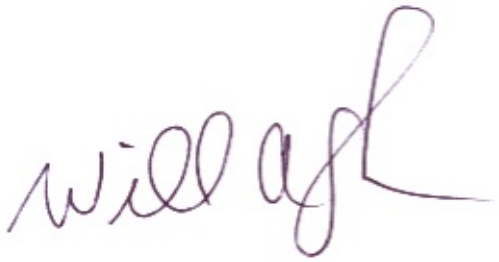
William A. Arbaugh

Notarization: I have read the following and certify that this curriculum vitae is a current and accurate statement of my professional record as of October 16, 2012.



Five Directions, Inc.
5520 Research Park Drive. Suite 100
Baltimore, MD 21228
E-mail: *waa@fivedirections.com*
http://www.cs.umd.edu/∼waa

Current Status

President and CTO
Five Directions, Inc.

Associate Professor Emeritus
Department of Computer Science and
University of Maryland Institute for Advanced Computer Studies
University of Maryland, College Park, Maryland.

Research Interests

Information Systems Security- focusing on wireless network security, embedded systems and active systems management.

Education

University of Pennsylvania. Philadelphia, Pennsylvania.
Advisors: Jonathan M. Smith and David J. Farber
Ph.D. in Computer Science, 1999.

Columbia University. New York, New York.
M.S. in Computer Science, 1985.

United States Military Academy. West Point, New York.
B.S. with a concentration in Computer Science, 1984.

Employment

President and CTO, Five Directions Leading an advanced research and development organization focusing information security for governments and commercial clients.

Associate Professor, Dept. of Computer Science, University of Maryland, College Park, Maryland.
July 2000–September 2012.
Responsible for establishing and managing a world class research program in Information Systems Security. Duties also include the design and teaching of an Information Systems Security curriculum. I've been exteremely successful in developing and transitioning research into practice. Semantic Integrity developed by myself and my students currently runs on every copy of Microsoft Windows. The technology from my PhD dissertation, secure boot with recovery, will be included in Microsoft's Windows 8, and secure boot with recovery is currently used in OSX and Apple's iOS. Finally, the Open1x open source platform is used in countless commercial access points.

As of the date of this CV, my *h-index* is 34, and I have 6,908 citations to my published work.

Principal Architect, Microsoft, Redmond, Washington.
March 2008–March 2009.

President and CTO, Komoku, Columbia, Maryland
November 2004–March 2008.
Komoku commercialized research developed by Professor Arbaugh and his students. Komoku was acquired by Microsoft in 2008. Komoku's technology currently runs on over 500 million hosts via incorporation into Windows Update and Microsoft's Security Essentials.

Senior Technical Advisor (Office of Advanced Network Programs), National Security Agency, Ft. Meade, Maryland.
1998–2000.
Senior Technical Advisor (Office of Advanced Network Programs) One of three senior technical advisors to the chief in an office of several hundred computer scientists, electrical engineers, and mathematicians. Duties included providing advice and guidance to the chief on emerging technologies, and for providing technical oversight on all projects within the office.

Senior Computer Scientist (Office of Research and Technology), National Security Agency, Ft. Meade, Maryland.
1990–1998.
Responsible for the initial development and execution of an internal applied computer security research program. Specific responsibilities included providing leadership and mentoring for several junior researchers, and establishing and justifying the goals and budget to senior management. Additional duties included leading an operational computer security evaluation team (Tiger Team) to perform vulnerability assessments. Examples of successful projects:

- Received the Louis W. Tordella award and the Science and Technology award for leading a team of seventeen mathematicians, computer scientists, and electrical engineers in transferring computer security research into internal operational use.
- Led a team of approximately twelve mathematicians and computer scientists that designed and implemented an Internet firewall with cryptographic support for remote authentication using PC cryptographic hardware tokens. The design, implementation, and

initial operating capability took place over a period of three months. The resulting implementation and design document served as the basis for the Defense Message System firewall design. Furthermore, the system remained operational for over two years until commercial firewalls could provide the same level of security.

