansen, C. Matta, and J. Handelsman; Mary Ann Liebert, Inc., New York, NY; 2008.
- Bingrui Foo, Matthew W. Glause, Gaspar M. Howard, Yu-Sung Wu, Saurabh Bagchi, Eugene H. Spafford; Intrusion Response Systems: A Survey; chapter 13 in Information Assurance: Dependability and Security in Networked Systems; Morgan Kaufmann Publishers; pp 377-416; 2008.

- Eugene H. Spafford; Cyber Security: Assessing Our Vulnerabilities and Developing an Effective Defense; chapter 3 in Protecting Persons While Protecting the People; revised papers of the Second Annual Workshop on Information Privacy and National Security, ISIPS 2008; ed. Cecilia S. Gal, Paul B. Kantor, Michael E. Lesk' Springer Lecture Notes in Computer Science; Volume 5661 2009.
- Fariborz Farahmand and Eugene H. Spafford; Understanding Risk and Risk-Taking Behavior in Virtual Worlds; chapter 4 in Security in Virtual Worlds, 3D Webs, and Immersive Environments: Models for Development, Interaction, and Management, edited by Alan Rea; Information Science Reference, IGI Publishing; pp. 59–71; 2011.
- Shimon Modi and Eugene H. Spafford; Future Biometric Systems and Privacy; chapter 6 in Privacy in America: Interdisciplinary Perspectives; edited by William Aspray and Philip Doty; Scarecrow Press, Inc.; pp. 167–193; 2011.
- Mohammed Almeshekah and Eugene H. Spafford; Cyber Security Deception; chapter 2 in Cyber Deception: Building the Scientific Foundation; edited by Sushil Jajodia, V.S. Subrahmanian, Vipin Swarup, and Cliff Wang; Springer International; 2016.

Journal Articles

- Eugene H. Spafford; The Internet Worm: Crisis and Aftermath; Communications of the ACM; v. 32(6), pp. 678–687; June 1989.
 - Reprinted (and translated into Japanese) in bit (Tokyo); Kyōritsu Publishing, Co.; Tokyo, Japan; v. 21(14) pp. 1830–1842; Dec 1989.
 - Reprinted as chapter 12 (pp. 223–243) in Computers Under Attack: Intruders, Worms and Viruses; Peter J. Denning, editor; ACM Press; 1990.
 - Reprinted in Crime, Deviance and the Computer (volume in the International Library of Criminology, Criminal Justice and Penology); R. Hollinger, editor; Dartmouth Publishing Company; Hampshire, England; 1997.
- Eugene H. Spafford; Extending Mutation Testing to Find Environmental Bugs; Software Practice & Experience, v. 20(2) pp.181–189; Feb 1990.
- Hiralal Agrawal, Richard A. DeMillo and Eugene H. Spafford; An Execution Backtracking Approach to Program Debugging; IEEE Software, pp. 21–26; May 1991.
- Eugene H. Spafford; Are Computer Break-Ins Ethical?; Journal of Systems and Software; v. 17(1) pp. 41–48; Jan 1992.
 - Reprinted (pp. 125–134) in Computers, Ethics, & Social Values; D. G. Johnson and H. Nissenbaum, editors; Prentice-Hall; 1995.
 - Reprinted in The Moral Foundations of Intellectual Property; Adam D. Moore, editor; 1997.
 - Reprinted in Computers, Ethics and Society; M. David Ermann, Mary B. Williams, and Michele S. Shauf, eds.; Oxford University Press; 1997.
 - Reprinted in the Encyclopedia of Applied Ethics; Ruth Chadwick, editor; pp. 571–577; Academic Press; 1997.
 - Reprinted in Internet Besieged: Countering Cyberspace Scofflaws; Dorothy and Peter Denning, editors; pp. 73–95; Addison-Wesley, 1997.

- Reprinted in Computer Ethics: The International Library of Essays in Public and Professional Ethics; Ashgate Publishing; John Weckert, editor; 2007.
- Eugene H. Spafford; OPUS: Preventing Weak Password Choices; Computers & Security; v. 11(3) pp. 273–278; May 1992.
- Hiralal Agrawal, Richard A. DeMillo and Eugene H. Spafford; Debugging with Dynamic Slicing and Backtracking; Software Practice & Experience; v. 23(6) pp. 589–616; June 1993.
- Eugene H. Spafford and Stephen A. Weeber; Software Forensics: Tracking Code to its Authors; Computers & Security; v. 12(6) pp. 585–595; Dec. 1993.
- Eugene H. Spafford; Computer Viruses as Artificial Life; Journal of Artificial Life; v. 1(3) pp. 249–265; 1994.
 - Reprinted (pp. 249–266) in Artificial Life: An Overview; ed Chris Langton; 1995.
- Steve J. Chapin and Eugene H. Spafford; Support for Implementing Scheduling Algorithms Using MESSIAHS; Scientific Programming; volume 3, pp. 325–340; 1994.
- Ivan Krsul and Eugene H. Spafford; Authorship Analysis: Identifying the Author of a Program; Computers & Security; v. 16(3) pp. 248–259; 1997.
- Simson Garfinkel and Eugene H. Spafford; Cryptography and the Web; World Wide Web Journal; v. 2(3) pp. 113–126; Summer 1997.
- Simson Garfinkel and Eugene H. Spafford; Secure CGI/API Programming; World Wide Web Journal; v. 2(3) pp. 187–200; Summer 1997.
- Steve J. Chapin and Eugene H. Spafford; Dissemination of State Information in Distributed, Autonomous Systems; Computer Communications; v. 21(11), pp. 969–979, Oct 1998.
- Christoph Schuba, Berry Kercheval, and Eugene H. Spafford; Prototyping Experiences with Classical IP and ARP over Signaled ATM Connections; Journal of Systems and Software; #44, pp. 31–43; April 1998.
- Thomas E. Daniels and Eugene H. Spafford; Identification of Host Audit Data to Detect Attacks on Low-level IP Vulnerabilities; Journal of Computer Security; v. 7(1). pp. 3–35; 1999.
- Eugene H. Spafford and Diego Zamboni; Intrusion Detection Using Autonomous Agents; in Computer Networks (Elsevier); v. 34(4) pp. 547–570; 2000.
- James Joshi, Arif Ghafoor, Walid G. Aref and Eugene H. Spafford; Digital Government Security Infrastructure Design Challenges; in IEEE Computer; v. 34(2) pp. 66–72; 2001.
- James B. D. Joshi, Walid G. Aref, Arif Ghafoor and Eugene H. Spafford; Security Models of Web-Based Applications; in Communications of the ACM; v. 44(2) pp. 38–44; 2001.
- Florian Kerschbaum, Eugene H. Spafford, and Diego Zamboni; Embedded Sensors and Detectors for Intrusion Detection; Journal of Computer Security; v. 10(1/2) pp. 23–70; 2002.
- Jackie Rees, Shubho Bandyopadhyay, and Eugene H. Spafford; *A Policy Framework for Information Security*; in Communications of the ACM; v. 46(7); pp. 101–106; July 2003.
- Brian Carrier and Eugene H. Spafford; *Getting Physical with the Digital Investigation Process*; International Journal of Digital Evidence; v. 2(2); Fall 2003.
- Brian Carrier and Eugene H. Spafford; *Defining Digital Event Reconstruction of Digital Crime Scenes*; Journal of Forensic Sciences; v 49(6), Nov. 2004.

- Florian Buchholz and Eugene H. Spafford; *On the Role of File System Metadata in Digital Forensics*; Digital Investigation; Elsevier; v. 1(4); pp. 298–309; Dec. 2004.
- Brian Carrier and Eugene H. Spafford; *Categories of Digital Investigation Analysis Techniques Based On the Computer History Model*; in Digital Investigation; Elsevier; v. 3(S), pp. 121–130, Aug. 2006.
- Paul Williams and Eugene H. Spafford; *CuPIDS: An Exploration of Highly Focused, Coprocessor-based Information System Protection*; Computer Networks; Elsevier; v 51(5); pp. 1284-1298; April 2007.
- Yu-Sung Wu, Bingrui Foo, Yu-Chun Mao, Saurabh Bagchi, Eugene H. Spafford; *Automated Adaptive Intrusion Containment in Systems of Interacting Services*; Computer Networks; Elsevier; v 51(5); pp. 1334-1360; April 2007.
- Florian Buchholz and Eugene H. Spafford; *Run-time Label Propagation for Forensic Audit Data*; Computers & Security; Elsevier; 26(7-8); pp. 496-513; Dec 2007.
- Xuxian Jiang, Florian Buchholz, Aaron Walters, Dongyan Xu, Yi-Min Wang, Eugene H. Spafford, *Tracing Worm Break-in and Contaminations via Process Coloring: A Provenance-Preserving Approach*; IEEE Transactions on Parallel and Distributed Systems; 19(7); pp. 890-902; Jul 2008.
- Travis D. Breaux, Annie I. Antón, and Eugene H. Spafford; *A Distributed Requirements Management Framework For Legal Compliance And Accountability*; Computers & Security; Elsevier; 28(1); pp. 8-17; Jan 2009.
- Benjamin A. Kuperman and Eugene H. Spafford; *Audlib: A Configurable, High-Fidelity Application Audit Mechanism*; Software Practice & Experience; John Wiley & Sons; 40(11); pp. 989–1005; Oct. 2010.
- Fariborz Farahmand, Mikhail Atallah, and Eugene H. Spafford; *Incentive Alignment and Risk Perception: An Information Security Application*; IEEE Transactions on Engineering Management; IEEE; 60(2), pp. 238-246; May 2012.
- Kyungroul Lee, Kangbin Yim, and Eugene H. Spafford; *Reverse-safe authentication protocol for secure USB memories*; Security and Communication Networks; John Wiley & Sons; 5(8); pp. 834_845; August 2012.
- Fariborz Farahmand and Eugene H. Spafford; *Understanding Insiders: An Analysis of Risk-Taking Behavior*; Information Systems Frontiers; Springer; 15(1), March 2013; pp. 5-15.
- Fariborz Farahmand, Aman Yadav, and Eugene H. Spafford; *Risks and Uncertainties in Virtual Worlds: An Educators' Perspective*; Journal of Computing in Higher Education; Springer; August 2013, 25(2), pp 49-67.
- Mohammed Almeshekah and Eugene H. Spafford; *Using Deceptive Information in Computer Security Defenses*; International Journal of Cyber Warfare and Terrorism; IGI Global; Jul-Sep 2014; 4(3); pp. 46-58.
- Christopher N. Gutierrez, Mohammed H. Almeshekah, Eugene H. Spafford, Mikhail J. Atallah, and Jeff Avery; *Inhibiting and Detecting Offline Password Cracking Using ErsatzPasswords*; ACM Transactions on Privacy and Security (TOPS); ACM; Dec 2016; 19(3).

