Matthew Allen Bishop

Address

Department of Computer Science
University of California at Davis
One Shields Ave.
Davis, CA 95616-8562
United States of America

phone: +1 (530) 752-8060
fax: +1 (530) 752-4767
email: mabishop@ucdavis.edu
web: http://seclab.cs.ucdavis.edu/~bishop
office: 2209 Watershed Sciences

Work History

- July 2004–*current*: Professor
  Department of Computer Science, University of California at Davis
- July 1997–June 2004: Associate Professor
  Department of Computer Science, University of California at Davis
- July 1993–June 1997: Assistant Professor
  Department of Computer Science, University of California at Davis
- July 1987–June 1993: Assistant Professor
  Department of Mathematics and Computer Science, Dartmouth College
- October 1984–June 1987: Research Scientist
  Research Institute for Advanced Computer Science, NASA Ames Research Center
- May 1982–August 1982 *and* May 1983–September 1984: Systems Programmer
  Megatest Corporation

Education

- Ph.D. in Computer Science from Purdue University, West Lafayette, IN (May 1984)
  THESIS TITLE: *Practical Take-Grant Systems: Do They Exist?*
  THESIS ADVISOR: Prof Dorothy Denning
- M.S. in Computer Science from Purdue University, West Lafayette, IN (May 1981)
- M.A. in Mathematics from the University of California at Berkeley, Berkeley, CA (June 1978)
- A.B. in Astronomy and Applied Mathematics from the University of California at Berkeley, Berkeley, CA (June 1976)

Publications

Books

1. M. Bishop, *Computer Security: Art and Science, Second Edition*, Addison-Wesley Professional, Boston, MA. (2018); ISBN: 978-0-321-71233-2 (1390+l pages).
2. M. Bishop, *Introduction to Computer Security*, Addison-Wesley Professional, Boston, MA (2005); ISBN: 978-0-321-24744-5 (747+xxxii pages).
3. M. Bishop, *Computer Security: Art and Science*, Addison-Wesley Professional, Boston, MA (2003); ISBN: 978-0-201-44099-7 (1084+xli pages).

Book Chapters

4. M. Bishop, "Insider Threat," article in *Encyclopedia of Cryptography, Security, and Privacy, Third Edition*, S. Jajodia, P. Samarati, and M. Yung, eds., Springer Berlin Heidelberg, Germany; DOI: 10.1007/978-3-642-27739-9_1586-1.
5. M. Bishop, D. Burley, and L. Futcher, "Cybersecurity Curricular Guidelines," chapter 9 in *Cybersecurity Education for Awareness and Compliance*, I. Vasileiou and S. Furnell, eds., IGI Global, Hershey, PA, USA; ISBN: 978-1-5225-7847-5.

6. C. Probst, J. Hunker, D. Gollmann, and M. Bishop, "Aspects of Insider Threats," Chapter 1 in *Insider Threats in Cyber Security and Beyond*, C. Probst, J. Hunker, D. Gollmann, and M. Bishop, eds., Springer Verlag, Berlin (2010); ISBN: 978-1-4419-7133-3.

7. M. Bishop, S. Engle, D. Frincke, C. Gates, F. Greitzer, S. Peisert, and S. Whalen, "A Risk Management Approach to the 'Insider Threat'," Chapter 6 in *Insider Threats in Cyber Security and Beyond*, C. Probst, J. Hunker, D. Gollmann, and M. Bishop, eds., Springer Verlag, Berlin (2010); ISBN: 978-1-4419-7133-3.

8. M. Bishop, "Mathematical Models of Computer Security," Chapter 9 in *Computer Security Handbook*, 5th Edition, S. Bosworth and M. Kabay, eds., John Wiley and Sons, Hoboken, NJ (2008); ISBN: 978-0-471-71652-5.

9. M. Bishop, "Security Management and Policies," Chapter 4.2 in *Handbook of Network and System Administration*, J. Bergstra and M. Burgess, eds., Elsevier, Burlington, MA (2007); IISBN: 978-0-444-52198-9.

10. M. Bishop, "Psychological Acceptability Revisited," Chapter 1 in *Designing Secure Systems That People Can Use*, by L. Cranor and S. Garfinkel, O'Reilly and Associates, Petaluma, CA (2005); ISBN: 978-0-596-00827-7.

11. M. Bishop, S. Cheung, J. Frank, J. Hoagland, S. Samorodin, and C. Wee, "Internet Security," Chapter 7 in *Statistical Methods in Computer Security*, by W. Chen, Marcel Dekker, Inc., New York, NY (2004); ISBN: 978-0-8247-5939-1.

12. M. Bishop, "Computer Viruses," Article 6.45.6.3 in *Encyclopedia of Life Support Systems: Encyclopedia of Technology, Information, and Systems Management Resources*, Z. Nabavi and D. Kaeli, eds., UNESCO, Geneva, Switzerland; http://www.eolss.net (2002); ISBN: 978-1-84826-677-3.

13. M. Bishop, "Authentication," Chapter 7 in *UNIX Unleashed*, 4th Edition, by A. Johnston and R. Anderson, SAMS, Inc., Indianapolis, IN (2001); ISBN: 978-0-672-32251-8.

Papers

2021

14. R. Aranovich, M. Wu, D. Yu, K. Katsy, B. A. Bosari, M. Bishop, V. Filkov, and K. Sagae, "Beyond NVD: Cybersecurity meets the Semantic Web," to appear in the *Proceedings of the 2021 New Security Paradigms Workshop* (Oct. 2021).

15. M. Bishop, I. Ngambeki, S. Mian, J. Dai, and P. Nico, "Measuring Self-Efficacy in Secure Programming," *Proceedings of the 14th World Conference on Information Security Education* pp. 81–92 (June 2021); DOI: 10.1007/978-3-030-80865-5_6.

16. R. Hosler, X. Zou, and M. Bishop, "Electronic Voting Technology Inspired Interactive Teaching and Learning Pedagogy and Curriculum Development for Cybersecurity Education," *Proceedings of the 14th World Conference on Information Security Education* pp. 28–43 (June 2021); DOI: 10.1007/978-3-030-80865-5_3.

17. M. Bishop, L. Drevin, L. Futcher, W. Leung, N. Miloslavskaya, E. Moore, J. Ophoff, and S. von Solms, "A Brief History and Overview of WISE," *Proceedings of the 14th World Conference on Information Security Education* pp. 3–9 (June 2021); DOI: 10.1007/978-3-030-80865-5_1.

18. S. Furnell, P. Haskell-Dowland, M. Agrawal, R. Baskerville, A. Basu, M. Bishop, J. Cuellar, S. Foresti, L. Futcher, N. Gal-Oz, T. Herath, C. Damsgaard Jensen, A. Johnson, W. Joosen, G. Livraga, J. Lopez, S. Marsh, F. Martinelli, F. Massacci, A. Pasic, S. Schinagl, A. Shahim, K.-L. Thompson, J. Vaidya, T. Vance, and M. Warkentin, "Information Security and Privacy – Challenges and Outlook," *Advancing Research in Information and Communication Technology* pp. 383–401 (2021); DOI: 10.1007/978-3-030-81701-5_16.

19. C. Pontes, M. Souza, J. Gondim, M. Bishop, and M. Marotta, "A New Method for Flow-Based Network Intrusion Detection Using the Inverse Potts Model," *IEEE Transactions on Network and Service Management* (2021); DOI: 10.1109/TNSM.2021.3075503.

2020

20. A. Singer and M. Bishop, "Trust-Based Security; Or, Trust Considered Harmful," *Proceedings of the 2020 New Security Paradigms Workshop* pp. 76–89 (Oct. 2020); DOI: 10.1145/3442167.3-442179.

21. S. Furnell and M. Bishop, "Education for the Multifaith Community of Cybersecurity," *Proceedings of the 13th World Information Security Education Conference* pp. 32–45 (Sep. 2020); DOI: 10.1007/978-3-030-59291-2_3.

22. R. Gegan, B. Perry, D. Ghosal, and M. Bishop, "Insider Attack Detection for Science DMZs Using System Performance Data," *Proceedings of the Sixth IEEE Workshop on Security and Privacy in the Cloud* pp. 1–9 (June 2020); DOI: 10.1109/CNS48642.2020.9162260.

23. R. Sun, M. Botacin, N. Sapountzis, X. Yuan, M. Bishop, D. Porter, X. Li, A. Gregio, and D. Oliveira, "A Praise for Defensive Programming: Leveraging Uncertainty for Effective Malware Mitigation," *IEEE Transactions on Dependable and Secure Computing* (Apr. 2020); DOI: 10.1109/TDSC.2020.2986112.

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26. J. Clark, M. Bishop, and C. Hoke, "Introduction to the Minitrack on Inside the Insider Threat," *Proceedings of the 53rd Hawaii International Conference on System Sciences* pp. 2228–2229 (Jan. 2020); DOI: 10.24251/HICSS.2020.272.

2019

27. M. Dupuis, M. Bishop, B. Lagesse, C. Bejan, and S. David, "Design Patterns for Compensating Controls for Securing Financial Sessions," *Proceedings of the 2019 International Workshop on Security Measurements of Cyber Networks* (Aug. 2019); DOI: https://doi.org/10.1109/Smart-World-UIC-ATC-SCALCOM-IOP-SCI.2019.00260.