Senior Software Engineer (Office of the Chief of Staff), U.S. Army, Alexandria, Virginia.
1987–1990.

Area Signal Node Platoon Leader (Second Infantry Division), U.S. Army, Republic of South Korea.
1986–1987.

Publications

Books

Jonathan Edney, and William A. Arbaugh, *Real 802.11 Security: WiFi-Protected Access and 802.11i*, Addison-Wesley, July 2003, ISBN 0-321-13620-9, 451 pages. (251 citations[1])

Book Chapters

D. S. Alexander, W. A. Arbaugh, A. D. Keromytis, and J. M. Smith, *Security in Active Networks*, ch. Mobile Code, pp. 433–451. No. 1603, Springer–Verlag, 1999.

Articles in Referred Journals

W. Arbaugh and D. A. Frincke, "Living with insecurity," *IEEE Security and Privacy*, vol. 9, pp. 12–13, 2011.

M. Shin and W. A. Arbaugh, "Efficient peer-to-peer lookup in multi-hop wireless networks," *TIIS*, vol. 3, no. 1, pp. 5–25, 2009.

A. Mishra, N. L. P. Jr., W. A. Arbaugh, and T. Fraser, "Security issues in ieee 802.11 wireless local area networks: a survey," *Wireless Communications and Mobile Computing*, vol. 4, no. 8, pp. 821–833, 2004.

Min-ho Shin, Justin Ma, Arunesh Mishra and William Arbaugh, "Wireless Network Security and Interworking," *To appear in the Proceedings of the IEEE*, 2005.

Arunesh Mishra, Nick L. Petroni, and William A. Arbaugh, "Security Issues in IEEE 802.11 Wireless Local-Area Networks: A Survey," *Wireless Communications and Mobile Computing Journal*, vol. 4, no. 8, pp. 821–833, 2004.

Arunesh Mishra, Min Ho Shin, Nick L. Petroni Jr., T. Charles Clancy, and William A. Arbaugh, "Proactive Key Distribution Using Neighbor Graphs," *IEEE Wireless Communications*, vol. 11, pp. 26–36, February 2004.

R. Housley and W. A. Arbaugh, "WLAN Problems and Solutions," *Communications of the ACM*, vol. 46, pp. 31 – 34, May 2003.

[1]Citation information is from Google Scholar.

A. Mishra, M. ho Shin, and W. A. Arbaugh, "An Analysis of the Layer 2 Handoff costs in Wireless Local Area Networks," *ACM Computer Communications Review*, vol. 33, no. 2, pp. 93 – 102, 2003.

Nick L. Petroni Jr. and William A. Arbaugh, "The Dangers of Mitigating Security Design Flaws: A Wireless Case Study," *IEEE Security and Privacy Magazine*, vol. 1, pp. 28 – 36, January/February 2003.

W. A. Arbaugh, N. Shankar, J. Wang, and K. Zhang, "Your 802.11 network has no clothes," *IEEE Wireless Communications Magazine*, vol. 9, pp. 44 – 51, December 2002.

D. S. Alexander, P. B. Menage, A. D. Keromytis, W. A. Arbaugh, K. G. Anagnostakis, and J. M. Smith, "The Price of Safety in an Active Network," *Journal of Communications and Networks (JCN), special issue on programmable switches and routers*, vol. 3, pp. 4 – 18, March 2001.

W. A. Arbaugh, W. L. Fithen, and J. McHugh, "Windows of Vulnerability: A Case Study Analysis," *IEEE Computer*, vol. 33, pp. 52–59, December 2000.

D. S. Alexander, W. A. Arbaugh, A. D. Keromytis, and J. M. Smith, "Secure Quality of Handling (SQoSH)," *IEEE Communications Magazine*, vol. 38, no. 4, pp. 106–112, 1999.

D. S. Alexander, W. A. Arbaugh, A. D. Keromytis, and J. M. Smith, "Safety and Security of Programmable Network Infrastructures," *IEEE Communications Magazine*, vol. 36, no. 10, pp. 84–92, 1998.