- Christopher N. Gutierrez, Eugene H. Spafford, Saurabh Bagchi, Thomas Yurek; *Reactive Redundancy for Data Destruction Protection (R2D2)*; v 72, pp. 184-201; *Computers & Security*; Elsevier; May 2018.
- Josiah Dykstra and Eugene H. Spafford; The Case for Disappearing Cyber Security; *Communications of the ACM*; ACM; July 2018; 61(7).

Refereed Conference Papers

- Richard A. DeMillo and Eugene H. Spafford; The MOTHRA Software Testing Environment; Proceedings of the 11th Annual Software Engineering Workshop; NASA Goddard; Dec 1986.
- C. Bullard and Eugene H. Spafford; Testing Experience with MOTHRA; Proceedings of 25th Southeast ACM Conference; pp. 242–248; Apr 1987.
- Hiralal Agrawal and Eugene H. Spafford; An Execution Backtracking Approach to Program Debugging; Proceedings of the 6th Pacific Northwest Software Quality Conference; pp. 283–300; Oct. 1988.
- B. Choi, Richard A. DeMillo, E. W. Krauser, R. J. Martin, Aditya Mathur, A. Jefferson Offutt IV, Hsin Pan and Eugene H. Spafford; The MOTHRA Tool Set; Proceedings of the 22nd Hawaii International Conference on System Science (HICSS); pp. 274–285, Vol. II; Jan 1989.
- Eugene H. Spafford; Some Musings on Ethics and Computer Break-ins (invited paper); Proceedings of the Winter 1989 Usenix Conference; Usenix Association; pp. 305–311; Feb 1989.
- Eugene H. Spafford; An Analysis of the Internet Worm; Proceedings of the European Software Engineering Conference 1989 (Lecture Notes in Computer Science #387); Springer-Verlag; pp. 446–468; Sep 1989.
 - Reprinted in Proceedings of the 3rd Annual DPMA Computer Virus Workshop; pp. 24–46; 14–15 Feb 1990.
 - Reprinted as chapter 18 in Rogue Programs: Viruses, Worms, and Trojan Horses; Lance Hoffman, editor; Van Nostrand Reinhold, New York; 1990.
 - Reprinted in Datapro Reports on Information Security; McGraw-Hill Information Services Company; pp. 101–116; Jul 1990.
- Eugene H. Spafford; Computer Viruses: A Form of Artificial Life? (invited contribution); Artificial Life II, Studies in the Sciences of Complexity, vol. XII, eds. D. Farmer, C. Langton, S. Rasmussen, and C. Taylor; Addison-Wesley; pp. 727–747; 1991.
- Mehmet Şahinoğlu and Eugene H. Spafford; A Sequential Statistical Procedure in Mutation-Based Testing; Proceedings of the 28th Reliability Spring Seminar of the Central New England Council of IEEE; pp. 127–148; Apr 1990.
- Dan Farmer and Eugene H. Spafford; The COPS Security Checker System; Proceedings of the Summer 1990 Usenix Conference; Usenix Association; pp. 165–170; Jun 1990.
- Mehmet Şahinoğlu and Eugene H. Spafford; A Bayes Sequential Statistical Procedure for Approving Software Products; Proceedings of the IFIP Conference on Approving Software Products (ASP-90); Elsevier Science; pp. 43–56; Sep 1990.

- Eugene H. Spafford; Preventing Weak Password Choices; 14th National Computer Security Conference; pp. 446–455; Oct 1991.
- Hiralal Agrawal, Richard A. DeMillo and Eugene H. Spafford; Dynamic Slicing in the Presence of Pointers, Arrays, and Records; Proceedings of the 4th ACM Symposium on Testing, Analysis, and Verification; ACM Press; pp. 60–73; Oct 1991.
- Mehmet Şahinoğlu, I. Baltacı, and Eugene H. Spafford; Monte Carlo Simulation on Software Mutation Testcase Adequacy; Proceedings of COMPSTAT '92, International Association of Statistical Computing; Springer-Verlag; pp. 47–52; Aug 1992.
- Eugene H. Spafford; Observing Reusable Password Choices; 3rd Usenix UNIX Security Symposium; Usenix Association; pp. 299–312; 14–16 Sep 1992.
- Eugene H. Spafford and Stephen A. Weeber; Software Forensics: Can We Track Code to its Authors?; 15th National Computer Security Conference; pp. 641–650; Oct 1992.
- Hsin Pan and Eugene H. Spafford; Towards Automatic Localization of Software Faults; Proceedings of the 10th Pacific Northwest Software Quality Conference; pp. 192–209; Oct 1992.
- Sandeep Kumar and Eugene H. Spafford; A Generic Virus Scanner in C++; Proceedings of the 8th Computer Security Applications Conference; IEEE Press; pp. 210–219; Dec 1992.
- Steve J. Chapin and Eugene H. Spafford; Constructing Distributed Schedulers Using the Messiahs Interface Language; Proceedings of the 27th Hawaii International Conference on Systems and Software HICSS); IEEE Press; pp. 425–434, Vol. II; 1994.
- Gene H. Kim and Eugene H. Spafford; Experiences With Tripwire: Using Integrity Checkers for Intrusion Detection; Proceedings of the SANS III: System Administration, Networking, and Security Conference; Open Systems Board, SAGE and Usenix; Usenix Association; April 1994.
- Gene H. Kim and Eugene H. Spafford; Writing, Supporting, and Evaluating Tripwire: A Publicly Available Security Tool; Proceedings of the USENIX Unix Applications Development Symposium; Usenix Association; pp. 89–107; 1994.
- Steve J. Chapin and Eugene H. Spafford; Support for Security in Distributed Systems Using MESSIAHS; Proceedings of the National Computer Security Conference; pp. 339–447; Oct. 1994.
- Sandeep Kumar and Eugene H. Spafford; A Pattern-Matching Model for Intrusion Detection; Proceedings of the National Computer Security Conference; pp. 11–21; Oct. 1994.
- Gene H. Kim and Eugene H. Spafford; The Design and Implementation of Tripwire: A File System Integrity Checker; Proceedings of the 2nd ACM Conference on Computer and Communications Security; ACM PRESS; 1994.
- Sandeep Kumar and Eugene H. Spafford; A Software Architecture to Support Misuse Intrusion Detection; Proceedings of the 18th National Information Security Conference; pp. 194–204; Oct, 1995.
 - Reprinted in DATAPRO GTAC³ Series on Security, McGraw-Hill, Delran NJ, 1996.
- Mark Crosbie and Eugene H. Spafford; Active Defense of Computer Systems Using Autonomous Agents; Proceedings of the 18th National Information Security Conference; Oct, 1995.

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- Richard A. DeMillo, Hsin Pan, and Eugene H. Spafford; Critical Slicing for Software Fault Localization; Proceedings of the International Symposium on Software Testing and Analysis (ISSTA) 96; pp. 121–134; Jan 1996.
- Mark Crosbie and Eugene H. Spafford; Evolving Event-Driven Programs; Proceedings of the First Annual Conference on Genetic Programming; pp. 273–278; July 1996.
- Taimur Aslam, Ivan Krsul and Eugene H. Spafford; A Taxonomy of Security Vulnerabilities; Proceedings of the 19th National Information Systems Security Conference; pp. 551–560; Oct 1996.
- Steve Lodin, Bryn Dole, and Eugene H. Spafford; Misplaced Trust: Kerberos 4 Random Session Keys; Proceedings of Internet Society Symposium on Network and Distributed System Security; pp. 60–70; Feb 1997.
- Christoph Schuba, Ivan Krsul, Markus G. Kuhn, Eugene H. Spafford, Aurobindo Sundaram, Diego Zamboni; Analysis of a Denial of Service Attack on TCP; Proceedings of the 1997 IEEE Symposium on Security and Privacy; pp. 208–233; May 1997.
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- Christoph Schuba and Eugene H. Spafford; A Reference Model for Firewall Technology; Proceedings of the 13th IEEE Computer Security Applications Conference; pp. 133–145; Dec 1997.
- Eugene H. Spafford and Diego Zamboni; AAFID: Autonomous Agents for Intrusion Detection; RAID'98 Workshop; September, 1998.
- Jai Sundar Balasubramaniyan, Jose Omar Garcia-Fernandez, David Isacoff, Eugene H. Spafford, and Diego Zamboni; An Architecture for Intrusion Detection using Autonomous Agents; Proceedings of the 14th IEEE Computer Security Applications Conference; pp. 13–24; Dec 1998.
- Christoph Schuba and Eugene H. Spafford; Modeling Firewalls Using Hierarchical Colored Petri Nets; NATO Symposium on Protecting Information Systems in the 21st Century; October 1999.
- Eugene H. Spafford and Diego Zamboni; New directions for the AAFID architecture; RAID'99 Workshop; September, 1999.
- Thomas E. Daniels and Eugene H. Spafford; Network Traffic Tracking Systems: Folly in the Large?; Proceedings of the New Security Paradigms Workshop 2000; Sep 2000.