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2018

32. I. Ngambeki, J. Dai, P. Nico, and M. Bishop, "Concept Inventories in Cybersecurity Education: An Example from Secure Programming," *Proceedings of the 2018 IEEE Frontiers in Education Conference* pp. 1–5 (Oct. 2018); DOI: 10.1109/FIE.2018.8658474.

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37. W. Conklin and M. Bishop, "Contrasting the CSEC 2017 and the CAE Designation Requirements," *Proceedings of the 51st Hawaii International Conference on System Sciences* pp. 2435–2441 (Jan. 2017); DOI: 10.24251/HICSS.2018.306.

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2017

39. S. Peisert, M. Bishop, and E. Talbot, "A Model of Owner Controlled, Full-Provenance, Non-Persistent, High-Availability Information Sharing," *Proceedings of the 2017 New Security Paradigms Workshop* pp. 80–89 (Oct. 2017); DOI: 10.1145/3171533.3171536.

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45. H. Fu, Z. Zheng, S. Bose, M. Bishop, and P. Mohapatra, "LeakSemantic: Identifying Abnormal Sensitive Network Transmissions in Mobile Applications," *IEEE Conference on Computer Communications* pp. 1–9 (May 2017); DOI: 10.1109/INFOCOM.2017.8057221.

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rity: Creating Authoritative, Actionable Knowledge When Speed Matters," *Proceedings of the 50th Hawaii International Conference on System Sciences* pp. 5958–5967 (Jan. 2017); DOI: 10.24251/HICSS.2017.723.

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2016

52. R. Sun, A. Lee, A. Chen, D. Porter, M. Bishop, D. Oliveira, "Bear: A Framework for Understanding Application Sensitivity to OS (Mis) Behavior," *Proceedings of the 27th IEEE International Symposium on Software Reliability Engineering* pp. 388–399 (Oct. 2016); DOI: 10.1109/ISSRE.2016.18.

53. M. Fioravanti II, M. Bishop, and R. Ford, "I'm Not Sure If We're Okay: Uncertainty for Attackers and Defenders," *Proceedings of the 2016 New Security Paradigms Workshop* pp. 1–10 (Sep. 2016); DOI: 10.1145/3011883.3011889.

54. M. Dark, L. Stuart, I. Ngambeki, and M. Bishop, "Effect of the Secure Programming Clinic on Learners' Secure Programming Practices," *Proceedings of the 20th Colloquium on Information Systems Security Education* pp. 1–18 (June 2016); URI: https://cisse.info/archives/category/41-papers.

55. B. Copos, K. Levitt, M. Bishop, and J. Rowe, "Is Anybody Home? Inferring Activity From Smart Home Network Traffic," *Proceedings of the 2016 IEEE Security and Privacy Workshops* pp. 245–251 (May 2016); DOI: 10.1109/SPW.2016.48.

56. D. Burley, M. Bishop, E. Hawthorne, S. Kaza, S. Buck, and L. Futcher, "Special Session: ACM Joint Task Force on Cyber Education," *Proceedings of the 47th ACM Technical Symposium on Computing Science Education* pp. 234–236 (Feb. 2016); DOI: 10.1145/2839509.2844672.

57. K. Nance and M. Bishop, "Introduction to HICCS-49 Digital Forensics — Education, Research and Practice Minitrack," *Proceedings of the 49th Hawaii International Conference on System Sciences* p. 5596 (Jan. 2016); DOI: 10.1109/HICSS.2016.692.

58. M. Bishop, K. Nance, and W. Claycomb, "Inside the Insider Threat (Introduction)," *Proceedings of the 49th Hawaii International Conference on System Sciences* p. 2728 (Jan. 2016); DOI: 10.1109/HICSS.2016.342.

2015

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60. S. Belcher, M. Bishop, M. Dark, and I. Ngambeki, "Teach the Hands, Train the Mind . . . A Secure Programming Clinic," *Proceedings of the 19th Colloquium on Information Systems Security Education* pp. 1–15 (June 2015); URI: https://cisse.info/archives/category/28-papers.

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2013

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15. M. Bentley, *The Viewport Technician: A Guide to Portable Software Design*, Scott, Foresman & Co. (1988)
    in *Computing Reviews* **30**(3) pp. 130–131 (Mar. 1989)

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    in *Computing Reviews* **29**(7) pp. 343-344 (July 1988)

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    in *Computing Reviews* **29**(5) p. 262 (May 1988)

18. K. Andreassen, *Computer Cryptology: Beyond Decoder Rings*, Prentice-Hall, Inc. (1987)
    in *Computing Reviews* **29**(3) p. 140 (Mar. 1988)

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20. L. F. Marshall and J. A. Anyanwu, "A Crash Resistent UNIX™ File System," *Software—Practise and Experience* **16**(2) pp. 107–118 (Feb. 1986)
    in *Computing Reviews* **27**(9) pp. 456–457 (Sep. 1986)

21. M. J. Rochkind, *Advanced UNIX™ Programming*, Prentice-Hall Inc. (1985)
    in *Computing Reviews* **27**(5) pp. 233–234 (May 1986)

22. T. Plum and J. Brodie, *Efficient C*, Plum Hall Inc. (1985)
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Software

1. *passwd+*, a set of programs to force users to select good password (see [211,217,218,225,230])
2. *lsu*, a set of programs to implement roles in a standard UNIX environment (see [232])
3. *binaudit*, a package to analyze files statically for alterations (see [238])
4. *deszip*, a set of programs and library routines to guess passwords rapidly (see [240])

Talks and Presentations

Keynote and Invited Addresses

- "Resilience and Security," 21st World Conference on Information Security Applications, Seoul, South Korea (Aug. 2020)
- "Is Practical Data Sanitization Possible?," CyberSecurity and Privacy Summer School, Stockholm, Sweden (June 2019)
- "Cybersecurity Curricular Guidelines 2017," Colloquium on Information Systems Security Education, New Orleans, LA (June 2018)
- "Some Ethics Puzzles," Colloquium on Information Systems Security Education, New Orleans, LA (June 2018)
- "CSEC 2017 Update: Joint Task Force on Cybersecurity Education," Cybersecurity Education Workshop, Lake Tahoe, CA (Apr. 2018)
- "A Brief, *Personal* History of Computer Security Education," Cybersecurity Education Workshop, Lake Tahoe, CA (Apr. 2018)
- "Education Interventions in the Context of 'Secure' Programming," Norwegian University of Science and Technology (Oct. 2017)
- "Secure Programming: A Way of Life (or Death)," SikkertNOK 2017 (Oct. 2017)
- "The NOT Top 10: Public Cybersecurity Trends Continue to Change" (with Bob Smock), State of California Cybersecurity Education Summit (Oct. 2017)
- "Effects of the Secure Programming Clinic (SPC) on Learners' Secure Programming Practices," Nelson Mandela University, Port Elizabeth, South Africa (Sep. 2017)
- "'Secure' Programming," North West University, Potchefstroom, South Africa (Sep. 2017)
- "Cybersecurity Curricular Guidelines," Colloquium for Information Systems Security Education (June 2017)
- "Secure Programming: A Way of Life (or Death)," Colloquium for Information Systems Security Education (June 2017)
- "Resilience and Security," International Conference on Cyber Warfare and Security, Dayton, OH (Mar. 2017)
- "Why Can't We Do Security Right?," Socio-Technical Aspects in Security and Trust Workshop, Los Angeles, CA (Dec. 2016)
- "Resilience and Security," Resilience Models and Measures track, Resilience Week, Chicago, IL (Feb. 2016)
- "Insider Problem and Elections," Center for Applied Cybersecurity Research, Indiana University, Bloomington, IN (Feb. 2016)
- "Insider Problem and Elections," TRESPASS, Technical University of Denmark, Copenhagen, Denmark (Jan. 2016)
- "Research Challenges for Electronic Voting: E-Voting and Assurance," US/Brazil Workshop on Cyber Security and Privacy, Brasilia, Brazil (Dec. 2015)
- "Characterizing the Insider Problem," Workshop on Managing Insider Security Threats, Seoul, South Korea (Nov. 2014)
- "An Analysis of the Buffer Overflow Problem," California State University Sacramento, Sacramento, CA (Oct. 2014)
- "Testing the Resistance of Pervasive Technologies to Attack," Seventh International Conference on Pervasive Technologies Related to Assistive Environments, Rhodes, Greece (June 2014)
- "An Analysis of the Buffer Overflow Problem," Symposium on Information Security and Computer Systems, Manaus, Brazil (Nov. 2014)
- "'Secure' Programming," Security & Privacy Symposium 2013, Kanpur, India (Feb. 2013)
- "The Insider Problem, Inside Out," The 7th International Workshop on Security, Fukuoka, Japan (Nov. 2012)
- "Learning and Experience in Computer Security Education," XII Reunión Española sobre

Criptología y Seguridad de la Información, San Sebastián, Spain (Sep. 2012)