W. A. Arbaugh, J. R. Davin, D. J. Farber, and J. M. Smith, "Security for Virtual Private Intranets," *IEEE Computer*, pp. 48–55, September 1998.

D. S. Alexander, W. A. Arbaugh, M. Hicks, P. Kakkar, A. D. Keromytis, J. T. Moore, C. A. Gunter, S. M. Nettles, and J. M. Smith, "The SwitchWare Active Network Architecture," *IEEE Network Magazine*, vol. 12, no. 3, pp. 29–36, 1998.

D. S. Alexander, W. A. Arbaugh, A. D. Keromytis, and J. M. Smith, "A Secure Active Network Environment: Realization in Switchware," *IEEE Network Magazine*, vol. 12, no. 3, pp. 37–45, 1998.

Patents

Insun Lee, Kyung-Hun Jang, Min-Ho Shin, William Arbaugh, Arunesh Mishra, Patent #7,929,948 , April 19, 2011

Insun Lee, Sang-boh Yun, William Arbaugh, Charles Clancy, Min-ho Shin, Authentication method for wireless distributed system, Patent #7,756,510 , July 13, 2010

Arunesh Mishra, Min-ho Shin, William A. Arbaugh, Insun Lee, and Kyunghun Jang, *Method for Fast Roaming in a Wireless Network*, Patent #7,421,268, September 2008.

Arunesh Mishra, Min-ho Shin, William A. Arbaugh, Insun Lee, and Kyunghun Jang, *Probing Method for Fast Handoff in WLAN*, Patent #7,400,604, July 2008.

Arunesh Mishra, Min-ho Shin, William A. Arbaugh, Insun Lee, and Kyunghun Jang, *A Method for Fast Roaming in a Wireless Area Network*, Patent #7,263,357, August 2007.

Nick L. Petroni Jr., Timothy Fraser, Jesus Molina, and William A. Arbaugh, *A Method for Monitoring the Integrity of System Memory*, Patent filed, July 2004.

William A. Arbaugh, David J. Farber, and Jonathan M. Smith, *A Secure Bootstrap Process*, Patent #6,185,678, February 2001.

Referred Conferences and Workshops

T. Fraser, M. R. Evenson, and W. A. Arbaugh, "Vici virtual machine introspection for cognitive immunity," in *ACSAC*, pp. 87–96, IEEE Computer Society, 2008.

B. Xiao, L. T. Yang, J. Ma, C. Müller-Schloer, and Y. Hua, eds., *Autonomic and Trusted Computing, 4th International Conference, ATC 2007, Hong Kong, China, July 11-13, 2007, Proceedings*, vol. 4610 of *Lecture Notes in Computer Science*, Springer, 2007.

T. Vazão, M. M. Freire, and I. Chong, eds., *Information Networking. Towards Ubiquitous Networking and Services, International Conference, ICOIN 2007, Estoril, Portugal, January 23-25, 2007. Revised Selected Papers*, vol. 5200 of *Lecture Notes in Computer Science*, Springer, 2008.

A. Mishra, V. Brik, S. Banerjee, A. Srinivasan, and W. A. Arbaugh, "A client-driven approach for channel management in wireless lans," in *INFOCOM*, IEEE, 2006.

T. Fraser, N. L. P. Jr., and W. A. Arbaugh, "Applying flow-sensitive cqual to verify minix authorization check placement," in *PLAS* (V. C. Sreedhar and S. Zdancewic, eds.), pp. 3–6, ACM, 2006.

Nick L. Petroni Jr. and Tim Fraser and William A. Arbaugh, "An Architecture for Specification Based Detection of Integrity Violations in Kernel Dynamic Data," in *Proceedings of the 15th USENIX Security Symposium*, pp. 289–304, August 2006.

A. Mishra, V. Shrivastava, S. Banerjee, and W. Arbaugh, "Partialy Overlapped Channels Not Considered Harmful," in *Proceedings of ACM SIGMETRICS*, ACM, 2006.