- Thomas E. Daniels and Eugene H. Spafford; Subliminal Traceroute in TCP/IP; Proceedings of the National Information Systems Security Conference; Sep 2000.
- Thomas E. Daniels, Benjamin A. Kuperman and Eugene H. Spafford; Penetration Analysis of XEROX Docucenter DC 230ST: Assessing the Security of a Multi-Purpose Office Machine; Proceedings of the National Information Systems Security Conference; Sep 2000.
- Florian Kerschbaum, Eugene H. Spafford and Diego Zamboni; Using embedded sensors for detecting network attacks; Proceedings of the 1st ACM Workshop on Intrusion Detection Systems; Nov 2000.
- Eugene H. Spafford and Diego Zamboni; Design and implementation issues for embedded sensors in intrusion detection; RAID'2000 Workshop; October, 2000.
- Thomas E. Daniels and Eugene H. Spafford; A Network Audit System for Host-based Intrusion Detection (NASHID) in Linux; Proceedings of the 16th Annual Computer Security Applications Conference; Dec 2000.
- Eric Bryant, James Early, Rajeev Gopalakrishna, Gregory Roth, Eugene H. Spafford, Keith Watson, Paul Williams and Scott Yost; Poly² Paradigm: A Secure Network Service Architecture; Proceedings of the 19th Annual Computer Security Applications Conference; Dec 2003.
- Brian Carrier and Eugene H. Spafford; Digital Crime Scene Reconstruction. Proceedings of the American Academy of Forensic Sciences (AAFS) Annual Meeting, February 2004.
- Brian Carrier and Eugene H. Spafford; An Event-Based Digital Forensic Investigation Framework; Proceedings of the Digital Forensics Research Workshop; 2004.
- Rajeev Gopalakrishna, Eugene H. Spafford, and Jan Vitek; Efficient Intrusion Detection Using Automaton Inlining; Proceedings of the IEEE Symposium on Security & Privacy; Oakland, CA; pp. 18–31; May 2005.
- Saurabh Bagchi, Bingrui Foo, Yu-Sung Wu, Yu-Chun Mao and Eugene H. Spafford; ADEPTS: Adaptive Intrusion Response using Attack Graphs in an E-Commerce Environment; Proceedings of the DSN-DCC Symposium 2005; Yokohama, Japan; June 2005.
- Paul D. Williams and Eugene H. Spafford; CuPIDS Enhances StUPIDS: Exploring a Coprocessing Paradigm Shift in Information System Security; Proceedings of the IEEE Workshop on Information Assurance and Security; West Point, NY; June 2005.
- X. Jiang, D. Xu, H. J. Wang, and E. H. Spafford; Virtual Playgrounds for Worm Behavior Investigation; RAID 2005 Symposium; Seattle, WA; Sept 2005.
- Brian Carrier and Eugene H. Spafford; Automated Digital Evidence Target Definition Using Outlier Analysis and Existing Evidence; Digital Forensics Research Workshop (DRFWS); Aug. 2005.
- X. Jiang, A. Walters, F. Buchholz, D. Xu, Y. Wang, and E. H. Spafford; Provenance-Aware Tracing of Worm Break-ins and Contaminations: A Process Coloring Approach; Proceedings of the IEEE International Conference on Distributed Computing Systems (ICDCS 2006); Lisbon, Portugal, July 2006.
- Eugene H. Spafford; Some Challenges in Digital Forensics; in Research Advances in Digital Forensics – II – Proceedings of the IFIP Conference on Digital Forensics; Springer; Aug 2006.

- Yu-Sung Wu, Bingrui Foo, Gaspar Modelo-Howard, Saurabh Bagchi, and Eugene H. Spafford; *The Search for Efficiency in Automated Intrusion Response for Distributed Applications*; Proceedings of the 27th IEEE Symposium on Reliable and Distributed Systems (SRDS 2008); October 2008; Napoli, Italy.
- Fariborz Farahmand and Eugene H. Spafford; *Insider Behavior: An Analysis of Decision under Risk*; First International Workshop on Managing Insider Security Threats, International Federation for Information Processing (IFIP) International Conference on Trust Management, Jun 2009, Purdue University.
- Brent Roth and Eugene H. Spafford; *Implicit Buffer Overflow Protection Using Memory Segregation*; ARES 2012 Conference; Aug 2011; Vienna, Austria.
- Mohammed Almeshekah, Mikhail Atallah and Eugene H. Spafford; *Covert Channels Can Be Useful! --Layering Authentication Channels to Provide Covert Communication*; Proceedings of the 21st International Workshop on Security Protocols; F. Stajano and J. Anderson, eds.; 2013; Springer-Verlag; Cambridge, England.
- Mohammed Almeshekah and Eugene H. Spafford; *The Case of Using Negative (Deceiving) Information in Data Protection*; Proceedings of the 9th Conference on Cyber Warfare and Security; 2014; West Lafayette, IN.
- Mohammed Almeshekah and Eugene H. Spafford; *Planning and Integrating Deception into Computer Security Defenses*; Proceedings of the New Security Paradigms Workshop (NSPW), Sep 2014; Victoria BC.
- Mohammed Almeshekah, Mikhail Atallah and Eugene H. Spafford; *Enhancing Passwords Security using Deceptive Covert Communication*; Proceedings of IFIP SEC15; May 2015; Hamburg, Germany.
- Mohammed Almeshekah, Christopher N. Gutierrez, Mikhail Atallah and Eugene H. Spafford; *Ersatz Passwords: Ending Password Cracking and Detecting Password Leakage*; Proceedings of ACSAC 2015; Los Angeles; Dec 2015. (**Best paper award**)
- Jeffrey Avery, Eugene H. Spafford, and Mohammed Almeshekah; *Offensive Deception in Computing*; Proceedings of the 12th Conference on Cyber Warfare and Security; pp. 23-31; 2017; Dayton, OH.
- Jeffrey Avery and Eugene H. Spafford; *Ghost Patches: Fake Patches for Fake Vulnerabilities*; Proceedings of the 32nd International Conference on ICT Systems Security and Privacy Protection (IFIP SEC 2017); pp. 399-412; 2017; Rome, Italy.
- Christopher N. Gutierrez, Mohammed Almeshekah, Saurabh Bagchi, and Eugene H. Spafford; *A Hypergame Analysis for Ersatz Passwords*; Proceedings of the 33rd International Conference on ICT Systems Security and Privacy Protection (IFIP SEC 2018); pp. 47-61; 2018; Poznan, Poland.

Significant Published Correspondence

- Thomas Narten and Eugene H. Spafford; *Beyond Worms (A response to Bryan Kocher)*; Communications of the ACM, ACM Forum; v. 32(6) pp. 673–674; June 1989.
- Reprinted in Computers Under Attack: Intruders, Worms and Viruses; p. 522; 1990; Peter J. Denning, editor; ACM Press.

- Eugene H. Spafford; On Hiring Hackers; Communications of the ACM, ACM Forum; v. 33(10) p. 14; Oct 1990.
- Eugene H. Spafford; Keeping a lock on Pandora's Box (A response to Bruce Henricksen); Science News; v. 139(20) p. 315; 18 May 1991.
- Eugene H. Spafford; Response to Fred Cohen's "Contest"; The Sciences; Jan/Feb 1991.

Federal Court Amicus Curia Briefs

- 1997, brief in the case of Daniel J. Bernstein vs. U.S. Department Of Commerce et al. in the Court of Appeals for the 9th Circuit.
- 2001, brief in the case of Universal City Studios, Inc., et al. vs. Eric Corley, a/k/a Emmanuel Goldstein and 2600 Enterprises, Inc., et al. in the Court of Appeals for the 2nd Circuit.
- 2005, brief in the case of Metro-Goldwyn-Mayer Studios, Inc., et al., vs. Grokster, Ltd., et al. in the Supreme Court.
- 2013, brief in case of Oracle America, Inc vs. Google, Inc. in the Federal Circuit Court of Appeals.
- 2013, brief in the case of Authors League Fund, Inc. vs. Hathitrust, Cornell University, et al. in the Court of Appeals for the 2nd Circuit.
- 2014, brief in the case of <Under Seal> vs. Eric Holder, et al. in the Court of Appeals for the 9th Circuit.
- 2014, brief in the case of Riley vs. State of California, in the Supreme Court.
- 2016, brief in the case of Apple vs. US in the Central District Court of California.
- 2017, brief in the case of Oracle America, Inc vs. Google, Inc. in the Federal Circuit Court of Appeals.
- 2018, brief in the case of United States of America vs. Microsoft Corporation in the Supreme Court.

Educational Video

- Featured contribution to Computer Ethics in the Computer Science Curriculum, videotape #1 in the series A Starter Kit on Teaching Computer Ethics, produced by the Research Center on Computers and Society, Southern Connecticut State University, September 1992.
- Featured contribution to Teaching Computer Ethics: Strategies and Cases, videotape #3 in the series A Starter Kit on Teaching Computer Ethics, produced by the Research Center on Computers and Society, Southern Connecticut State University, September 1992.
- Featured contribution to Network Security, produced by the BBC Open University. Originally aired Sept. 9, 1996.

Other Scholarly Contributions

- Eugene H. Spafford; Is a Computer Break-in Ever Ethical?; Information Technology Quarterly; Harvard Office of Information Technology; v. IX(2) pp. 9–14; summer 1990.

- Eugene H. Spafford; The United States vs. Craig Neidorf: A Debate on Electronic Publishing, Constitutional Rights, and Hacking (commentary on Dorothy Denning's statement); Communications of the ACM; v. 31(3) pp. 36–38; Mar 1991.
- A. B. Tucker, B. H. Barnes, R. M. Aiken, K. Barker, K. Bruce, J. T. Cain, S. E. Conry, G. L. Engel, R. G. Epstein, D. K. Lidtke, M. Mulder, J. B. Rogers, E. H. Spafford, and A. J. Turner; Computing Curricula 1991; Communications of the ACM; v. 34(6) pp. 69–84; Jun 1991.
- A. Gargaro, R. Rada, J. Moore, G. S. Carson, J. De Blasi, D. Emery, C. Haynes, J. Klensin, I. Montanez, and E. H. Spafford; The Power of Standards; Communications of the ACM; v. 36(8); pp. 11-12; Aug 1993.
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- Eugene H. Spafford; UNIX and Security: The Influences of History; Information Systems Security; Auerbach Publications; v. 4(3) pp. 52–60; Fall 1995.
- Eugene H. Spafford; Hacker Challenges: Boon or Bane?; IEEE Cipher; electronic issue #12; Feb 1996.
- Eugene H. Spafford; System Intrusions and Law Enforcement; EDP Audit, Control, and Security Newsletter; volume XXIV, #2; Aug 1996.
- Eugene H. Spafford; One View of a Critical National Need: Support for Information Security Education and Research; in Briefing Before the Committee on Science Subcommittee on Technology, U.S. House of Representatives, One Hundred Fifth Congress, First Session, No. 1; U.S. Government Printing Office; pp. 29–38; 11 Feb 1997.
- E. H. Spafford; *An Illustration of why security is more than technology*; in Computer Graphics; v. 34(4); pp 22-23; Nov 2000.
- Eugene H. Spafford; *Protecting Personal Information in Academia*; in Computing Research Association News; v. 13, #3; pp. 3, 4, 12; May 2001.
- Mahesh Tripunitara and Gene Spafford; *Connectivity provisioning with security attributes*; in Software Focus; v. 2, #3; pp. 112–116; fall 2001.
- Eugene H. Spafford; *Statement on the State of Information Security*; in Briefing Before the Committee on Science, U.S. House of Representatives, One Hundred Seventh Congress; U.S. Government Printing Office; 10 October 2001.
- Eugene H. Spafford; *Spaf's Crystal Ball*, in Information Security; v 5, #11; p. 100; Nov. 2002.
- Barbara Simons and Eugene H. Spafford; *Risks of Total Surveillance*; Inside Risks in Communications of the ACM; v. 46, #3; p 120; March 2003.
- *A Failure to Learn from the Past*; invited classic paper in proceedings of ACSAC 2003; IEEE Press; Dec 2003.
- *Perceptions of Information Security Risks and Implications for Public Policy*; Fariborz Fahrmand, Eugene H. Spafford and Melissa J. Dark; 4th Annual Symposium on Financial Information Systems and Cybersecurity: A Public Policy Perspective; College Park, MD; May 2007