- "Computers and Elections: The Good, the Bad, and the Ugly," Oregon Security Day, Eugene, OR (Apr. 2012)
- "Electronic Voting Systems: Problems, Questions, and Answers," E-Voting in Bangladesh, Dhaka, Bangladesh (Mar. 2012)
- "Vulnerabilities in Cryptography for the Future," Standing Committee for Technology Insight–Gauge, Evaluate, and Review, National Research Council, Charlottesville, VA (Aug. 2011)
- "Teaching Secure Programming," Summit on Education in Secure Software, Washington DC (Oct. 2010)
- "Computer Security in the Future," ISCISC 2010 Conference, Tehran, Iran (Sep. 2010)
- "Reflections on UNIX Vulnerabilities," 25th Annual Computer Security Applications Conference, Honolulu, HI (Dec. 2009)
- "Analyzing Security in Pervasive Assistive Environments," Second International Conference on Pervasive Technologies Related to Assistive Environments (June 2009)
- "The SANS/CWE Top 25 Checklist: Friend or Foe?" CISO Lecture Series, The California Office of Information Security and Privacy Protection, Sacramento, CA (Feb. 2009)
- "Pervasive Technology and Pervasive Security," First International Conference on Pervasive Technologies Related to Assistive Environments (July 2008)
- "How to Evaluate the Security of New Technology," Institute of Internal Auditors' International Conference, San Francisco (July 2008)
- "Computers and Elections: The Good, the Bad, and the Ugly," Sun Security Ambassador Day, Santa Clara, CA (Apr. 2008)
- "Framework for Data Anonymization," First International Symposium on Global Information Governance 2008, Pisa, Italy (Mar. 2008)
- "Securing the Internet Infrastructure: *Huh?*" University of Colorado at Colorado Springs Security Forum, Colorado Springs, CO (Mar. 2007)
- "Teaching Assurance Using Checklists", Sixth Workshop on Education in Computer Security (*WECS 6*), Naval Postgraduate School, Monterey, CA (Jan. 2006)
- "Threats and Assurance", Information Technology Workshop, Department of Health and Human Services, State of California, Rancho Cordova, CA (Nov. 2003)
- "E-Business Security: Fact, Fiction, or Both?", Information System Security Association Conference, Sacramento Chapter, Sacramento, CA (2001)
- "Academia and Education in Information Security: Four Years Later", National Colloquium on INFOSEC System Security Education, Washington, DC (2001)
- "The State of INFOSEC Education in Academia: Present and Future Directions", National Colloquium on INFOSEC System Security Education, Bethesda, MD (1997)

Selected Talks Not Associated With Published Papers

- "Computers and Elections: The Good, the Bad, and the Ugly," Federal Bureau of Investigation, Los Angeles, CA (Apr. 2020)
- "Elections, Voting, Computers and All That," League of Women Voters, Seattle, WA (Mar. 2018)
- "The Insider Threat and Response," University of California Security Symposium, Berkeley, CA (Nov. 2016)
- "Faculty and Security," panel presentation for CENIC Annual Conference, Davis, CA (Mar. 2016)
- "How I Learned to Teach Programming—And Other Misadventures," University of Houston, Houston, TX (Mar. 2015)
- "Is Practical Data Sanitization Possible?," Discovery 2020, Lawrence Berkeley National Laboratory, Berkeley, CA (June 2014)
- "Is Practical Data Sanitization Possible?," Amazon ZonCon Conference, Seattle, WA (Mar. 2014)

- "Robust Programming," University of California Computer Security Conference, Davis, CA (June 2013).
- "Secure Programming: A Way of Life (or Death)," SANS Application Security Conference, Las Vegas, NV (Apr. 2012)
- "The Threat of the Insider Threat," CA Labs, Santa Clara, CA (Oct. 2011)
- "Summit on Education in Secure Software: Summary Findings," Workshop on Shaping the Future of Cybersecurity Education, Gaithersburg, MD (Sep. 2011)
- "Multistage Malware: Delivery and Execution," University of California Computer Security Conference, Davis, CA (June 2011)
- "Robust Programming," University of California Computer Security Conference, Davis, CA (June 2011)
- "The Insider Problem, Inside Out," Dept. of Computer Science, Florida Institute of Technology, Melbourne, FL (Feb. 2011)
- "Computers and Elections: The Good, the Bad, and the Ugly," Dept. of Computer Science, Florida Institute of Technology, Melbourne, FL (Feb. 2011)
- "Data Sanitization for Fun and Aggravation," Booz Allen Hamilton, Vienna, VA (Sep. 2009)
- "The Insider Problem Inside Out," Dept. of Computer Science, Carleton University, Ottowa, Canada (Apr. 2009)
- "Report on the Workshop on GENI and Security; or, What Happens When the GENI Leaves the Bottle?" GENI Engineering Conference, Miami, FL (Mar. 2009)
- "The Insider Problem, Inside Out," Dept. of Computer Science, University of Alaska Fairbanks, Fairbanks, AK (Sep. 2008)
- "Defining the Insider Threat" (with S. Engle, S. Peisert, S. Whalen, and C. Gates), Countering Insider Threats, Dagstühl, Germany (June 2008)
- "Elections and Computers: What's Going On?," University of California Computer Security Conference, Davis, CA (June 2007)
- "What Are the Issues We Want to See Funded?", Pacific Northwest National Laboratory, Richland, WA (Feb. 2007)
- "Elections and Computers: A Match Made in . . . Someplace?", Naval Postgraduate School, Monterey, CA (Nov. 2006)
- "GENI and Security" (with D. Frincke, C.-N. Chuah, and K. Levitt), *GENI Town Hall Meeting*, San Francisco, CA (July 2006)
- "E-Voting Machines: Measuring What?", *Threat Analyses for Voting System Categories: A Workshop on Rating Voting Methods* (*VSWR 2006*), George Washington University, Washington DC, USA (June 2006)
- "Principles and their Use", *Common Body of Knowledge for Software Assurance Workshop*, Monterey, CA (Feb. 2006)
- "Teaching Assurance Using Checklists", *Seventh Workshop on Education in Computer Security* (*WECS 6*), Naval Postgraduate School, Monterey, CA (Jan. 2006)
- "Security and Standards; Or, What Should This System Do and How Well Does It Do That", *California E-Recording Summit: Implementing the Electronic Recording Delivery Act*, Sacramento, CA (Feb. 2006)
- "A Survey of Vulnerabilities", NASA Jet Propulsion Laboratory (Mar. 2004)
- "Vulnerabilities Analysis", Dept. of Computer Science, Naval Postgraduate School (Dec. 2003)
- "Threats and Assurance", Dept. of Health and Human Services, State of California (Nov. 2003)
- "Vulnerabilities Analysis", Dept. of Computer Science, University of Maryland/Baltimore County (Sep. 2003)
- "Vulnerabilities Analysis", Dept. of Computer Science, Mississippi State University (Sep. 2003)
- "Auditing" and "Intrusion Detection" lectures for CS 526, Dept. of Computer Science and

CERIAS, Purdue University Summer Institute (July 2003)
- "Thoughts on a Research Agenda", panel presentation, *Colloquium on Information System Security Education* (June 2003)
- "A Survey of Vulnerabilities", IEEE/North American Taiwanese Engineers' Association (Apr. 2003)
- "Computer Security Education", INFOTEC (Apr. 2002)
- "Vulnerabilities and Sanitization", Georgia Institute of Technology (Nov. 2001)
- "Electronic Recordation and the Internet", panel presentation, *Real Estate Frauds Seminar*, California District Attorneys Association (2001)
- "Analysis of Computer Vulnerabilities", NASA Jet Propulsion Laboratory (2001)
- "Vulnerabilities Analysis", *SANS* (2001)
- "Security and Electronic Commerce", Student Management Group, Krannert School of Management, University of California at Davis (2001)
- "Trust and Security", Linux Users' Group of Davis (2001)
- "Go Port-Scan Yourself", *Information Security Awareness Forum*, Department of Information Technology, State of California (2000)
- "Adapting Formal Methods for Informal Use", *SANS Network Security* (2000)
- "ECS 153, Introduction to Computer Security", panel presentation, *National Colloquium on Information System Security Education* (1999)
- "Research in Intrusion Detection", *I4 Conference* (1999)
- "Results from Workshops on Intrusion Detection" (with S. Northcutt), *Network Security Conference* (1998)
- "Unlearned Lessons", panel presentation, *21st National Information Systems Security Conference* (1998)
- "The UC Davis Vulnerabilities Database", *SANS Conference* (1998)
- "Attacking the Internet Infrastructure", *SEARCH Conference* (1997)
- "Writing Safe Privileged Programs", *Network Security Conference* (1997)
- "UNIX Security", *SHARE Conference* (1997)
- "Teaching Computer Security", *ACM Workshop on Computer Security Education* (1997)
- "Adventures in Hackery", *System Administration, Networking and Security Conference* (1996)
- "Top Ten Security Threats to a UNIX System and What to Do About Them", *SHARE 86* (1996); ***Best Session Award***
- "Patch-and-Catch", *UNIFORUM 1996* (1996)
- "Research, Development, and Operations", *Defensive Information Warfare Symposium* (1995)
- "Intruders and UNIX", *Network Security* (1995)
- "An Overview of Computer Viruses in a Research Environment", *Fourth Annual Computer Virus and Security Conference* (1991)
- "Password Management", *COMPCON '91* (1991)
- "A Security Analysis of the NTP Protocol", *Sixth Annual Computer Security Conference Proceedings* (1990)
- "Password Checking Techniques", *Second Invitational Workshop on Computer Security Incident Response* (1990)
- "Privacy-Enhanced Electronic Mail", *Student ACM Chapter, St. Michael's College* (1989)
- "Selling C Shells By the C Shore", *IRIS Users' Group, NASA Ames Research Center* (1985)
- "A Day in the Life of a UNIX User", *15th Virginia Computer Users' Conference* (1985)