A. Mishra, E. Rozner, S. Banerjee, and W. Arbaugh, "Expoliting Partially Overlapping Channels in Wireless Networks: Turning Peril into an Advantage," in *To appear in the Proceedings of the Internet Measurement Conference*, USENIX, October 2005.

Y. Yuan, H. Starsky, Y. Wong, S. Lu, and W. Arbaugh, "ROMER: resilient opportunistic mesh routing for wireless mesh networks," in *Proceedings of IEEE WiMesh 2005*, IEEE.

H. Yang, F. Ye, Y. Yuan, S. Lu, and W. Arbaugh, "Toward resilient security in wireless sensor networks," in *Proceedings of Mobihoc 2005*, pp. 34 – 45, ACM, May 2005.

Z. Yu, C.-Y. Seng, T. Jiang, X. Wu, and W. Arbaugh, "Robust routing in malicious environment for ad hoc networks.," in *The First Information Security Practice and Experience Conference*, pp. 36–47, Apr. 2005.

Y. Yuan and W. A. Arbaugh, "A Secure Service Discovery Protocol for MANET," in *IEEE Proceedings on Personal, Indoor and Mobile Radio Communications*, pp. 502 – 506, 2003.

Y.Yuan, D. Gu, W. Arbaugh, and J. Zhang, "High-performance mac for high-capacity wireless lans," in *Proceedings of the International Conference On Computer Communications and Networks (ICCCN 2004), October 11-13, 2004, Chicago, IL, USA*, pp. 167 – 172, IEEE, 2004.

Y. Yuan, D. Gu, W. Arbaugh, and J. Zhang, "Achieving packet-level quality of service through scheduling in multirate WLANs," in *IEEE Vehicular Technology Conference (VTC), VTC Fall 2004*, Sept. 2004.

Nick L. Petroni Jr., Tim Fraser, Jesus Molina, and William A. Arbaugh, "Copilot- A Coprocessor-based Kernel Runtime Integrity Monitor," in *Proceedings of the 13th USENIX Security Symposium*, pp. 179–194, August 2004.

Min-ho Shin, Arunesh Mishra, and William A. Arbaugh, "An Efficient Handoff Scheme in IEEE 802.11 using Neighbor Graphs," in *Proceedings of the Second International Conference on Mobile Systems, Applications, and Services*, 2004.

Arunesh Mishra, Min-ho Shin, and William A. Arbaugh, "Context Caching using Neighbor Graphs for Fast Handoffs in a Wireless Network," in *Proceedings of the 23rd Conference on Computer Communications (INFOCOM)*, March 2004.

Rakesh Bobba, Laurent Eschenauer, Virgil Gligor, and William Arbaugh, "Bootstrapping Security Associations for Routing in Mobile ad-hoc Networks," in *Global Telecommunications Conference (GLOBECOM), 2003*, vol. 3, pp. 1511 – 1515, IEEE.

A. Khalili, J. Katz, and W. A. Arbaugh, "Toward Secure Key Distribution in Truly Ad-Hoc Networks," in *IEEE Workshop on Security and Assurance in Ad-Hoc Networks in conjunction with the 2003 International Symposium on Applications and the Internet*, pp. 342–346, IEEE Computer Society, January 2003.

J. Molina and W. A. Arbaugh, "Using Independent Auditors as Intrusion Detection Systems," in *Proceedings of the Fourth International Conference on Information and Communications Security* (S. Qing, F. Bao, and J. Zhou, eds.), vol. 2513 of *LNCS*, pp. 291 – 302, 2002.

W. A. Arbaugh, "Active Systems Management: The Evolution of Firewalls," in *Invited paper to the Third International Workshop on Information Security Applications*, pp. 19–30, August 2002.

W. A. Arbaugh, N. Shankar, and J. Wang, "Your 802.11 Network has no Clothes," in *Proceedings of the First IEEE International Conference on Wireless LANs and Home Networks*, pp. 131 – 144, December 2001.