- Eugene H. Spafford; *Voter Assurance*; invited paper in The Bridge; v 37(2), summer 2007; pp. 28–34.
- Richard Ford and Eugene H. Spafford; *Happy Birthday, Dear Viruses*; Science; 13 July 2007; 317: 210-211.
- Eugene H. Spafford; *Industry Progress and Attitudes*; Information Security; Oct 2008.
- Eugene H. Spafford; *USACM's Policy Role*; Communications of the ACM; Feb 2009; 52(2); p. 5.
- Eugene H. Spafford; *Answering the Wrong Questions Is No Answer*; Communications of the ACM; June 2009; 52(6); p. 22-24.
- Eugene H. Spafford; *Remembrances of Things Past*; Communications of the ACM; Aug 2010; 53(8); p. 35-37.
- Eugene H. Spafford; Forward to *Information Assurance and Security Ethics in Complex Systems: Interdisciplinary Perspectives*; ed. Melissa Jane Dark; Aug 2010; IGI Global.
- Eugene H. Spafford; The Strength of Encryption; Communications of the ACM; v59 #3; p. 5; March 2016.

Patents

- U.S. Patent 6725378, Network protection for denial of service attacks
- U.S. Patent 6941463, Secure Computational Outsourcing Techniques

Significant Software Projects

- Contributing author, Georgia Tech Software Tools (SWT) 1980–1984. Package of software tools, including editor and command interpreter, to provide UNIX-like environment under the PRIMOS operating system. Many of the ideas embodied in this package were later released with Revision 19 PRIMOS.
- Sole author, Georgia Tech Sendmail Kit, 1982–1984. Widely-used package of additions and configuration tools for use with the standard BSD UNIX distribution of *sendmail*. Many of these modifications were later integrated into vendor releases, and into the IDA *sendmail* release.
- Lead author, Clouds I, 1986. An experimental, distributed multicomputer operating system with support for passive objects and fault-tolerance.
- Contributing author, Mothra I, 1986. Prototype Fortran mutation system using AT&T *dmd*-style displays.
- Lead author and maintenance, Mothra II, 1986–1991. Experimental Fortran mutation system using the X Window System and integrated software tools.
- Lead author, Purdue X Speedups, 1988–1989. Set of modifications to X Window System Release 11.3, to speed up server process 25%–80%. Most of these ideas were later integrated into the Release 11.4 server from MIT.
- Director, Computer Oracle and Password System (COPS), 1989–1990. A very widely-used security verification tool for UNIX systems.

- Director, Spyder, 1988–1993. A window-based debugging tool for use on ANSI-C programs including dynamic slicing, backtracking, and a heuristic critic system.
- Designer and director of Tripwire: A Unix File Integrity Monitor, 1992. A security tool for monitoring unauthorized modifications (e.g., by viruses) and intrusions to UNIX systems.
- Director of IDIOT, (Intrusion Detection In Our Time), 1995. A software tool for monitoring intrusive activity on UNIX systems.
- Director of AAFID & ESP, (Autonomous Agents for Intrusion Detection, Embedded Sensors for Protection), 1997-2003. Agent-based intrusion detection systems.
- Director of Poly², an enhanced architecture for secure servers, 2001–2010.
- Director of The Liarsclub, a project to investigate the use of deception in cyber security, 2013-present.

PROFESSIONAL ACTIVITIES (★ indicates current)

As Editor

- Associate Editor, *Computing Systems*, 1992–1994.
- Academic Editor, *Computers & Security*, 1998–2009.
- Associate Editor, *ACM Transactions on Computing Education*, 2009–2012.
- ★ Editor-in-Chief, *Computers & Security*, Elsevier, 2010–present.

As Editorial Board Member

- Charter Member, editorial board of *Computing Systems*, 1987–1992.
- Charter member of software engineering editorial board, *International Journal of Computer and Software Engineering*, 1990–1996.
- Editorial board member, *Virus Bulletin (England)*, 1991–1997.
- Charter member of advisory board, *Journal of Information Systems Security*, 1991–1998.
- Charter member of editorial board, *VNR: Virus News and Reviews*, 1992–1993.
- Charter member of editorial board, *Journal of Artificial Life*, 1993–2002.
- ★ Charter member of the editorial advisory board, *Network Security*, 1994–present.
- Charter member of advisory board, *Network Security Observations*, 1994–1996.
- ★ Member of editorial board, *Computers & Security*, 1995–present.
- Member of editorial board, *ACM Transactions on Information and System Security*, 1999–2004.
- Member of editorial taskforce for *IEEE CS Security*, 2002.
- ★ Charter member of the editorial board, *International Journal of Information and Computer Security*, 2004–present.
- ★ Charter member of the editorial board, *International Journal on Critical Infrastructure Protection (Elsevier)*, 2007–present.

- Member of editorial board of ACM Journal on Educational Resources in Computing (JERIC)/Transactions on Computing Education, 2007–2010.

Guest editor

- Special issue of Computing Systems, v. 3(1), Winter, 1990, Experiences with Distributed and Multiprocessor Systems.
- Special issue of Computing Systems, v. 4(3), Fall, 1991, Experiences with Distributed and Multiprocessor Systems II.

Advisory/Supervisory Boards

- Member, Advisory Board for the National Bulletin Board Project at the University of Wisconsin, Madison (1988–1991).
- Member, Reference Group of the European Dependability Development Support Initiative (2001–2002).
- Member, National Advisory Board of the Research Center on Computing and Society, 1989–2000.
- Member, CERT (Computer Emergency Response Team) Advisory Board, 1994.
- Member, Software Engineering Institute (SEI) Trustworthy Systems Program Advisory Board, 1995–1996.
- Member, Department of Defense Open Networks Security Working Group (ONSWG), 1995–1996.
- Member, IBM Emergency Response Service Board of Technical Advisors, 1996–1998.
- Member, Sun User Group Board of Directors, 1996–1997.
- Member, Executive Board of 1997 National Colloquium for InfoSec Education.
- Member, Information Security Science and Technology Study Group of the InfoSec Research Council. 1997–1998.
- Member, CIC ICAMP Study Advisory Board, 1997–2000.
- Member, Board of Directors of the Computing Research Association (CRA), 1998–2007.
- Member, Advisory Board to NSF CISE, 1998–2000.
- Member, U.S. Air Force Scientific Advisory Board, 1999–2003.
- USSPACECOMM Independent Science Advisory Group, 1999–2002.
- Augmentee to President's Committee of Advisors on Science and Technology (PCAST) for the Institute for Information Infrastructure Protection (I³P), 2000.
- ACM Advisory Committee on Security and Privacy, 2001–2003.
- Member, Board of Advisors for the FBI Regional Cybercrime Forensic Laboratory Program, 2003–2005.
- U.S. GAO (General Accountability Office) Executive Council on Information Management and Technology, 2003–2017.
- Member, Microsoft's Trustworthy Computing Academic Advisory Board, 2003–2005.
- Member, President's Information Technology Advisory Committee (PITAC), 2003–2005.

- Computer Incident Factor Analysis and Categorization Project Advisory Board, 2003–2006.
- Member, National Advisory Board of The Privacy Place, NCSU/GaTech, 2004–2009.
- NSA IAD Advisory Group for the Global Information Grid, 2004–2005.
- Member of the NRC Panel on Survivability and Lethality Analysis, for the Army Research Laboratory Technical Assessment Board, ARLTAB), 2005.
- NSF CISE Assistant Director Screening Committee, 2006.
- Los Alamos National Laboratories CCN Division Review Committee, 2006–2010.
- Member, ACM Education Council, 2006–2017.
- Member, External IT Research Review Panel for MITRE Board of Directors, 2006.
- Advisor/consultant to Air Force Scientific Advisory Board; *Implications of Cyber Warfare*; 2007.
- Advisor/consultant to Air Force Scientific Advisory Board; *Defending and Operating in a Contested Cyber Domain*; 2008.
- US Air Force Cyber Advisory Council, 2008.
- US Air Force University Board of Visitors, 2009-2013.
- ★ AAAS Consortium of Affiliates for Security Policy (CASP) member, representing CRA, 2010–present.
- ★ US Naval Academy Center for Cyber Security Studies Advisory Board, 2011–present.
- NBISE Operational Testing Panel, 2012.
- Member, EPIC Advisory Board, 2013-2014.
- Sandia National Laboratories, Cyber Security Research Thrust External Advisory Board, 2012-2017.
- Member, Purdue Global Council, 2012-2013.
- ★ Member, ACM US Public Policy Council Executive Committee, 1998-present.
- ★ Member, ACM Council, 2012-2020.
- Member, EPIC Advisory Board, 2013–2014.
- ★ Member, Advisory Board for Verified Voting, 2014–present.
- Member, Board of Directors of the Network Time Foundation, 2015-2017.
- Member, Board of Directors of Sightline, Inc. 2018–present.

Committee Chair

- ACM Self-Assessment Committee, 1990–1996.
- ACM Awards Committee for the International Science and Engineering Fair, 1992–1994.
- IFIP Technical Committee 11's Working Group 4, Network Security, 1993–1996.
- ★ ACM US Public Policy Committee, 1998–2014. 2015-2016.
- ACM Advisory Committee on Security and Privacy, 2001–2003.
- NRC/CSTB Committee on Depicting IT in Innovation, 2009–2010.
- ★ ACM Committee on Ethics and Plagiarism, 2017-present.