Grants and Contracts

Ongoing

1. May 2020–*current*: *Collaborative Research: SaTC: EDU: Collaborative: Building an Electronic Voting Technology Inspired Interactive Teaching and Learning Framework for Cybersecurity Education*, National Science Foundation, $170,000 [PI]

2. Jan. 2020–*current*: *Intrusion Detection and Deception for Industrial Control Systems*, Sandia National Laboratory, $25,000 [PI]

3. Oct. 2019–*current*: *Data Anonymization and Data Analysis in the Field of Transportation: Discovering the Gaps*, University of California Institute of Transportation Studies SB 1 (Public Transportation Account and the Road Repair and Accountability Act of 2017) Research Program, $22,579 [PI]

4. Oct. 2019–*current*: *SaTC: EDU: Collaborative: An Assessment Driven Approach to Self-Directed Learning in Secure Programming (SecTutor)*, National Science Foundation, $151,008 [PI]

5. June 2017–*current*: *CICI: CE: Improving the Security of a Science DMZ*, National Science Foundation, $738,094 [co-PI with Prof. Dipak Ghosal and Vice-Provost of Information and Education Technology Viji Murali of the University of California at Davis]

6. Aug. 2014–*current*: *Introductory Exercises for Computer Security*, gift from Intel Corp., $24,910 [PI]

Completed

7. Mar. 2019–June 2020: *Computers and Networks for Cybersecurity Experiments and Education*, Department of the Army Research Laboratory, $200,000 [PI]

8. Oct. 2017–Sep. 2019: *Developing a Secure Programming Concept Inventory*, National Security Agency via Purdue University, $74,999 [PI]

9. Aug. 2017–Aug. 2019: *Dynamic Adversary Modeling and Experimentation (DAME)*, Air Force Research Laboratory via BBN Raytheon, $215,699 [PI]

10. July 2017–Sep. 2018: *Modeling the Insider Threat*, Davis Division of the Academic Senate, University of California, $24,945 [PI]

11. July 2013–June 2017: *Modeling the Process of Internet Voting*, National Institute for Standards and Technology, $228,000 [co-PI with Prof. Leon Osterweil, Prof. Lori Clarke, and Prof. George Avrunin of the University of Massachusetts Amherst]

12. June 2017–Sep. 2018: *Modeling the Insider Threat*, University of California Davis Division of the Academic Senate, $24,945 [PI]

13. Aug. 2014–June 2020: *Collaborative: Development and Testing of a Secure Programming Clinic*, National Science Foundation, $482,683 [PI]

14. July 2013–June 2015: *INSuRE EAGER*, National Science Foundation, $88,000 [co-PI with Prof. Melissa Dark of Purdue University (PI); Prof. Brandeis Marshall of Purdue University; Prof. Thomas Morris of Mississippi State University; and Prof. Alan Sherman of the University of Maryland Baltimore County]

15. Jan. 2013–Dec. 2015: *CC-NIE Integration: Improved Infrastructure for Data Movement and Monitoring*, National Science Foundation, $992,746 [co-PI with Vice-Provost of Information and Education Technology P. Siegel of the University of California at Davis]

16. Sep. 2012–Aug. 2014: *EAGER: Collaborative: Process-Based Technology to Support Comparison and Evaluation of the Security of Elections*, National Science Foundation, $75,000 [co-PI with Prof. L. Osterweil and Prof. L. Clarke of the University of Massachusetts at Amherst]

17. Aug. 2012–Aug. 2013: *GOALI: TC: Medium: Collaborative Research: Technological Support for Improving Election Processes (Graduate Student Industry Fellowship/Traineeship) (supplemental)*, National Science Foundation, $33,505 [PI]

18. Aug. 2012–Aug. 2013: *GOALI: TC: Medium: Collaborative Research: Technological Support for Improving Election Processes (Faculty-in-Industry) (supplemental)*, National Science Foundation, $56,466 [PI]

19. July 2010–June 2013: *Auditing Voting Systems While Preserving Secrecy and Anonymity*, National Science Foundation, $90,000 [co-PI with Dr. S. Peisert of Lawrence Berkeley National Laboratory and the University of California at Davis]

20. May 2010–May 2013: *Summit on Education in Secure Software*, National Science Foundation (subcontract from George Washington University, $36,098 [co-PI with Prof. Diana Burley of

George Washington University]

21. Oct. 2009–June 2013: *Attribution for GENI*, GENI Projects Office, $145,000 [co-PI with Dr. Jeffrey Hunker of Jeffrey Hunker Associates LLC and Dr. Carrie Gates of CA Labs, Inc.]

22. Sep. 2010–Dec. 2011: *Basic Proposal for Information Assurance Scholarship Program*, National Security Agency, $63,359 [PI]

23. Dec. 2009–May 2010: *Data Sanitization and Analysis*, Institute for Information Infrastructure Protection, $80,000 [PI]

24. Oct. 2009–Sep. 2012: *A Mathematical and Data-Driven Approach to Intrusion Detection for High-Performance Computing*, U.S. Department of Energy, $750,000 [co-PI with Dr. D. Bailey of Lawrence Berkeley National Laboratory and Dr. S. Peisert of Lawrence Berkeley National Laboratory and the University of California at Davis]

25. Sep. 2009–Aug. 2013: *TC: Medium: Collaborative Research: Technological Support for Improving Election Processes*, National Science Foundation, $449,999 [co-PI with Prof. L. Osterweil and Prof. L. Clarke of the University of Massachusetts at Amherst]

26. Aug. 2009–Aug. 2010: *Basic Proposal for Information Assurance Scholarship Program*, National Security Agency, $55,614 [PI]

27. Apr. 2009–Dec. 2009: *Emerging Research in Detecting Cyber Attacks*, Lockheed Martin Corp., $100,000 [PI]

28. Mar. 2009–Feb. 2010: *CT-M: Computer System Vulnerabilities and the Efficacy of Defensive Mechanisms*, National Science Foundation, $50,000 [co-PI with Prof. K. Marzullo of the University of California at San Diego and Dr. S. Peisert of Lawrence Berkeley National Laboratory and the University of California at Davis]

29. Aug. 2008–Aug. 2009: *Basic Proposal for Information Assurance Scholarship Program*, National Security Agency, $66,464 [PI]

30. June 2008–Aug. 2008: *Review of Electronic Voting Systems Certified in the State of California*, California Secretary of State, $450,921 [co-PI with Prof. D. Wagner of the University of California at Berkeley]

31. Sep. 2007–Aug. 2010: *CT-ISG: Collaborative Research: Detecting and Preventing Attacks in Recommendation Systems*, National Science Foundation, $228,374 [co-PI with Prof. F. Makedon of the University of Texas at Arlington]

32. Jan. 2007–Dec. 2009: *Planning Grant for Joining the NSF Center for Information Protection I/UCRC*, National Science Foundation, $10,000 [PI]

33. Aug. 2007–Aug. 2008: *Basic Proposal for Information Assurance Scholarship Program*, National Security Agency, $64,954 [PI]

34. Aug. 2006–Aug. 2007: *Basic Proposal for Information Assurance Scholarship Program*, National Security Agency, $48,746 [PI]

35. Aug. 2006–Aug. 2009: *Workshop: Security of the Cyber Infrastructure*, National Science Foundation, $70,001 [PI]

36. Aug. 2005–Aug. 2006: *Capacity Building: Secure Programming Clinic*, National Security Agency, $80,000 [PI]

37. Sep. 2003–Aug. 2006: *Data Management of Protected Information for Data Sharing and Collaboration*, National Science Foundation, $414,919 [co-PI with Prof. F. Makedon of Dartmouth College (PI) and Prof. A. Saykin, Dartmouth College (co-PI)]

38. Aug. 2003–Aug. 2006: *Vulnerabilities Analysis*, National Science Foundation, $240,000 [PI]

39. Aug. 2003–Aug. 2006: *Balancing Privacy and Analysis in Data Sanitization*, National Science Foundation, $220,000 [PI]

40. Feb. 2003–June 2004: *Security and Intra-Agency Recordation at the County Level*, Yolo County, $19,742 [PI]

41. Sep. 2002–Mar. 2004: *Denial of Service at the Data Link Layer*, UC Micro with Captus Networks, $31,308 [PI]

42. May 2001–Oct. 2005: *Intrusion Detection Analysis Project*, Promia, Inc., $289,000 [PI]

43. May 2000–Oct. 2005: *An Environment for Verifying Security Properties of Programs*, NASA Jet Pro- pulsion Laboratory, $354,000 [PI]

44. Oct. 1999–Sep. 2000: *Denial of Service in Windows Environments*, Microsoft Corp., $39,000 [PI]

45. Oct. 1998–Sep. 1999: *Denial of Service in the Infrastructure*, NASA Ames Research Center, $97,250 [PI]

46. Sep. 1997–Sep. 2000: *Computer Vulnerabilities and Policy-Based Security*, Intel Corp., $225,000 [co-PI with Prof. K. Levitt and C. Wee of the University of California at Davis]