N. Itoi, W. A. Arbaugh, S. Pollack, and D. M. Reeves, "Personal Secure Booting," in *Proceedings of the Sixth Australian Conference on Information Security and Privacy*, pp. 130 – 144, July 2001.

H. Browne, W. A. Arbaugh, J. McHugh, and W. L. Fithen, "A Trend Analysis of Exploitations," in *Proceedings of the 2001 IEEE Symposium on Security and Privacy*, pp. 214 – 229, May 2001.

W. A. Arbaugh, A. D. Keromytis, and J. M. Smith, "DHCP++: Applying an efficient implementation method for fail-stop cryptographic protocols," in *Proceedings of Global Internet (GlobeCom) '98*, November 1998.

W. A. Arbaugh, A. D. Keromytis, D. J. Farber, and J. M. Smith, "Automated Recovery in a Secure Bootstrap Process," in *Proceedings of Network and Distributed System Security Symposium*, pp. 155–167, Internet Society, March 1998.

W. A. Arbaugh, D. J. Farber, and J. M. Smith, "A Secure and Reliable Bootstrap Architecture," in *Proceedings 1997 IEEE Symposium on Security and Privacy*, pp. 65–71, May 1997.

Technical Reports, and Notes

T. C. Clancy and W. Arbaugh, "Internet draft: Eap password authenticated exchange," May 2004.

T. C. Clancy, N. Petroni, and W. Arbaugh, "Internet draft: Technique for method-specific fast eap rekeying," February 2004.

W. A. Arbaugh, "The Real Risk of Digital Voting," *IEEE Computer*, vol. 37, pp. 124 – 125, December 2004.

W. A. Arbaugh, "A Patch in Nine Saves Time," *IEEE Computer*, vol. 37, pp. 82 – 83, June 2004.

W. A. Arbaugh, "Firewalls: An Outdated Defense," *IEEE Computer*, vol. 36, pp. 112 – 113, June 2003.

W. A. Arbaugh, "Wireless Security is Different," *IEEE Computer*, vol. 36, pp. 99 – 101, August 2003.

N. Shankar and W. A. Arbaugh, "On Trust for Ubiquitous Computing," in *Invited paper in the Workshop on Security for Ubiquitous Computing, UBICOMP*, October 2002.

Z. Yu, T. Jiang, X. Wu, and W. A. Arbaugh, "Risk Based Probablistic Routing for Ad Hoc Networks." Peer reviewed poster session at Wireless Security Workshop in conjunction with Mobicom, September 2002.

W. A. Arbaugh, "Improving the TCPA," *IEEE Computer*, vol. 35, pp. 77 – 79, August 2002.

W. A. Arbaugh, "Security: Technical, Social, and Legal Challenges," *IEEE Computer*, vol. 35, pp. 109 – 111, February 2002.

A. Mishra and W. A. Arbaugh, "An Initial Security Analysis of the IEEE 802.1X Standard," Tech. Rep. CS-TR-4328, University of Maryland, College Park, February 2002.

W. A. Arbaugh and L. van Doorn, "Special Issue on Embedded Systems Security," *IEEE Computer*, pp. 11 – 13, October 2001.

L. van Doorn, G. Ballintijn, and W. A. Arbaugh, "Design and Implementation of Signed Executables for Linux," Tech. Rep. CS-TR-4259, University of Maryland, College Park, June 2001.

N. Shankar, W. A. Arbaugh, and K. Zhang, "A Transparent Key Management Scheme for Wireless LANs Using DHCP," Tech. Rep. HPL-2001-227, HP Laboratories, 2001.

R. Droms and W. Arbaugh, "Authentication for DHCP Messages." RFC 3118, June 2001.

W. A. Arbaugh, *Chaining Layered Integrity Checks*. PhD thesis, University of Pennsylvania, 1999.

Invited Talks and Presentations

Invited Conference talks

R&D Technical Transfer: A Worked Example, Invited talk at Department of Homeland Security INFOSEC Technology Transition Council Meeting, February 2010.