Committee/taskforce member

- ACM/IEEE-CS Joint Taskforce on Undergraduate Curricula, 1988–1991.
- ACM Educational Activities Board, 1990–1991.
- ACM Awards Committee for the International Science and Engineering Fair, 1990–1993.
- FIRST (Forum of Incident Response and Security Teams) Steering Committee, 1992–1994.
- ACM SIG Technical Standards Committee charter member, 1992–1996.
- ACM Awards Committee, 1992–1994.
- ★ IFIP Technical Committee 11 for Security Protection in Information Processing Systems, 1993–present.
- IFIP Technical Committee 11's Working Group 8, Information Security Education and Training, 1993–1997.
- ★ ACM U.S. Public Policy Committee (USACM), 1996–present.
- Infosec Research Council Hard Problems List Committee, 2003–2004.
- IFIP Technical Committee 11's Working Group 9, Digital Forensics, 2006–2012.
- ★ Research Associate of the Software Engineering Ethics Research Institute (SEERI), 2006–present.
- ★ Computing Research Association Governmental Affairs Committee, 2005–present.
- Member, AAAS Electorate Nominating Committee: Section Information, Computing and Communications, 2012–2014.
- Member, Advisory Board of Norwegian Research School of Computer and Information Security (COINS), 2012–2017.
- ★ ACM Publications Board, 2017—present.
- ★ ACM Committee on Professional Ethics taskforce on Ethics 2018.

Conference chair

- Program Chair and General Co-chair, Usenix Workshop on Experiences Building Distributed and Multiprocessor Systems; (Ft. Lauderdale, FL, 5–6 Oct 1989). Cosponsored by Purdue/Florida SERC, in association with ACM SIGOPS, SIGCOMM and SIGSOFT, and with IEEE-CS TCDS, TCSE and TCOS.
- Program Chair and General Co-chair, Usenix Symposium on Experiences with Building Distributed and Multiprocessor Systems (SEDMS II); (Atlanta, GA, 21–22 Mar 1991). Cosponsored by Purdue/Florida SERC, in association with ACM SIGOPS, SIGCOMM And SIGSOFT, and with IEEE-CS TCDS, TCSE and TCOS.
- Program Chair and General Co-chair, Usenix Symposium on Experiences with Building Distributed and Multiprocessor Systems (SEDMS III); (Newport Beach, CA, 26–27 Mar 1992). Cosponsored by Purdue/Florida SERC, in association with ACM SIGOPS, SIGCOMM And SIGSOFT, and with IEEE-CS TCDS, TCSE and TCOS.
- Tutorial Chair and Program Co-chair, 5th FIRST Workshop on Computer Security Incident Response, St Louis, IL (Aug 1993).
- Student Paper Competition Chair, 3rd ACM/IEEE Conference on Computers, Freedom and Privacy, Chicago, IL (Mar 1994).

- Program Chair, IEEE Workshop on Security in Large-Scale Distributed Systems, conjoined with IEEE Symposium on Reliable Distributed Systems, W. Lafayette, IN (Oct 1998).
- General Chair, Research Advances in Intrusion Detection (RAID) 99, W. Lafayette, IN (Sept 1999).
- General Co-Chair, Symposium on Requirements Engineering for Information Security; Indianapolis, IN (Mar 5–6, 2001). In cooperation with NCSU, NIST, and ACM SIGSAC.
- General Co-Chair, 2nd Symposium on Requirements Engineering for Information Security; Indianapolis, IN (Oct 16, 2002). In cooperation with NCSU, NIST, ACM SIGSAC, and ACM SIGSOFT.
- Chair, CRA Grand Challenges Conference on Information Security, fall 2003.
- Co-Chair, 3rd SREIS Symposium, in conjunction with the IEEE Conference on Requirements Engineering, Paris France, Sept. 2005.
- Co-chair, Workshop on Web Intelligence for Information Security (WIISe), Lyon, France, August 22, 2011.
- Honorary Conference Chair, ARES 2011, Vienna, Austria, Aug 22-Aug 26, 2011.

Program committee member

- ACM Computer Science Conference (ACM CSC), Feb 1988.
- Winter Usenix Conference, Jan 1989.
- IEEE-CS Special Workshop on Experimental Distributed Systems, Oct 1990.
- 4th DPMA Computer Virus Symposium, Mar 1991. Cosponsored by ACM SIGACT and IEEE-CS.
- 1st National Conference on Computing and Values, sponsored by the Research Center on Computers and Society, Aug 1991.
- 4th ACM Testing, Analysis, and Verification (TAV) Conference, Oct 1991.
- 2nd ACM/IEEE-CS International Symposium on Environments and Tools for ADA (SETA2), Jan 1992.
- 1st ACM Conference on Computer and Communications Security Fall 1993.
- ACM/IEEE-CS Computers, Freedom and Privacy 94 conference (CFP-94), Mar 1994.
- IEEE-CS Workshop on Services in Distributed and Networked Environments (SDNE), Jun 1994.
- Computer Misuses and Anomaly Detection Gurus Workshop, Jan 1995.
- Usenix Symposium on Computer Security, June 1995.
- 2nd IEEE-CS Workshop on Services in Distributed and Networked Environments (SDNE), June 1995.
- 7th FIRST Conference and Workshop on Computer Incident Handling, 1995.
- 16th IEEE International Conference on Distributed Computing Systems (ICDCS-16), May 1996.
- 8th FIRST Conference and Workshop on Computer Incident Handling, 1996.
- The Advances in Parallel and Distributed Systems Conference, Oct 1996.

- 3rd International Conference on Reliability, Quality and Safety of Software-Intensive Systems (ENCRESS '97), Sept 1997.
- Third Working Conference on Communications and Multimedia Security, 1997.
- Sam Nunn/NationsBank Policy Forum, April 1998.
- European Symposium on Research in Computer Security 1998 (ESORICS 98), Sept 1998.
- Workshop on Recent Advances in Intrusion Detection (RAID 1998), Sept 1998.
- 1998 Information Survivability Workshop (ISW '98), Oct 1998.
- 1999 ACM Conference on Computer and Communications Security, Nov 1999.
- ACM Workshop on Scientific Aspects of Cyber Terrorism, Nov 2002.
- First IEEE International Information Assurance Workshop, Mar 2003.
- 18th IFIP International Information Security Conference (SEC-2003), May 2003.
- Second IEEE International Information Assurance Workshop, Mar 2004.
- First International Conference on Intelligence Analysis Methods and Tools, May 2005.
- Third IEEE International Information Assurance Workshop, Mar 2005.
- 2005 NSF Cybersecurity Summit Workshop, San Diego, Dec. 2005.
- ICSE 06 Emerging Results Track, May 2006.
- ACM SAC 2006, Computing Ethics and Human Values Track; Dijon France, April 2006.
- 2nd International Conference on Global E-Security; London, England; April 2006.
- Workshop on Research Directions for Security and Networking in Critical Real-Time and Embedded Systems; San Jose, CA; April 2006.
- The International Conference on Network Security; Reston, VA; April 2006.
- 10th National Colloquium on Information Systems Security Education; Adelphi, MD; June 2006.
- International Conference on Security of Information and Networks; Gazimagusa, Cyprus; May 2007
- 7th Digital Forensics Research Workshop (7-DFRWS); Pittsburgh, PA; August 2007.
- Steering committee for SREIS 2008; Barcelona, Spain; March 2008.
- 2nd Interdisciplinary Studies in Information Privacy and Security, 2008; New Brunswick, NY; May 2008.
- 8th Digital Forensics Research Workshop (8-DFRWS); Baltimore, MD; August 2008.
- 9th DFRWS Conference; Montreal, Canada; August 2009.
- First International Workshop on Requirements Engineering and Law (RELAW); September 2008; Barcelona, Spain
- 2nd ACM International Conference on Security of Information and Networks (SIN 2009); Oct 2009; Famagusta, Cyprus.
- 2nd International ICST Conference on Digital Forensics & Cyber Crime (ICDF2C); Oct 2010; Abu Dhabi.
- 2011 Workshop on Grid and Cloud Security (IEEE WGC-Sec); May 2011; Anchorage, AK

- 2011 Conference on Digital Forensics and Computer Crime (ICDF2C 2011); October 2011; Dublin, Ireland.
- 2012 LASER 2012 -- Learning from Authoritative Security Experiment Results; Arlington, VA; July 2012.
- 28th IFIP TC-11 SEC 2013 International Information Security and Privacy Conference; Auckland, New Zealand; 8-10 July 2013.
- The 6th International Conference on Security of Information Systems (SIN'13) Advisory Committee; Aksaray, Turkey; Sep 2013.
- 2013 Conference on Digital Forensics and Computer Crime (ICDF2C 2013); Sept 2013; Moscow, Russia.
- The 7th International Conference on Security of Information Systems (SIN'14) Advisory Committee; Glasgow, UK; Sep 2014.
- 33rd IFIP TC-11 SEC 2018 International Information Security and Privacy Conference; Poznan, Poland; June 25-27, 2018.

Standards activities

- Balloting member, IEEE Draft Standard for Information Technology – Portable Operating System Interface (POSIX) – Security Interface, P1003.6; 1991–1993.
- Charter member, ACM Technical Standards Committee; 1992–1996.
- Balloting member, IEEE Draft Standard for Recommended Practice for Internet practices — Web Page Engineering — Intranet/Extranet Applications, P2001; 1998.
- Balloting member, IEEE Draft Software Engineering Code of Ethics and Professional Practice 1998.
- Expert committee, ISC² Common Body of Knowledge Editing Committee, 2007–2015.

Miscellaneous activities

- Maintainer and publisher of Usenet on-line documentation and control postings (1981–1993).
- Founding Member, Atlanta Unix User's Group (1985).
- Member, Select Advisory Panel on Software Engineering Education in Ethics, at the Software Engineering Institute, Pittsburgh PA, Jun 1989.
- Advisor to U.S. Attorney's office, FBI, Secret Service, Australian Federal Police, NY State Police, and Columbus (Ohio) Police Computer Crime Unit, (on-going).
- Consultant to U.S. Department of Defense, including the National Security Agency (on-going).
- Consultant to the U. S. Justice Department (on-going).
- Testimony before U. S. House of Representatives, Committee on Science, 11 Feb 1997.
- Brief to Congressional staff on IT issues, March 1999.
- Testimony before U. S. House of Representatives, Committee on Science, 10 Oct 2001.
- Testimony before U. S. House of Representatives, Armed Services Committee Subcommittee on Terrorism, Unconventional Threats and Capabilities, 24 July 2003.