47. Jan. 1997–June 1997: *Program and System Vulnerabilities*, Trident Data Systems, Inc., $50,000 [PI]

48. Sep. 1996–Aug. 1997: *Testing Security Properties of Protocols and Their Implementations*, National Security Agency, $96,312 [PI]

49. July 1996–Oct. 1996: *Detection of Vulnerabilities*, SRI International, $16,568 [PI]

50. Aug. 1994–June 1996: *Analysis of System Vulnerabilities*, Trident Data Systems, Inc., $228,000 [PI]

51. July 1994–Nov. 1995: *Distributed Auditing*, Lawrence Livermore National Laboratory, $98,000 [PI]

52. July 1994–June 1995: *Remote Tutor Project: UNIX-to-DOS Interface*, Office of the Provost, University of California at Davis, $6,700 [co-PI with Prof. R. Walters of the University of California at Davis]

53. June 1994–June 1995: Third Workshop on Future Directions in Computer Misuse and Anomaly Detection: *National Security Agencyand Air Force Information Warfare Center*, $77,000, Prof. K. Levitt, Prof. B. Mukherjee, and T. Heberlein of the University of California at Davis [PI]

54. Sep. 1993–Sep. 1997: *Towards a Tester's Assistant for Property-Based System Testing*, DARPA/ONR, $195,000 [co-PI with Prof. K. Levitt and Prof. R. Olsson of the University of California at Davis]

55. Sep. 1993–Mar. 1994: *Adding Mutual Authentication to DIDS*, Trident Data Systems, Inc., $46,323 [PI]

56. June 1993–June 1994: *Second Workshop on Future Directions in Computer Misuse and Anomaly Detection*, National Security Agency, $60,000.00 [co-PI with Prof. K. Levitt, Prof. B. Mukherjee, and T. Heberlein of the University of California at Davis]

57. July 1992–June 1993: *Formal Model of Security Monitoring*, National Security Agency, $58,502.00 [PI]

58. March 1992–April 1992: *Workshop on Future Directions in Computer Misuse and Anomaly Detection*, Lawrence Livermore National Laboratory and Los Alamos National Laboratory, $65,000.00 [co-PI with Prof. K. Levitt and Prof. B. Mukherjee of the University of California at Davis G. Liepens, H. Vaccaro, J. Prommel and S. Smaha of Los Alamos National Laboratory, and D. Mansur of Lawrence Livermore National Laboratory]

59. October 1989–September 1992: *UNIX^{TM} Password Security and Distributed Computation*, NASA Ames Research Center, $121,365.00 [PI]

60. June 1989–August 1989: *Analyzing the UNIX^{TM} Password Algorithm*, NECUSE, $2,500 [PI]

61. September 1987–August 1989: *A Network System Administration System*, NASA Ames Research Center, $35, 807 [PI]

62. July 1987–June 1990: *Applications of the Take-Grant Model and Authentication in Computer Systems*, Burke Research Initiation Award, Dartmouth College, $14,775 [PI]

Professional Service
Editorial Boards

- *Computers & Security* (2020–*current*)

- *IEEE Privacy and Security*; also co-editor of the Education Department, with Dr. Deborah Frincke and Prof. Cynthia Irvine (2003–2011)
- *Journal of Computer Security* (1988–2010)

International Board of Reviewers

- *Computers & Security* (1993–2004)

Advisory Boards

- Johns Hopkins University, Whiting School of Engineering, Engineering for Professionals CS, IA, and ISE Programs (2013–2018)
- AlienVault Technical Advisory Board (2012–2018)
- *The ISC International Journal of Information Security* (2009–*current*)
- Electronic Recording Delivery System (ERDS) Advisory Committee, Office of the Attorney General, State of California (2008–*current*)
- Fortify Software Technical Advisory Board (2002–2011)

Working Groups

- Secretariat, IFIP Technical Committee 11, Working Group 8 — Computer Security Education (2015–*current*)
- NIST-EAC Public Working Groups, CyberSecurity Working Group (2016–2018)
- ACM/IEEE Computer Society/AIS SIGSEC/IFIP TC11 WG11.8 Joint Task Force on Cybersecurity Education; co-chair (2015–2018)
- UC Davis Computer Security Laboratory representative to the Institute for Information Infrastructure Protection (I3P) (2002–*current*; member, Executive Committee 2009–2011, 2013–*current*; vice chair, 2010)
- Responsible Disclosure Task Force, National Infrastructure Assurance Council (2003)
- Distributed Systems Advisory Board (1986–1988)
- Privacy and Security Research Group, Internet Research Task Force (1985–1997)

Other

- Senior Member, Applied Computer Security Associates (2014–*current*)
- California Cybersecurity Workforce Development and Education; member, Objective 2.3 (Undergraduate/Graduate State and Private Schools) working group (2014–*current*)
- Member, Committee on Professionalizing the Nation's Cybersecurity Workforce: Criteria for Future Decision-Making, National Research Council (2012–2013)
- NSF Secure and Trustworthy Computing PI Meeting; steering committee (2012)

Program Chairs and Committees

- 53rd Hawaii International Conference on System Science; insider mini track co-chair (2020)
- 2019 Workshop on Cyber Security Experimentation and Test; program committee (2019)
- 12th World Information Security Education Conference (WISE 2019); program committee (2019)
- 52nd Hawaii International Conference on System Science; insider mini track co-chair (2019)
- Secure Coding Workshop; co-organizer (2018)
- 2018 New Security Paradigms Workshop (NSPW2018); general chair (2018)
- 11th World Information Security Education Conference (WISE 2018); program committee (2018)
- 10th Annual National Cyber Security Summit (NCS 2018); program committee (2018)
- 2018 European Conference on Cyber Warfare and Security (ECCWS 2018); program committee (2018)
- 2018 Workshop on Research in Insider Threat (WRIT 2018); program committee (2018)

- 51st Hawaii International Conference on System Science; insider mini track co-chair (2018)
- 2018 Workshop on Usable Security (USEC 2018); program committee (2017–2018)
- 2017 Socio-Technical Aspects in Security and Trust Workshop (STAST 2017); program committee (2017)
- 2017 New Security Paradigms Workshop (NSPW2017); vice chair (2017)
- 9th Annual National Cyber Security Summit (NCS 2017); program committee (2017)
- 10th World Information Security Education Conference; program co-chair (2017)
- 32nd International Conference on ICT Systems Security and Privacy Protection (IFIP SEC 2017); program committee (2017)
- IEEE BigData Service 2017; program committee (2017)
- 50th Hawaii International Conference on System Science; digital forensics mini track co-chair, insider mini track co-chair (2017)
- Third IEEE International Conference on Big Data Service Computing Service and Applications; program committee (2016-2017)
- 32nd Annual Computer Security Applications Conference; program committee (2016)
- Eighth ACM CCS International Workshop on Managing Insider Security Threats (MIST 2016); program committee (2016)
- African Cyber Citizenship Conference 2016 (ACCC2016); program committee (2016)
- IEEE Workshop on Cybersecurity Education and Workforce (CEW 2016); program committee (2016)
- Ninth International Conference on Trust & Trustworthy Computing (TRUST 2016); program committee (2016)
- 2016 USENIX Workshop on Advances in Security Education (ASE 2016); program committee (2016)
- 2016 New Security Paradigms Workshop (NSPW 2016); program committee (2016)
- First International Workshop on Education for Secure Digital Information Processing, Data Mining and Wireless Communications (ESDIPDMWC 2016); program committee (2016)
- 2016 National Cyber Summit (2016); program committee (2016)
- 2016 Workshop on Learning from Authoritative Security Experiment Results (LASER 2016); program committee (2016)
- Ninth World Information Security Education Conference; program co-chair (2016)
- 31st IFIP TC-11 SEC 2016 International Information Security and Privacy Conference; program committee (2016)
- 2016 Workshop on Research in Insider Threats (WRIT 2016); program committee (2016)
- 49th Hawaii International Conference on System Science; digital forensics mini track co-chair, insider track co-chair (2016)
- 31st Annual Computer Security Applications Conference; program committee (2015)
- 2015 Workshop on Managing Insider Security Threats; program committee (2015)
- Second ACM Workshop on Information Sharing and Collaborative Security; program committee (2015)
- Fifth International Workshop on Socio-Technical Aspects in Security and Trust; program committee (2015)
- 2015 Workshop on Cyber Security Experimentation and Test; program committee (2015)
- 2015 New Security Paradigms Workshop; program committee, financial aid co-chair, steering committee (2015)
- 19th Colloquium on Information System Security Education; program committee (2015)
- Eighth International Conference on Pervasive Technologies Related to Assistive Environments; program committee (2015)
- Fifth International Workshop on Information Systems Security Engineering; program committee (2015)
- 14th European Conference on Information Warfare and Security; program committee (2015)