The Road to Acquisition, Invited Keynote at Director, Defense Research and Engineering (DDR&E) Small Business Summit, July 2009.

Treacherous or Trusted Computing?, Invited talk at USENIX Security Symposium, August 2005.

Ad-hoc network security: Is it a Real Problem?, Invited talk at SecureComm, Athens, *Greece*, September 2005.

The Convergence of Ubiquity, Invited talk at USENIX Annual Technical Conference, San Antonio, Texas, June, 2003.

Active Systems Management: The Evolution of Firewalls, Invited talk at the International Workshop on Information Security Applications, Jeju, *South Korea*, August 2002.

Government Presentations

Computer Security Issues

The President's Commission on Critical Infrastructure Protection, January 1997.

Director of Central Intelligence (Designate), Anthony Lake, January 1997.

Secretary of Defense, William J. Perry, November 1996.

Chairman of the Joint Chiefs of Staff, General John Shalikashvili, June 1996.

Deputy Director of Central Intelligence, George J. Tenet, May 1996.

Senator Daniel Patrick Moynihan, April 1996.

Senator Barbara A. Mikulski, April 1996.

Workshop talks

Semantic Integrity, Invited talk at the Katholieke Universiteit Leuven, *Belgium*, May 2005.

High Assurance Rootkit Detection and Respsone, talk at ARDA Workshop on next generation malware, April 2005.

UWIN: Ubiquitous Wireless Internetworking Test-bed, Invited talk at Microsoft's Mesh Networking Summit, June 2004.

Neighbor Graphs and Mobility, Invited talk at Microsoft Research, November 2003.

Comparing Secure boot with Authenticated boot, Trusted Computing: Who's in Control Panel, invited panelist, Fifth Smart Card Research and Advanced Application Conference, San Francisco, California, November 2002.

Wireless LAN Security: Problems and Solutions, half day tutorial given at the Network and Distributed System Security conference, February 2002.

Wireless LAN Security: Problems and Solutions, Short course given at SANS Network Security Conference, October 2001.

Wireless Local Area Network Security: Fact or Fiction

COMDEX, November 2001.

Mitretek, June 2001.

T.J. Watson Research, IBM, June 2001.

An Inductive Chosen Plaintext Attack against WEP/WEP2, IEEE 802.11 Task Group on Security (TGi), May 2001.

Bootstrap Related Security Issues

San Diego Supercomputer Center, University of San Diego, February 1999.

Naval Post Graduate School, July 1999.

Microsoft Research, July 1997.

A Secure and Reliable Bootstrap Architecture, The Platform Architecture Laboratory, Intel Corporation, June 1997.

Software Artifacts

IEEE 802.1X implementation. The first open source mplementation of the IEEE standard for authentication and access control. As a result, both the client and server portions have been used in multiple commercial products– available at `http://www.open1x.org`.

Gifts, Grants, and Contracts

Science of Security. Army Research Lab, $1,511,501 (co-PI with J. Katz) (grant) *September 2011.*

Secure Execution Partition (SEP) for Remote Voting. National Science Foundation, $169,822 (grant) *September 2010.*

Mesh Network Security. Microsoft Research, $15,000 (gift)
July 2005.

Wireless Wide-Area Test-bed. DoCoMo USA Laboratory, $60,000 (grant)
October 2004 – October 2005.

UWIN Test-bed. Samsung Advanced Institute of Technology, $120,000 (Gift and Grant),
December 2004 – December 2005.

Wireless Wide-Area Test-bed. U.S. Department of Defense Laboratory for Telecommunications Science (Joseph JaJa, PI), $390,000,
January 2004 – December 2004.

Active Systems Managemant. U.S. Department of Defense Laboratory for Telecommunications Science (Joseph JaJa, PI), $250,000,
January 2004 – December 2004.

WLAN Secure Roaming, Samsung Advanced Institute of Technology, $100,000 (Gift and Grant),
June 2003 – June 2004.