- Testimony before U. S. House of Representatives, Government Reform Committee Subcommittee on Technology, Information Policy, Intergovernmental Relations and the Census, 17 Sep 2003.
- Celebrity judge for “2004 Women of Influence Awards” presented by the Executive Women’s Forum and CSO Magazine.
- Testimony before U. S. House of Representatives, Armed Services Committee, 27 Oct 2005.
- TRUST STC Distinguished External Advisory Board Member, 2006–current.
- Reviewer of NRC reports on cyber security and privacy; 2006-2008.
- Testimony before U. S. House of Representatives, Committee on Veterans’ Affairs, 22 Jun 2006.
- IEEE Computer Society Taylor Booth Award Committee, 2007.
- Testimony before U.S DHS Data Privacy and Integrity Advisory Committee, El Paso, 12 Mar 2008.
- Testimony before U. S. House of Representatives, Ways and Means Committee, May 6, 2008.
- Testimony before U.S. Senate Committee on Commerce, Science, and Transportation, March 19, 2009.
- Member, ISSA International Awards Committee, 2010–2011.
- Member IEEE Education Awards Committee 2010–2017.
- Member ACM SIGSAC Awards Committee 2011.
- Member CRA Distinguished Service Awards Committee 2011.
- ★ Member, Cyber Security Hall of Fame Committee, 2012, 2014-present.
- Chair of NSF Frontiers site review panel, 2015.

SELECTED PRESENTATIONS

Keynote/Plenary Addresses

- Viruses, Worms, and Things That Go “Bump” in the Net at 3rd Annual DPMA Virus Conference; New York, NY; Mar 1990.
- Programmed Threats and a Practical View of Computer Security at National Institutes of Health Computer Security Awareness Seminar; Bethesda, MD; Mar 1990.
- Unix and Security at Austrian Unix Users Group annual conference; Vienna, Austria; Oct 1991.
- Big Brother May Not Be Watching But He Wants to Listen at 23rd Virginia Computer Users Conference; Virginia Tech, Blacksburg, VA; Oct 1993.
- The Human Role in Computing at Science Scholars Day; SUNY Brockport, Brockport NY; Apr 1994.
- Above All, Do No Harm: The Changing Role of Security Incident Response at 5th FIRST Workshop on Incident Response; Boston, MA; June 1994.

- Balancing Rights With Responsibilities in the On-Line Community at Case Western Reserve University Campus Ethics Day Keynote Lecture; Cleveland, OH; Feb 1995.
- The Future of Crime and Security on the Internet at INFOSEC Network Security Conference; London, UK; May 1996.
- How to Tell If Management is Serious About Security at 20th DOE Infosec Security Conference; St. Petersburg, FL; April 1998.
- The Future of Information Security at COMPSEC 1998; London, UK; Nov 1998.
- The Importance of Information Security at Computer Security Day Conference; Mexico City, MX; December 1997.
- Why Was Y2K a Bust? at the Network and Distributed Systems Security Conference; San Diego, CA; Feb 2000.
- Why Open Source Software Only Seems More Secure at the Danish Open Systems Conference; Copenhagen, Denmark; March 2000.
- Why Security Requires Quality Assurance at Quality Week 2000; San Francisco, CA; June 2000.
- *A Small Dose of Infosec* at Supercomputing 2000; Dallas, TX; Nov 2000.
- Convener for The Internet and State Security Forum, Cambridge Review of International Affairs, Cambridge University, May 2001.
- *The Future of Information Security*, IEEE Workshop on Reliability, US Military Academy, West Point, NY, June 2001.
- *The State of Forensics* at the First Workshop on Computer Forensics, Rome, NY, August 2001.
- *The Hidden Meta-Requirements of Security and Privacy*, 5th IEEE International Symposium on Requirements Engineering (RE'01), Toronto, ON, Aug 2001.
- *Thinking Strategically About Information Systems Defense*; AUSCERT 2002; Gold Coast, Australia; May 2002.
- *The State of Information Security*, CSI 29th Annual Computer Security Conference, Chicago IL, Nov 2002.
- *Relating Information Security and Software Engineering*, International Conference on Software Engineering (ICSE), Portland OR, May 2003.
- *Assigning Blame for Poor Computer Security*, Fifth Annual Conference on Computer Ethics-Philosophical Enquiry (CEPE 2003), Boston, MA, June 2003.
- *The Internet Worm: 15 Years Later*; Classic Paper Presentation; 19th Annual Computer Security Applications Conference; Las Vegas, NV; Dec. 2003.
- *What Is Information Security?*; ACM SIGCSE Annual Conference; Norfolk, VA; Mar 2004.
- *Grand Challenges in Information Security*; AUSCERT 2004; Gold Coast, Australia; May 2004.
- *Thoughts on CNA*; (classified) internal conference, National Security Agency; Ft. Meade, MD; Jan 2006.
- *Research in Challenges in Digital Forensics*; IFIP WG 11.9 Annual Conference; Orlando FL; Jan 2006.

- *Challenges and Opportunities in Digital Forensics*; Innovations in Digital Forensic Practice Conference; March 2006.
- *Information Security: Insanity Rules*; AUSCERT 2006; Gold Coast, Australia; May 2006.
- *The “Big Picture” of Cyber Security*; NCISE 2006; College Park, MD; June 2006.
- *Security on the Horizon*, Motorola Security Conference, Itasca IL, Sept. 2006.
- *Information Security: Insanity Rules*, IEEE MetroCon, Fort Worth, TX, Oct. 2006.
- *Current Challenges in Information Security*, Norwich University Infosec Commencement Conference, Northfield VT, June 2008.
- *Information Security: Some Past Successes, Some Future Challenges*, Innaugural Founder’s Day Symposium Keynote, University of Texas San Antonio Institute for Cyber Security, San Antonio, TX, Nov 2008.
- *Questioning What You Think You Know*, TRUST 2009 Conference, Oxford England, Mar. 2009.
- *Thinking Outside the Box*, Twelfth SDPS Transdisciplinary Conference - Workshop on Integrated Systems, Design & Process Science, Montgomery AL, Oct 2009.
- *Buzzwords: New Doesn't Always Mean Better*, Indiana Bankers Association, Rising Sun, IN, Oct 2009.
- *Thinking outside the Box*, ARES 2010 Conference, Krakow Poland, Feb 2010.
- *Soup to Nuts; CSIT Symposium*; Mountain View, CA; July 12, 2010.
- *International Cybercrime Challenges*; 2nd International ICST Conference on Digital Forensics & Cyber Crime (ICDF2C); Abu Dhabi, Oct. 2010. (Was unable to attend)
- *The Nature of Cyber Security*; Worldcomp’11; Las Vegas, NV; July 18, 2011.
- *Some Thoughts on Cyber Security & Privacy*; ARES 2011 Conference; Vienna Austria; August 2011.
- *Inside, Outside -- But Clearly Not on *Our* Side*; MIST 12 Workshop; Kyushu University, Fukuoka, Japan; Nov 2012.
- *The State of Information (In)Security*; ISSA International Conference; Nashville, TN; Oct 2013.
- *What is Cyber Security?*; US Naval Academy Science and Engineering Conference; Annapolis, MD; Nov 2013.
- *Drawing Lines: Security, Privacy, and Public Interest*; ICCWS 2014; West Lafayette, IN; March 2014.
- *Why Aren't Our Systems Secure?*; 3rd Annual Greater Chicago Area System Research Workshop (GCASR); Chicago, IL; May 2014.
- *The Challenges of Information Security and Privacy*; 25th Anniversary Celebration of CS; SUNY College at Brockport; Brockport, NY; Nov 2014.
- *The State of Cyber Security*; Indianapolis Infragard/FBI Security Summit; Indianapolis, IN; March 2015.
- *Rethinking The Nature of Security*; NorduSec 2015; October 2015; Stockholm Sweden.

- *A Different View of Cyber Security*; 11th Annual Cyber and Information Security Research (CISR) Conference; Apr 2016.
- *What's Next in Cyber Security?*; ITERA Annual Conference 2016; April 2016.
- *Thinking Differently About Security*; 2016 ISSA Rocky Mountain Security Conference; May 2016.
- *Stepping Back From Cyber Security*; 9th International Conference on Security of Information and Networks (SIN 2016); Newark, NJ; July 2016.
- *Reflections on the State of Cyber Security*; 32nd IFIP SEC Conference; Rome, Italy; May 2017.
- *The Future of Cyber Security Education*; 21st CISSE Symposium; Las Vegas, NV; May 2017.
- *The Struggle with Malware*; Annual 9th Malware TEM; McLean, VA; June 2017.
- *Whither Cyber Security*; 2nd AvengerCON; Ft. Meade, MD; Nov. 2017.
- *How Well Are We Meeting the Challenge?*; DRFWS 2018; Providence, RI; Jul 2018.

Distinguished Lecture Series

- *Programmed Threats to Computer Security* at NASA Advances in Computational Science seminar series; Greenbelt, MD; Jan 1990.
- *Ethics, Viruses, and Computer "Vandalware"* at Rose-Hulman/ GTE Foundation lecture series on Computers and Ethics; Terre Haute, IN; Oct 1990.
- *Scenarios in Computer Ethics* at Rose-Hulman/ GTE Foundation lecture series on Integrating Ethics into Technical Education; Terre Haute, IN; March 1993.
- *What's So New About Cyberspace?* at University of Idaho/ GTE Foundation lecture series on Crime and Ethics in Computing; Moscow, ID; April 1993.
- *Surviving the Internet, by Analogy* at Bellcore General Colloquium Series; Morristown, NJ; October 1995.
- *Internet: Threat or Menace? Some Observations on Crime on the Internet* at University of Florida Barr Systems Distinguished Lecture Series; Gainesville, FL; November 1995.
- *Information Security: Far More than Computer Security* at HP/Royal Holloway Security Distinguished Lecture Series; Egham, UK; December 1999.
- *Musings on Disclosure and Vulnerabilities* as the Distinguished Lecture at the Applied Computer Security Conference (ACSAC); New Orleans; Dec 2000.
- *The Future of Information Security*, Troy State Distinguished IT Lecture Series, Montgomery, AL, March 2001.
- *The Challenge of Secure Software*, GTISC (Georgia Tech Information Security Center) Distinguished Lecture Series, Atlanta, GA, October 2001.
- *Why is Information Security Difficult?*, LLNL Lab Director's Lecture Series, Livermore, CA, May 2001.
- *The Challenge of Producing Secure Software*, NSF CISE Distinguished Lecture Series, Arlington, VA, December 2001.