- Ninth World Conference on Information Security Education; program committee, program co-chair (2015)
- 2015 International Conference on ICT Systems Security and Privacy Protection; program committee (2015)
- First IEEE International Conference on Big Data Service Computing Service and Applications; program committee (2014–2015)
- First ACM Workshop on Information Sharing and Collaborative Security; program committee (2014)
- 2014 New Security Paradigms Workshop; financial aid co-chair, steering committee (2014)
- 2014 Learning from Authoritative Security Experiment Results; program committee (2014)
- 48th Hawaii International Conference on System Science; digital forensics mini track co-chair (2015)
- First African Cyber Citizenship Conference; program committee (2014)
- 2014 Workshop on Cyber Security Experimentation and Test; program committee (2014)
- Fourth International Workshop on Socio-Technical Aspects in Security and Trust; program committee (2014)
- 12th International Conference on Privacy, Security, and Trust; program committee (2014)
- 18th Colloquium on Information System Security Education; program committee (2014)
- Seventh International Conference on Pervasive Technologies Related to Assistive Environments; program committee (2014)
- 2014 Workshop on Research for Insider Threat; program committee (2014)
- 12th International Conference on Practical Applications of Agents and Multi-Agent Systems; program committee (2014)
- 2014 Workshop on Graphical Models for Security; program committee (2014)
- 47th Hawaii International Conference on System Science; digital forensics mini track co-chair (2014)
- 2013 New Security Paradigms Workshop; financial aid co-chair, steering committee (2013)
- 2013 Learning from Authoritative Security Experiment Results; program committee (2013)
- 2013 IEEE Technologies for Homeland Security (Cyber Security track); program committee (2013)
- 2013 ACM Computer and Communication Security Conference; program committee (2013)
- Third International Workshop on Socio-Technical Aspects in Security and Trust; program committee (2013)
- Eleventh Annual International Conference on Privacy, Security, and Trust; program committee (2013)
- Eighth World Conference on Information Security Education; program committee (2013)
- Sixth International Conference on Pervasive Technologies Related to Assistive Environments; program committee (2013)
- 2013 Workshop on Research for Insider Threats; program committee (2013)
- 2013 European Conference on Information Warfare; program committee (2013)
- 46th Hawaii International Conference on System Science; program committee, digital forensics mini track co-chair (2013)
- 2012 New Security Paradigms Workshop; financial aid co-chair, program committee, steering committee (2012)
- 2012 IEEE Technologies for Homeland Security (Cyber Security track); program committee (2012)
- Second International Workshop on Socio-Technical Aspects in Security and Trust; program committee (2012)
- Fifth Workshop on Cyber Security Experimentation and Test; program committee (2012)
- 2012 Learning from Authoritative Security Experiment Results; organizing committee, program co-chair (2012)

- First Moving Target Defense Research Symposium; program committee (2012)
- 11th European Conference on Information Warfare and Security; session chair (2012)
- 2012 Colloquium on Information System Security Education; program committee (2012)
- First International Workshop on Information Systems Security Engineering (2012)
- 2012 Digital Forensics Conference; program committee (2012)
- 2012 Usable Security Workshop; program committee (2011–2012)
- 45th Hawaii International Conference on System Science; digital forensics mini track co-chair (2012)
- 2011 Workshop on Governance of Technology, Information, and Policies; program committee (2011)
- 2011 NDSS Symposium; program committee (2011)
- 27th Annual Computer Security Applications Conference; program committee (2011)
- 2011 Cyber Security Experimentation and Test; program committee (2011)
- 2011 New Security Paradigms Workshop; program committee, financial aid co-chair (2011)
- Fifteenth Colloquium on Information Systems Security Education; program committee (2011)
- Eleventh Annual Digital Forensics Research Conference; program committee (2011)
- Seventh World Conference on Information Security Education; program committee (2011)
- Workshop on Governance of Technology, Information, and Policy; chair, program committee (2010)
- Summit on Education in Secure Software; co-chair (2010)
- Second International Symposium on Global Information Governance; program co-chair (2009)
- Workshop on GENI and Security; chair, program co-chair (2009)
- Colloquium for Information System Security Education; program committee (2003–2007)
- Information Security Workshop; program committee (2007)
- International Workshop on Systematic Approaches to Digital Forensic Engineering; program committee (2007)
- Secure Knowledge Management Workshop; program committee (2006)
- New Security Paradigms Workshop; program committee (2006–2007); general co-chair (2007); general chair (2008); financial aid co-chair (2009–*current*)
- Annual Conference on Education in Information Security (2006–2007)
- International Conference on Security and Privacy in Communication Networks (SecureComm); program committee (2006–2007)
- Workshop on Secure Software Engineering Education and Training; program co-chair (2006)
- IEEE International Symposium on Secure Software Engineering; program committee (2006)
- Fourth World Conference on Information Security Education; program committee (2005)
- IEEE International Workshop on Enabling Technologies: Infrastructure for Collaborative Enterprises (WETICE); program co-chair (2005?2007); program committee (2004–2007)
- Annual Computer Security Applications Conferences, student awards chair (1996–2000); program committee (1990, 1996–2000)
- Symposium on Networked and Distributed System Security, program co-chair (1997–1998); program committee (1996–2000)
- Workshop on Computer Misuse and Anomaly Detection, workshop chair (1995); program committee (1993–1994)
- Winter 1993 USENIX Technical Conference (1993)
- CERT Workshop on Research in Incident Handling, working group chair for "Medium Term Issues in Incident Handling: Tools and Techniques" group (1992)
- Workshop on Foundations in Computer Security II; session chair, program committee (1992)
- Third USENIX UNIX Security Symposium; program committee (1992)
- Dartmouth Summer Institute on Issues and Obstacles in the Practical Implementation of Parallel Algorithms and the Use of Parallel Machines; co-organizer (1991)
- UNIX Security Workshop, workshop chair (1988, 1990)

- UNIX Security Workshop, workshop chair (1988)

Reviewer for Journals

- *ACM Computing Reviews*
- *ACM Computing Surveys*
- *ACM Transactions on Programming Languages and Systems*
- *Communications of the ACM*
- *Computers and Security*
- *Information Processing Letters*
- *IEEE Computer*
- *IEEE Security and Privacy*
- *IEEE Software*
- *IEEE Transactions*
- *IEEE Transactions on Computers*
- *IEEE Transactions on Dependable and Secure Computing*
- *IEEE Transactions on Software Engineering*
- *International Journal of Information Security*
- *International Journal of Secure Software Engineering*
- *Journal of the ACM*
- *Journal of Computer Security*
- *Journal of Microprocessors and Microsystems*
- *Scientia Iranica*
- *Software—Practice and Experience*
- *South African IEEE Africa Research Journal*

Reviews for Funding Organizations

- National Research Foundation (South Africa)
- National Science Foundation
- Institute for Security Technology Studies, Dartmouth College

Other Reviews for Working Groups and Organizations

- *National Strategy for Critical Infrastructure Protection*, for the President's Critical Infrastructure Protection Board

Academic Service

University of California

University of California System Committees

- Member, University Committee on Academic Computing and Communications (2015–2017, 2018–*current*)

University of California at Davis Campus Committees

- Faculty Advisory Board, UC Extension (2017–*current*)
- CIO Strategic Advisory Council (member, 2016–*current*)
- Davis Division of the Academic Senate Committee on Information Technology (chair, 2015–2017, 2018–*current*; member, 2017–2018)
- Davis Division of the Academic Senate Committee on Elections, Rules, and Jurisdiction (member, 2014–2015)
- Advisory Board for Web Site Development Certificate Program at UC Extension (member, 1997–2002, 2013–2017)
- Campus Council for Information Technology (member, 2005–2006, 2007–2009, 2010–2015; chair 2010–2012)

- CCFIT Subcommittee on Research Support Services (chair, 2013–2014)
- CCFIT Wireless Task Group (chair, 2006–2007)
- CCFIT Wireless Working Group (chair, 2007–2009)
- Academic Senate Committee on Undergraduate Scholarships, Honors, and Prizes (member, 2012–2014)
- Big Data Committee (member, 2012–2013)
  - Infrastructure Subcommittee (chair, 2012–2013)
- Chief Information Security Officer, UC Davis, Search Committee (member, 2013)
- Telecommunications Advisory Board (chair, 2008–2009)
- Academic Senate Committee on Instruction (member, 2006–2009)
- Campus Judicial Board (member, 2006–2008)
- Academic Senate Undergraduate Council (member, 2005–2008)
- Academic Computing Coordinating Council Educational Computing Subcommittee (chair, 1999–2002)
- Instructional Space Advisory Group (member, 1999–2002)
- Academic Computing Coordinating Council (member, 1998–2002)
- Incident Response working group (member, 1998–2002)
- Core Team of the Learning Environment Architecture Development (LEAD) Project (member, 1998–2001)
- Minority Undergraduate Research Program in the Physical Sciences steering committee (member, 1998–2002)
- Academic Senate Undergraduate Preparatory Committee (member, 1994–1998)

College of Engineering

- Information Technology Shared Services Advisory Board (member, 2013–2019; chair, 2016–2018)
- Student Development and Welfare Committee (member, 2010–2011)

Department of Computer Science

- Information Technology Committee (1993–2009; chair 1994–1996, 1997–2009, chair 2013–*current*)
- Space Committee (member, 2013)
- Industrial Relations Committee (member, 2003–2004)
- Undergraduate Affairs Committee (member, 1997–1999)
- Faculty Recruiting Committee (member, 1996–1997)
- Industrial Affiliates Committee (member, 1993–1994)