WLAN Secure Roaming, Samsung Advanced Institute of Technology, $97,542 (Gift and Grant),
June 2002 – June 2003.

CAREER: Active Systems Management, NSF CAREER award,$488,188,
September 2002 – September 2007.

A Secure Wireless LAN/MAN Infrastructure Test Bed, NIST, $1,783,268,
October 2001 – October 2005, joint with Prof. Ashok Agrawala.

Security Enchanced Booting for Operating Systesm. DARPA, $585,113,
June 2001 – July 2003.

IBM Faculty Partnership Award. IBM Corporation, $40,000,
June 2001.

Active Systems Managemant. U.S. Department of Defense Laboratory for Telecommunications Science (Joseph JaJa, PI), $250,038,
January 2001 – December 2001.

Maryland Information Security Laboratory. IBM equipment grant (SUR), $110,000,
December 2000.

IBM Faculty Partnership Award, IBM Corporation, $40,000,
August 2000.

Out of Band Cryptographic Configuration Management. DARPA via University of Pennsylvania, $98,559,
July 2000 – July 2001.

Honors and Awards

Louis W. Tordella Award: One of two NSA wide awards given in recognition of exceptional teamwork, collaboration, and success in the mission of World Class Cryptography, June 1997.

Science and Technology Award: The highest award given in the Directorate of Engineering and Technology for the recognition of an exceptional individual technical accomplishment, May 1997.

Signals Intelligence Engineering Medal: An award given by the Deputy Director of Technology (DDT) recognizing a significant technical accomplishment by an individual. This was the first time that a member of the research organization received the medal, May 1996.

Honor Graduate: U.S. Army Signal (Communications) Officer Basic Course. The top three graduates out of 200 students are named an honor graduate, March 1985.

U.S. Grant Memorial Award: Given to the graduating student with the highest grade point average in computer science. United States Military Academy, May 1984.

Service and Teaching

Editorial Positions

Guest Editor, IEEE Security and Privacy Magazine, Spring 2011.

Board member, IEEE Security and Privacy Magazine Editorial board, May 2003 - 2007.

Board member, IEEE Computer Magazine Editorial board, January 2002 - 2006.

Editor, IEEE Computer Magazine Information Security bi-monthly column, January 2002 - 2004.

Conference Discussion Panels

Invited Speaker, National Science Foundation, Trusted Computing Workshop. October 2010.

Panelist, Infocom, Paranoid Protocol Design for Wireless Networks, Jean-Pierre Hubaux, Ed Knightly, Adrian Perrig, Nitin Vaidya, Markus Jakobsson, March 2005.

Panelist, USENIX Security, Revisiting Trusted Computing, David Farber, Lucky Green, Leendert van Doorn, Peter Biddle, August 2003.

Panelist, Smart Card Research and Advanced Application Conference, Trusted Computing, November 2002.

Advisory Boards and Workshops

Member, Microsoft Trusted Computing Academic Advisory Board, January 2010 - present.

Member, Director, Defense Research and Engineering (DDR&E)/IARPA Cyber Security Technology Study, Summer-Fall 2009.

Member, Defense Advanced Research Project Agency, Information Science and Technology Study Group, 2004 - 2007.

ARDA Workshop, Next Generation Malware, Columbia, Maryland. April, 2005.

AAAS Workshop, AAAS Workshop on E-Voting Technologies, Washington, DC. September, 2004.

Organizer, *DIMACS Workshop on Mobile and Wireless Security*, November 3–4, 2004. *http://dimacs.rutgers.edu/Workshops/MobileWireless/*

ARIB Frequency Resources Development Symposium, May 2003, Tokyo, *Japan*. *http://www.arib.or.jp/english/*

DARPA Workshop, Composable High Assurance Trusted Systems #2 (CHATS2), Napa, California. November 2000.

Program Committees

Program Committee Member, CANS 2010.

Program Committee Member, USENIX Security 2006.