- *Looking to the Future of Information Assurance*, NASA Information Science and Technology Colloquium, NASA Goddard SFC, MD, April 2002.
- *Myths, Fads, and False Economies: How NOT to Get Secure Systems*, University of Delaware CS Distinguished Lecture Series, October 2002.
- *Myths, Fads, and False Economies: How NOT to Get Secure Systems*, University of Pittsburgh, CS 30th Anniversary Distinguished Lecture Series, November 2002.
- *Myths, Fads, and False Economies: How NOT to Get Secure Systems*, Colorado State University ISTECS Distinguished Lecture Series, November 2002.
- *Challenging Conventional Wisdom*, Colorado State University BMAC Distinguished Lecture Series, November 2002.
- *Myths, Fads, and False Economies: How NOT to Get Secure Systems*, Air Force Institute of Technology, Dayton OH, January 2003.
- *Myths, Fads, and False Economies: How NOT to Get Secure Systems*, Indiana Chief Security Officer's Summit, Fishers IN, January 2003.
- *Myths, Fads, and False Economies: How NOT to Get Secure Systems*, Silicon Flatirons Telecommunications Program, University of Colorado, January 2003.
- *Myths, Fads, and False Economies: How NOT to Get Secure Systems*, University of Chicago Distinguished Lecture Series, January 2003.
- *Myths, Fads, and False Economies: How NOT to Get Secure Systems*, Louisiana State University CS Distinguished Lecture Series, March 2003.
- *Myths, Fads, and False Economies: How NOT to Get Secure Systems*, Dartmouth College Jones Seminar Series, May 2003.
- *The Role of Academia in Cyber Security*; Texas A&M University; University Fall Colloquium; Commerce, TX; Sept 2004.
- *Grand Challenges in Information Security*; St. Michael's College; Centennial Address; Nov 2004.
- *Grand Challenges in Information Security*; Los Alamos National Laboratories; Director's Colloquium; Nov 2004.
- *Information Security: Past, Present and Future*; Southern Methodist University; Distinguished Lecture Series; Nov 2004.
- *Information Security: Past, Present and Future*; University of Texas, Dallas; Distinguished Lecture Series; Feb 2005.
- *Information Security: Past, Present and Future*; Eastern Tennessee State University; Distinguished Lecture Series; Feb 2005.
- *The Cyber Security Crisis*; NTNU Distinguished Lecture Series, Trondheim, Norway; Oct. 2005.
- *The Cyber Security Crisis*, SUNY Buffalo Distinguished Lecture Series, Apr 2006.
- *The Cyber Security Crisis*, Tufts University Distinguished Lecture Series, Apr 2006.
- *The Cyber Security Crisis*, Fermilab Distinguished Lecture Series, May 2006.
- *Cyber Security: A Crisis of Prioritization*, Distinguished Seminar Series, Korean Information Security Agency, Seoul Korea, Sept 2006.

- *The Cyber Security Crisis*, Distinguished Visitor Lecture, National Security Research Institute, Daejeong, Korea, Sept 2006.
- *Trends in the Security Landscape*, DSRC Distinguished Lecture, KAIST, Korea, Sept 2006.
- *Challenges in Cyber Forensics*, University College Lecture Series, Dublin Ireland, Oct., 2006.
- *Cyber Security: Insanity Rules*, University of Delaware Distinguished Lecture Series, University of Delaware, Dec 2006.
- *Cyber Security: Insanity Rules*, Temple University Distinguished Lecture Series, Philadelphia Apr 2007.
- *The Value in Questioning What You Think You Know*; Indiana University Distinguished Lecture Series; Nov 2007.
- *The Value in Questioning What You Think You Know*; Kansas State University Distinguished Lecture Series; Dec 2007.
- *The Value in Questioning What You Think You Know*; Institute for Human-Machine Computation Distinguished Lecture Series; Jan 2008.
- *The Value in Questioning What You Think You Know*; Florida Institute of Technology Distinguished Lecture Series; Feb 2008.
- *Thinking Outside the Box*, Tufts University, Sep 2009.
- *Thinking Outside the Box*, Virginia Tech University, Oct 2009.
- *Why Aren't Our Systems Secure?*; CCIT Distinguished Lecture; Clemson University; Apr 2014.
- *Why Aren't Our Systems Secure?*; ITI Distinguished Lecture Series; University of Illinois; Apr 2014.
- *Faster Than Our Understanding*; Dawn or Doom? Series; Purdue University; Sept 2014.
- *The Challenge of Cyber Security*; Ideas and Intersections Series; University of Iowa; April 2015.
- *Balancing Privacy and Security*; Dawn or Doom 2; Purdue University, Sept 2015.
- *Truth and Consequences*; University of Central Florida Distinguished Lecture; Sept 2015.
- *Truth and Consequences*; Texas A&M University Distinguished Lecture; Dec 2015.
- *A View of Challenges in Security and Privacy*; Google Security & Privacy Week; Oct 2015.
- *Some Musings on Cyber Security by a Cyber Iconoclast*; Alvine Lecture Series; University of New Haven; Apr 2016.
- *Cyberworld: Advancing Too Quickly to Secure*; Purdue-India Lecture Series in honor of Bharat Ratna Professor C.N.R Rao at IIT Delhi.

Invited conference addresses

- *Integrating Debugging and Testing* at NSIA/NASA/NIST/ASQC/SSQ/AIA/EIA Joint Conference on Software Defects; Alexandria VA; Mar 1989.
- *Anatomy of Worms and Viruses* at 2nd Annual DPMA Virus Workshop; New York NY; Mar 1989.

- *Worms, Viruses, and Computer Break-ins* at Computer Security Institute Spring Conference; Chicago, IL; May 1989.
- *Worms, Viruses, and Computer Break-ins* at SHARE IBM conference; Denver, CO; May 1989.
- *Worms, Viruses, and Computer Break-ins* at Ameritech Computer and Network Security Conference; Cleveland, OH; Jun 1989.
- *Computer Ethics* at American MENSA Annual Meeting; Atlanta, GA; Jul 1989.
- *The Internet Worm: Crisis and Aftermath* at SHARE European Association (SEAS) Anniversary Meeting; Amsterdam, Netherlands; Sep 1989.
- *Anatomy of Computer Viruses* at Second Conference on Artificial Life; Santa Fe, NM; Feb 1990.
- *The Internet Worm: How did it happen? Can it happen again?* at North American Data Security Symposium; Toronto, ON; Oct 1990.
- *Securing Unix* at Virus Bulletin International Conference on Security; Jersey, UK; Sep 1991.
- *Policies and Planning Can Prevent Security Incidents* at Fourth FIRST Workshop on Computer Security Incident Handling; Denver, CO; Aug 1992.
- *Trojans, Virus, Worms and Tools to Contain Them* at American Society for Industrial Security, Annual Conference; Baltimore, MD; May 1993.
- *The Pros and Cons of Disclosure* at USENIX Conference on Systems Administration and Network Security (SANS); Washington DC; May 1995.
- *Cops and Robbers on the Information Superhighway* at AFCEA Binannual Conference; San Antonio, TX; May 1996.
- *Network Intrusion Detection and Response* at INFOSEC Conference on Network Security; London, UK; May 1996.
- *A New View of Incident Response* at USENIX Conference on Systems Administration and Network Security (SANS); Washington DC; May 1996.
- *The Hacker Threat* at Department of Energy Information Systems Security Conference; Germantown, MD; October 1997.
- *Some Observations on Vulnerabilities* at CompSec 97; London, UK; November 1997.
- *The Computer Security Threat* at XWIT Workshop on Electronic Threats; San Francisco, CA; March 1998.
- *The Computer Security Threat* at Sam Nunn Forum; Atlanta, GA; April 1998.
- *The Nature of Information Security Education* at the NCISSE; James Madison University, VA; May 1998.
- *How to Tell if Management is Serious About Information Security* at COMPSEC 1998; London, UK; Nov 1998.
- *Network Risk Management Post-Y2K* at NETSEC 1999; Utrecht, Netherlands; Oct 1999.
- *Information Security Requires Assurance*, Quality Week 200, San Francisco, CA, Jun 2000.
- *A Small Dose of Infosec*, Supercomputing 2000, Dallas, TX, Nov 2000.
- *The State of Cybersecurity*, DoE WWW Conference, Los Alamos, NM, Feb 2001.

- *Open Source vs. Security*, Extreme Linux Conference, Santa Fe, NM, Feb 2001.
- *Summary Comments on Security*, Cambridge Review Internet and State Security Forum, Cambridge UK, May 2001.
- *Legal Challenges in the Cyber Future*, National Association of Attorneys General, Oxford, MS, Sep 2003.
- *What Comes Next in Cybersecurity Research?*, at the Cybersecurity Symposium, Colorado Springs, CO, Sep 2003.
- *The State of Information Security*, at the Los Alamos Computer Security Institute, Santa Fe, NM, Oct 2003.
- *Challenges in Cybercrime Investigation*, DoD Cybercrime Investigator's Conference, Las Vegas, NV, Dec 2003.
- *A Failure to Learn from the Past*, ACSAC 2003 Classic Paper, Las Vegas, NV, Dec 2003.
- *Why We Don't Have Secure Systems Yet*; Online ISSA IT Security E-Symposium; Nov. 2005.
- *Future Threats*; Executive Security Action Forum (RSA Conference); San Jose, CA; Feb 2006.
- *The Past and Future of Information Security*; AAAS Annual Conference; Feb 2006.
- *Putting IT All Together*, The Security Standard/Vortex Conference, Sept. 2006.
- *Cybersecurity Challenges*, ISSA & Georgetown Conference on Cybersecurity and the Law, Nov. 2006.
- Panel on Emerging Threats in the Symposium on Emerging Trends in Information Security & the Law: "Plausible Deniability is Dead"; Georgetown Law School; Washington, DC; Nov. 2006.
- *Are we on track?*; luncheon address at the NSF Cyber Trust PI meeting; Atlanta, GA; Jan 2007.
- *Evoting Assurance*; National Academy of Engineering Symposium in Honor of Bill Wulf; Irvine CA; Feb 2007.
- *The Balance Between Security and Privacy*; 2nd Interdisciplinary Studies in Information Privacy and Security, 2008; New Brunswick, NY; May 2008.
- *How Do We Secure Cyberspace?*; World Knowledge Forum; Seoul, Korea; Oct 2013.
- *The Challenge of Security and Privacy in Computing*; European Computer Science Summit; Wroclaw, Poland; Oct 2014.
- *Using Deception in Cyber Security*; COINS; October 2015; Stockholm Sweden.