Dartmouth College

Department of Computer Science

- Advisor to computer science majors (1992–1993)
- Undergraduate Education Program Committee (member, 1989–1993; chair 1992–1993)
- Graduate Admissions Committee (member, 1990–1991)
- Mellon Colloquium Committee (member, 1987–1989; chair 1988–1989)

Student Advising and Co-Advising

Ph.D. Dissertations

- Anhad Singh, University of California at Davis (2014)
  DISSERTATION TITLE: "An Iterative Approach to Examining the Effectiveness of Data Sanitization"
- Michael Clifford, University of California at Davis (2013)
  DISSERTATION TITLE: "The Solar Trust Model, Identity, and Anonymity"

- Sean Whalen, University of California at Davis (2010)
  DISSERTATION TITLE: "Security Applications of the ϵ-Machine"
- Sophie Engle, University of California at Davis (2010)
  DISSERTATION TITLE: "A Policy-Based Vulnerability Analysis Framework"
- Bhume Bhumiratana, University of California at Davis (2009)
  DISSERTATION TITLE: "Privacy Aware Micro Data Sanitization"
- S. Terry Brugger, University of California at Davis (2009)
  DISSERTATION TITLE: "The Quantitative Comparison of Computer Networks"
- Jingmin Zhou, University of California at Davis (2008)
  DISSERTATION TITLE: "Alert Reduction for Network Intrusion Detection"
- Sean Peisert, University of California at San Diego (2007)
  DISSERTATION TITLE: "A Model of Forensic Analysis Using Goal-Oriented Logging"
  Unofficial co-chair with Prof. Sidney Karin, Dept. of Computer Science, University of California at San Diego
- Thomas Walcott, University of California at Davis (2004)
  DISSERTATION TITLE: "Malfeasance: A Foundation for Traducement, Libel, Heresy, and Other Traditional Security Policies"
- Andrew Gross, University of California at San Diego (1997)
  DISSERTATION TITLE: "Analyzing Computer Intrusions"
  Co-chair with Prof. Réné Cruz, Dept. of Computer Science, University of California at San Diego
- George Fink, University of California at Davis (1996)
  DISSERTATION TITLE: "Discovering Security and Safety Flaws using Property-Based Testing"

M.S. Theses

- Ibrahim Ahmed, University of California at Davis (2018)
  THESIS TITLE: "A Method for Packet Correlation to Improve Snort Rules"
- Somdutta Bose, University of California at Davis (2017)
  THESIS TITLE: "Network Anonymization and Its Effect on Security Analysis"
- Daniel Chung, University of California at Davis (2015)
  THESIS TITLE: "Distributed Helios—Defending Online Voting"
- Arthur Arlt, University of Heidelberg (2014)
  THESIS TITLE: "Determining Rates of False Positives and Negatives in Fast Flux Botnet Detection"
  Second Supervisor; Chair, Prof. Michael Gertz, Institut für Informatik, Universität Heidelberg
- Bolun Zhao, University of California at Davis (2014)
  THESIS TITLE: "Formalization of Requirements for Online Healthcare Groups"
- Julia Ard, University of California at Davis (2012)
  THESIS TITLE: "Internet Protocol version Six (IPv6) at UC Davis: Traffic Analysis with a Security Perspective"
- William Orvis, University of California at Davis (2009)
  THESIS TITLE: "A Method for Automatically Generating Rules for a Requires-Provides Security Model of a System"
- Nina Gholami, University of California at Davis (2008)
  THESIS TITLE: "Detecting the TOCTOU Vulnerability: A Hybrid Approach"
- Elliot Proebstel, University of California at Davis (2007)
  THESIS TITLE: "Characterizing and Improving Distributed Network-based Intrusion Detection Systems (NIDS): Timestamp Synchronization and Sampled Traffic"
- Damien Howard, University of California at Davis (2007)
  THESIS TITLE: "Developing an Attack Tool Database"
- Lisa Clark, University of California at Davis (2007)
  THESIS TITLE: "Sanitizing Data to Prevent Disclosing Exact Network Topology"

- Patrick Wheeler, University of California at Davis (2006)
  THESIS TITLE: "Techniques for Improving the Performance of Signature-Based Network Intrusion Detection Systems"
- Adam Carlson, University of California at Davis (2006)
  THESIS TITLE: "The Unifying Policy Hierarchy Model"
- Thomas Ristenpart, University of California at Davis (2005)
  THESIS TITLE: "Time Stamp Synchronization of Distributed Sensor Logs: Impossibility Results and Approximation Algorithms"
- Deanna Rogers, University of California at Davis (2004)
  THESIS TITLE: "Using Deception to Enhance Anomaly Detection"
- Vincent Law, University of California at Davis (2003)
  THESIS TITLE: "Vulnerability Database Integration with Intrusion Detection Systems"
- Guillermo Marro, University of California at Davis (2003)
  THESIS TITLE: "Attacks at the Data Link Layer"
- David Peterson, University of California at Davis (2002)
  THESIS TITLE: "A Flexible Containment Mechanism for Executing Untrusted Code"
- Eric Haugh, University of California at Davis (2002)
  THESIS TITLE: "Testing C Programs for Buffer Overflow Vulnerabilities"
- Patrick LeBlanc, University of California at Davis (2002)
  THESIS TITLE: "A Property-Based Static Code Analysis"
- John Hughes, University of California at Davis (2000)
  THESIS TITLE: "Using Conservation of Flow as a Security Mechanism in Network Protocols"
- Peter Mell, University of California at Davis (1998)
  THESIS TITLE: "Automatic Policy Satisfaction and Verification for Intranet Wide Defense Systems using Signature-Based Intrusion Detection and Response Systems"
- Joel Dodson, University of California at Davis (1996)
  THESIS TITLE: "Specification and Classification of Generic Security Flaws for the Tester's Assistant Library"
- George Lin, University of California at Davis (1994)
  THESIS TITLE: "Counting Cleartext Passwords in the Internet"

Courses Taught

University of California at Davis

- ECS 293A, *Research in Computer Science*, graduate class
- ECS 289M, *Introduction to Research in Computer and Information Security*, graduate class
- ECS 289M, *Policy and Vulnerabilities Analysis*, graduate class
- ECS 253, *Cryptography and Data Security*, graduate class
- ECS 251/EEC 282, *Formal Models of Operating Systems*, graduate class
- ECS 235B, *Foundations of Computer and Information Security*, graduate class
- ECS 235A, *Computer and Information Security*, graduate class
- ECS 235, *Computer and Information Security*, graduate class
- ECS 155, *Computer Security for Non-Majors*, undergraduate class
- ECS 153, *Computer Security*, undergraduate class
- ECS 150, *Operating Systems*, undergraduate class
- ECS 50, *Introduction to Machine-Dependent Programming*, undergraduate class
- ECS 40, *Introduction to Software Development*, undergraduate class
- ECS 36A, *Introduction to Programming and Problem Solving*, undergraduate class
- ECS 30, *Introduction to Programming and Problem Solving*, undergraduate class
- ECS 15, *Introduction to Computers*, undergraduate class
- ECS 10, *Basic Concepts of Computing*, undergraduate class

- FRS 1, *E-Voting and Elections*, freshman seminar
- MHI 289I, *Programming for Health Informatics*, graduate class

Dartmouth College

- COSC 108, *Programming Languages and Systems II*, undergraduate class
- COSC 88/188, *Cryptography and Data Security*, undergraduate/graduate class
- COSC 88/188, *Computer System Security Seminar*, undergraduate/graduate class
- COSC 88/188, *Computer System Security*, undergraduate/graduate class
- COSC 85/185, *Mathematical Cryptography*, undergraduate/graduate class (co-taught with Prof. Jeff Shallitt)
- COSC 58, *Operating Systems*, undergraduate class
- COSC 37, *Computer Architecture*, undergraduate class
- COSC 23, *Software Engineering*, undergraduate class

Tutorials

1. *"Secure" Programming*: a week-long class presented to the Cybersecurity Education & Research Center, IIIT-Delhi and CISO Academy, New Delhi, India (remotely from Davis, CA) (Dec. 2014)
2. *"Secure" Programming*: presented at the Seventh International ISC Conference on Information Security and Cryptology 2010, held at Tehran, Iran, sponsored by the Iranian Society of Cryptology (Sep. 2010).
3. *"Secure" Programming*: presented at the Tenth National Computer and Information Security Conference, held at Bogata, Columbia, sponsored by the Colombian Society for Systems and Engineering (June 2010).
4. *A Short Course in Computer Security*: presented at the Summer Session for Korean Faculty, held at Seoul, South Korea, sponsored by the Advanced Institute of Information Technology (Aug. 2007).
5. *Basic UNIX Security* and *Advanced UNIX Security*: presented at the University of California Security Symposium, held at Davis, CA, sponsored by UC Davis Information and Educational Technology (June 2003).
6. *UNIX Security: Threats and Solutions*: presented at LISA, sponsored by the USENIX Association (Nov. 2002).
7. *UNIX Security: Threats and Solutions*: presented at the USENIX Security Symposium, sponsored by the USENIX Association (Aug. 2002).
8. *UNIX Security: Threats and Solutions*: presented at USENIX, sponsored by the USENIX Association (June 2002).
9. *How Attackers Break Programs, and How to Write Programs More Securely*: presented at SANS, sponsored by SANS (Apr. 2002).
10. *UNIX Security: Threats and Solutions*: presented at LISA, sponsored by the USENIX Association (Dec. 2001).
11. *Basic UNIX Protection*, *UNIX Security Tools*, and *How Attackers Break Programs, and How to Write Programs More Securely*: presented at SANS, sponsored by SANS (May 2001).
12. *Basic UNIX Protection*, *UNIX Security Tools*, and *How Attackers Break Programs, and How to Write Programs More Securely*: presented at Network Security, sponsored by SANS (Nov. 2000).
13. *How Attackers Break Programs, and How to Write Programs More Securely*: presented in conjunction with Infidel Corp. (Aug. 2000).
14. *UNIX Security Tools: Use and Comparison*: presented at GIAC, sponsored by SANS (July 2000).
15. *UNIX Security Tools: Use and Comparison*: presented at USENIX, sponsored by the USENIX Association (June 2000).