Program Committee Co-Chair, 2006 Network and Distributed Security Symposium.

Program Committee Member, Mobicom 2005.

Program Committee Member, Mobisys 2005.

Program Committee Member, Network and Distributed Security Symposium, 2003, 2004 Program Committees.

Program Committee Member, IEEE Security and Privacy Conference, 2002, and 2005 Program Committees.

Reviewer, IEEE Security and Privacy Conference, 2001.

Teaching

CMSC 412, Operating Systems, Fall 2010, 40 students. I completely redesigned the course to use the Windows Research Kernel rather than *GeekOS*. The students modified the scheduler, and wrote a kernel mode rootkit detector as class labs.

CMSC 311, Computer Organization, Fall 2009, 100 students.

CMSC 414, Computer and Network Security, Fall 2005, 57 students.

CMSC 818A, Embedded Security Seminar class, Spring 2005, 5 students.

CMSC 311, Computer Organization, Fall 2004, 50 students.

CMSC 311, Redesign of Computer Organization syllabus, Spring 2004, two sections, est. 80 students.

CMSC 414, Computer and Network Security, Spring 2003, 42 students.

CMSC818Y, Advanced Topics in Computer and Network Security: Wireless Network Security, Spring 2002, 32 students.

CMSC414, Computer and Network Security, Fall 2001, 61 students.

CMSC414, Computer and Network Security, Spring 2001, 41 students.

CMSC818Z, Advanced Topics in Computer and Network Security, Fall 2000, 18 students.

Graduated Students

Jesus Molina, MS ECE, Fujitsu.

Arunesh Mishra, PhD, Google.

Nick Petroni, PhD, Institute for Defense Analysis.

Yuan Yuan, PhD, Google.

Min-ho Shin, PhD, Assistant Professor, Myongji University.

Charles Clancy, PhD, Associate Professor, Virginia Tech.

Chuk Seng, PhD.

Administrative Service

Member, Cyber Center Director Hiring Committee – Spring 2011.

Chair, Systems Field Area. Fall 2003 – Spring 2004.

Member, Graduate Program Review Committee. Spring 2002.

Member, Laboratory Committee. Fall 2000 – present.

Member, UMIACS APT Committee, Fall 2001.

Member, CS Hiring Committee, Fall 2001.

Chair, Administrative Hiring Committee, Summer 2001.

Selected Press Coverage

CBS Evening News, "Maryland voting machines," February 2004.

J. Markoff, "Flaws in Popular Wireless Standard." New York Times, April 2001.

J. Schwartz, "Security Poor in Electronic Voting Machines, Study Warns." New York Times, January 2004.

"Wireless Security." The Economist Technology Quarterly, September 2001.

All Things Considered, "Hackers help test voting machines." `http://www.npr.org/templates/story/story.php?storyId=1624506`, January 2004.

P. Connolly, "Summer smorgasbord." `http://iwsun4.infoworld.com/articles/op/xml/01/06/25/010625opsecurity.xml`, June 2001. InfoWorld.

P. Connolly, "Wireless security riddled with flaws." `http://www.infoworld.com/cgi-bin/fixup.pl?story=http://www.infoworld.com/articles/tc/xml/01/06/25/010625tcsecurity.xml&dctag=security`, June 2001. InfoWorld.

Slashdot, "New flaws in 802.11b." `http://www.slashdot.org/articles/01/04/03/160236.shtml`, March 2001.

Slashdot, "LinuxBIOS Boots Linux, OpenBSD, Windows." http://developers.slashdot.org/article.pl?sid=02/11/25/0331220&tid=8&tid=106, November 2002.

Slashdot, "LinuxBIOS Project USENIX Paper." http://developers.slashdot.org/article.pl?sid=03/12/10/1434210&tid=190&tid=185&tid=8&tid=137, December 2003.

Slashdot, "Maryland Electronic Voting Sytems Found Vulnerable." http://yro.slashdot.org/article.pl?sid=04/01/30/1631243&tid=103&tid=126&tid=17, January 2004.