THESIS STUDENTS

Ph.D. Advisees

- Hiralal Agrawal; 1991; Towards Automatic Debugging of Computer Programs. (Co-advisor with R. A. DeMillo).
– Currently with Vencore Labs.

- Hsin Pan; 1993; Debugging with Dynamic Instrumentation and Test-Based Information. (Co-advisor with R. A. DeMillo).
– Currently with Infosys.
- Steve J. Chapin; 1993; Scheduling Support for an Internetwork of Heterogeneous, Autonomous Processors.
– Currently on the technical staff of Lawrence Livermore National Laboratories.
- Chonchanok Viravan; 1994; Fault Investigation and Trial.
– Currently CEO of Pathanasomdoon Co, Ltd., Thailand.
- Sandeep Kumar; 1995; Classification and Detection of Computer Intrusions.
– Currently with VMware, CA.
- Christoph Schuba; 1997; On the Modeling, Design, and Implementation of Firewall Technology.
– Currently with Apple Computer, CA.
- Ivan Krsul; 1998; Classification and Analysis of Computer Vulnerabilities.
– Currently with Arte Xacta in La Paz, Bolivia.
- Diego Zamboni; 2001; Intrusion Detection Using Internal Sensors and Embedded Detectors.
– Currently with Swisscom Switzerland.
- Wenliang Kevin Du; 2001; Privacy-Preserving Cooperative Computations.
– Currently on the faculty at Syracuse University, NY.
- Thomas Daniels; 2002; Reference Models for the Concealment and Observation of Origin Identity in Store and Forward Networks.
– Currently on the faculty at Iowa State University, IA.
- Ben Kuperman; 2004; A Categorization of Computer Security Monitoring Systems and the Impact on the Design of Audit Sources.
– Currently with Marketo, WA.
- Florian Buchholz; 2005; Pervasive Binding of Labels to System Processes.
– Currently on the faculty at James Madison University, VA.
- James Early; 2005; Behavioral Feature Extraction for Network Anomaly Detection.
– Currently on the faculty of SUNY Oswego, NY.
- Paul D. Williams, 2005; CUPIDS: Increasing Information System Security Through the Use of Dedicated Coprocessing.
– Currently with Rackspace, TX.
- Brian Carrier; 2006; A Hypothesis-Based Approach to Digital Forensic Investigations.
– Currently with Basis Technology, Cambridge MA.
- Rajeev Gopalakrishna; 2006; Improving Software Assurance Using Lightweight Static Analysis (co-advisor with J. Vitek).
– Currently with Zenviron.io, India.
- Serdar Cabuk; 2006; Network Covert Channels: Design, Analysis, Detection, And Elimination; (co-advisor with C. Brodley; ECE).
– Currently with IBM, London, UK

- Maja Pusara , 2007; An Examination of User Behavior for User Re-authentication; (co-advisor with C. Brodley; ECE)
— Currently with ABINITO, Boston MA.
- Dannie Stanley, 2014; Improved Kernel Security Through Code Validation, Diversification, and Minimization; (co-advisor with Dongyan Xu).
— Currently on the faculty at Taylor University, IN, US.
- Mohammed Almeshekah, 2015; Using Deception to Enhance Security: A Taxonomy, Model, and Novel Uses.
— Currently on the faculty at King Saud University, Riyadh, Saudi Arabia.
- Kelley Misata, 2016 (INSC); Gap Analysis Identifying the Current State of Information Security within Organizations Working with Victims of Violence; (co-advisor with Marc Rogers, CNIT).
- Jeff Avery, 2017 The Application of Deception to Software Security Patching.
— Currently with Northrop Grumman.
- Christopher Gutierrez, 2017 Deceptive Memory Systems; (co-advisor with Saurabh Bagchi, ECE).
— Currently on at Intel Corporation.
- Robert Morton, 2019 (expected in INSC).
- Boakye Dankwa, 2022 (expected).

Ph.D. Committees/External Examiner

- Shirley V. Browne; 1990; Quorum-Based Recovery in Replicated Database Systems.
- Shy-Renn Lian; 1990; On Increasing Reliability and Availability in Distributed Database Systems.
- Enrique Mafla; 1990; Experimental Studies in Distributed Transaction Processing.
- ByoungJu Choi; 1990; Software Testing Using High-Performance Computers.
- James Griffioen; 1991; A Virtual Memory Operating System for a Distributed Workstation Environment.
- Kenneth R. Rodemann; 1991; Route Adaption and Persistence in Networks.
- Abdelsalam Helal; 1991; Adaptability to Failures in Distributed Systems.
- Edward W. Krauser; 1991; Compiler-Integrated Software Testing.
- Wei Jen Yeh; 1993; Controlling State Explosion in Reachability Analysis.
- Lih-Chyun Shu; 1994; Concurrency Control and Scheduling for Hard Real-Time Systems.
- Paul C. Clark at George Washington University; 1994; BITS: A Smartcard Protected Operating System.
- Lt. Col. Christopher Feudo at George Washington University; 1994; Feasibility of Computer Viruses as an Electronic Warfare Tool.
- James B. Armstrong in Purdue EE; 1994; Selected Software Issues for Mapping Tasks onto Parallel Processing Systems.
- Xu Lu; 1995; Two-Dimensional Program Debugging.

- Abdelaziz Mounji at University of Namur, Belgium; 1997; Languages and Tools for Rule-Based Distributed Intrusion Detection.
- Steven A. Hofmeyr at the University of New Mexico; 1999; An Immunological Model of Distributed Detection and Its Application to Computer Security.
- Terran Lane; 2000 in Purdue ECE; Machine Learning Techniques for the Computer Security Domain of Anomaly Detection.
- Hoi Chang; 2003; Building Self-Protecting Software with Active and Passive Defenses.
- James Joshi at Purdue ECE; 2003; A Generalized Temporal Role-Based Access Control Model for Developing Secure Systems.
- Xuxian Jiang; 2006; Enabling Internet Worms and Malware Investigation and Defense Using Virtualization.
- Mahesh Tripunitara; 2006; A Theory Based on Security Analysis for Comparing the Expressive Power of Access Control Models.
- Bradley Schatz, Queensland Institute of Technology, Australia, 2007, as external examiner; Digital Evidence: Representation and Assurance.
- William Speirs; 2007; Dynamic Cryptographic Hash Functions.
- Abhilasha Bhargav Spantzel; 2007; Protocols and Systems for Privacy Preserving Protection of Digital Identity.
- Roman Chertov; 2008; A Device Independent Router Model: From Measurements to Simulations.
- Svein Yngvar Willassen, NTNU, Trondheim, Norway, 2008, (as external disputas committee member); Methods for Enhancement of Timestamp Evidence in Digital Investigations.
- Hyojeong Kim; 2008; Memory Balancing for Large-Scale Network Simulation in Power-Law Simulation.
- Lorraine G. Kisselburgh at Purdue COMM, 2008; The Social Structure and Construction of Privacy in Sociotechnical Realms.
- Travis D. Breaux; North Carolina State University, 2009; Frame-Based Requirements Analysis Method.
- Ryan Riley; 2009; Architectural Approaches for Code Injection Defense at the User and Kernel Levels.
- Ziqing Mao, 2009; Improving Real-World Access Control Systems by Identifying the True Origins of a Request.
- Mummoorthy Murugesan, 2010; Privacy Through Deniable Search.
- Junghwan Rhee, 2011; Data-Centric Defenses to Kernel Malware Defense.
- Zhiqiang Lin, 2011; Reverse Engineering of Data Structures from Binary.
- Sundararaman Jeyaraman, 2011; Practical Automatic Determination of Causal Relationships in Software Execution Traces.
- Jacques Thomas; 2011; Mandatory Access Control.
- Robert Winkworth, Purdue TECH; 2015; An Approach to Near Field Data Selection in Radio Frequency Identification.

- Daniel F. Smith; University of Queensland, Australia; 2015; Countering Digital Replay Attacks for Face Verification in Consumer Smart Devices Using Structured Illumination.
- Ashrith Barthur; Purdue INSC; 2016; Computational Environment for Modeling and Analysing Network Traffic Behaviour using the Divide and Recombine Framework.
- Amiya Kumar Maji, Purdue ECE, 2018 (expected).

MS Thesis Advisees

- Christoph Schuba; 1993; Addressing Weaknesses in the Domain Name System Protocol.
- Ivan Krsul; 1994; Authorship Analysis: Identifying the Author of a Program.
- Taimur Aslam; 1995; A Taxonomy of Security Faults in Operating Systems.
- Katherine E. Price; 1997; Host-Based Misuse Detection and Conventional Operating Systems' Audit Data Collection.
- David L. Wilson; 2004; Risk Perception and Trusted Computer Systems: Is Open Source Software Really More Secure Than Proprietary Software?; (co-advisor with Josh Boyd).
- William A. Fraunhofer; 2004; Privacy and Technology Definition and Policy.
- Courtney A. Falk; 2005; The Ethics of Cryptography.
- Kristine Arthur-Durett; 2014; The Weakness of WinRAR Encrypted Archives to Compression Side-channel Attacks.
- Christopher Flory; 2015; Digital Forensics and Community Supervision.
- Teri Flory; 2015; Digital Forensics in Law Enforcement: A Needs Based Analysis of Indiana Agencies.

MS Thesis Committees

- Christoph Schäfers; 1989; Analysis of a Congestion Control and Avoidance Algorithm for a High-Speed Packet Switched Network.
- Steven J. Varnau; 1991; Requirements and Specifications for an Integrated Software Engineering Environment Kernel.
- Mark G. Reith at Air Force Institute of Technology; 2003; Searching System Call Information for Clues: The Effects of Intrusions on Processes.
- James Hinde; 2004; Trusted Computing: the Debate Over Making Cyberspace Safe For Commerce.
- Nipoon Malhotra; 2004; Robust Location Determination in Wireless Ad-Hoc Networks
- Matthew L. Meyers; 2005; Computer Forensics: Towards Creating a Certification Framework.
- Vinita N. Apte; 2006; Distributed Intrusion Detection for Voice-Over-IP Environments.