16. *Basic UNIX Protection*, *UNIX Security Tools*, and *How Attackers Break Programs, and How to Write Programs More Securely*: presented at SANS (May 2000).
17. *How Attackers Break Programs, and How to Write Programs More Securely*: presented in conjunction with ARCA Corporation (Mar. 2000).
18. *Basic UNIX Protection*, *UNIX Security Tools*, and *How Attackers Break Programs, and How to Write Programs More Securely*: presented at SANS Security, sponsored by SANS (Dec. 1999).
19. *UNIX Security Tools: Use and Comparison*: presented at LISA, sponsored by the USENIX Association (Dec. 1999).
20. *Basic UNIX Protection*, *UNIX Security Tools*, and *How Attackers Break Programs, and How to Write Programs More Securely*: presented at Network Security, sponsored by SANS (Nov. 1999).
21. *How Attackers Break Programs, and How to Write Programs More Securely*: presented at USENIX Security Symposium, sponsored by the USENIX Association (Aug. 1999).
22. *UNIX Security Tools*: presented at USENIX, sponsored by the USENIX Association (June 1999).
23. *Basic UNIX Protection*, *UNIX Security Tools*, and *How Attackers Break Programs, and How to Write Programs More Securely*: presented at SANS (May1999).
24. *Basic UNIX Protection*, *UNIX Security Tools*, and *How Attackers Break Programs, and How to Write Programs More Securely*: presented at SANS Intrusion Detection, sponsored by SANS (Feb. 1999).
25. *UNIX Security Tools*: presented at USENIX, sponsored by the USENIX Association (Dec. 1998).
26. *UNIX Security Tools*: presented at LISA, sponsored by the USENIX Association (Dec. 1998).
27. *UNIX Security: Threats and Solutions*, *Tools for UNIX Security*, *UNIX Security: Threats and Solutions from the Network*, and *UNIX Security: Security in Programming*: presented at Network Security, sponsored by SANS (Nov. 1998).
28. *UNIX Security: Threats and Solutions*, *Tools for UNIX Security*, *UNIX Security: Threats and Solutions from the Network*, and *UNIX Security: Security in Programming*: presented at SANS Australia, sponsored by SANS (June 1998).
29. *UNIX Security: Threats and Solutions*, *Tools for UNIX Security*, *UNIX Security: Threats and Solutions from the Network*, and *UNIX Security: Security in Programming*: presented at SANS, sponsored by SANS (May 1998).
30. *UNIX Security: Threats and Solutions*, *Wargames: Network Security*, and *UNIX Security Tools*: presented at Network Security, sponsored by SANS (Nov. 1997).
31. *UNIX Security: Threats and Solutions*, *Wargames: Network Security*, and *UNIX Security Tools*: presented at SANS, sponsored by SANS (May 1997).
32. *UNIX Security: Threats and Solutions* and *UNIX Security: Threats and Solutions from the Network*: presented in conjunction with Sequent Users' Group (Feb. 1997).
33. *UNIX Security Tools*: presented at USENIX, sponsored by the USENIX Association (Jan. 1997).
34. *Advanced Topics in UNIX Security*: presented at Sun Users' Group (Dec. 1996).
35. *UNIX Vulnerabilities and Security Toolkit*: presented in conjunction with Securities Industry Automation Corp. (Dec. 1996).
36. *UNIX Security: Threats and Solutions*, *Tools for UNIX Security*, *UNIX Security: Threats and Solutions from the Network*, and *UNIX Security: Security in Programming*: presented at Network Security, sponsored by SANS (May 1996).
37. *UNIX Security: Security in Programming*: presented in conjunction with Los Alamos National Laboratories (Aug. 1996).
38. *UNIX Security Tools*: presented at USENIX, sponsored by the USENIX Association (July 1996).

39. *Advanced Topics in UNIX Security*: presented at UNIFORUM (May 1996).
40. *UNIX Security: Threats and Solutions*, *Tools for UNIX Security*, *UNIX Security: Threats and Solutions from the Network*, and *UNIX Security: Security in Programming*: presented at SANS, sponsored by SANS (May 1996).
41. *Advanced Topics in UNIX Security*: presented at SHARE (Mar. 1996).
42. *Advanced Topics in UNIX Security* and *UNIX Security Tools*: presented at USENIX, sponsored by the USENIX Association (Jan. 1996).
43. *UNIX System Security* and *UNIX Security: Threats and Solutions from the Network*: presented at LISA, sponsored by the USENIX Association (Dec. 1995).
44. *UNIX Security: Threats and Solutions* and *UNIX Security Tools: Use and Comparison*: presented at Network Security, sponsored by SANS (Nov. 1995).
45. *UNIX Security: Threats and Solutions*, *Tools for UNIX Security*, *UNIX Security: Threats and Solutions from the Network*, and *UNIX Security: Security in Programming*: presented at SANS, sponsored by SANS (May 1995).
46. *Advanced Topics in UNIX Security*: presented at USENIX, sponsored by the USENIX Association (Dec. 1994).
47. *Basic UNIX Security*, *Advanced UNIX Security*, and *Tools for UNIX Security*: presented at FedUNIX (Dec. 1994).
48. *Advanced Topics in UNIX Security*: presented at USENIX, sponsored by the USENIX Association (June 1994).
49. *Basic UNIX Security*, *Advanced UNIX Security*, and *Tools for UNIX Security*: presented at FedUNIX (June 1994).
50. *UNIX Security: Threats and Solutions*, *UNIX Security: Threats and Solutions from the Network*, and *Writing Privileged Programs*: presented at SANS-III (Apr. 1994).
51. *Topics in UNIX Security*: presented at USENIX, sponsored by the USENIX Association (Jan. 1994).
52. *Introduction to UNIX Security*, *Advanced UNIX Security*, and *Tools for UNIX Security*: presented at FedUNIX (Dec. 1993).
53. *Advanced UNIX Security*: presented at CERT Workshop on Computer Security Incident Handling (Aug. 1993).
54. *Advanced UNIX Security*: presented at Sun Users' Group (June 1993).
55. *Introduction to UNIX Security* and *Advanced UNIX Security*: presented at SANS-II (Apr. 1993).
56. *Advanced UNIX Security*: presented at USENIX, sponsored by the USENIX Association (Jan. 1993).
57. *Introduction to UNIX Security* and *Advanced UNIX Security*: presented at FedUNIX (Dec. 1992).
58. *Advanced UNIX Security*: presented at Sun Users' Group (Dec. 1992).
59. *Introduction to UNIX Security* and *Advanced UNIX Security*: presented at World Conference on System Administration and Security (July 1992).
60. *Advanced UNIX Security*: presented at USENIX, sponsored by the USENIX Association (June 1992).
61. *Introduction to UNIX Security*: presented at USENIX, sponsored by the USENIX Association (Jan. 1992).
62. *Introduction to UNIX Security*, *Advanced UNIX Security*, and *Computer Viruses, Trojan Horses, and Logic Bombs*: presented at FedUNIX (Dec. 1991).
63. *Introduction to UNIX Security*: presented at EurOpen (Sep. 1991).
64. *Introduction to UNIX Security*: presented at USENIX, sponsored by the USENIX Association (June 1991).
65. *Introduction to UNIX Security*, *Introduction to Network Security*, and *Computer Viruses, Trojan Horses, and Logic Bombs*: presented at FedSecurity (June 1991).

66. *Introduction to UNIX Security*: presented at FedUNIX (Dec. 1990).

Honors

- Outstanding Teacher of the Year, College of Engineering, University of California at Davis (2015)
- Founder's Award, Colloquium for Information Systems Security (2009)
- Academia Award, Colloquium for Information Systems Security (2006)
- Best Paper Award (with L. Todd Heberlein), National Computer Security Conference; see [207] (1996)
- Regents' Scholar, University of California at Berkeley (1973–1976)

Personal

Programming Languages

APL, ASPOL, BASIC, C, C++, FORTRAN, LISP, PASCAL, Python, SNOBOL, Scheme; Assembly languages for LSI-11, PDP-11, PDP-10, DECSystem-2050, VAX-11, MC680x0, MIPS R4000; various domain-specific languages (*awk*, *sed*, *sh*, *etc.*); various markup languages and meta-languages (SGML, HTML, XML, *etc.*)

Personal Interests

Philately (especially US and UN stamps), history (particularly classical history and history of England in the reign of Henry VIII), foreign languages, literature, games