



Workshop Keynote



Dr. Farnam Jahanian serves as the National Science Foundation Assistant Director for the Computer and Information Science and Engineering (CISE) Directorate. He guides CISE in its mission to uphold the nation's leadership in scientific discovery and engineering innovation through its support of fundamental research in computer and information science and engineering and transformative advances in cyberinfrastructure. Dr. Jahanian oversees the CISE budget of over \$850 million, directing programs and initiatives that support ambitious long-term research and innovation, foster broad interdisciplinary collaborations, and contribute to the development of a computing and information technology workforce with skills essential to success in the increasingly competitive, global market. He also serves as co-chair of the Networking and Information Technology Research and Development (NITRD) Subcommittee of the National Science and Technology Council Committee on Technology, providing overall coordination for the activities of 17 government agencies. Dr. Jahanian holds the Edward S. Davidson Collegiate Professorship in Electrical Engineering and Computer Science at the University of Michigan, where he served as Department Chair for Computer Science and Engineering from 2007 - 2011 and as Director of the Software Systems Laboratory from 1997 - 2000. Earlier in his career, he held research and management positions at the IBM T.J. Watson Research Center. Over the last two decades at the University of Michigan, Dr. Jahanian led several large-scale research projects that studied the growth and scalability of the Internet infrastructure, which ultimately transformed how cyber threats are addressed by Internet Service Providers. His research on Internet infrastructure security formed the basis for the successful Internet security services company Arbor Networks, which he co-founded in 2001. Dr. Jahanian served as Chairman of Arbor Networks until its acquisition in 2010. His work on Internet routing stability and convergence has been highly influential within both the network research and the Internet operational communities and was recognized with an ACM SIGCOMM Test of Time Award in 2008. Dr. Jahanian is the author of over 100 published research papers and has served on dozens of national advisory boards and panels. He is a member of the National Governors Association's Cybersecurity Advisory Council. Dr. Jahanian has testified before Congress on a broad range of topics, including cybersecurity and Big Data. He has been an active advocate for how basic research can be uniquely central to an innovation ecosystem that drives global competitiveness and addresses national priorities. He received numerous awards for his innovative research, commitment to education, and technology commercialization activities. He was named Distinguished University Innovator at the University of Michigan (2009) and received the Governor's University Award for Commercialization Excellence (2005). Dr. Jahanian holds a master's degree and a Ph.D. in Computer Science from the University of Texas at Austin. He is a Fellow of the Association for Computing Machinery (ACM), the Institute of Electrical and Electronic Engineers (IEEE), and the American Association for the Advancement of Science (AAAS).

Dinner Keynote Speaker



Eugene H. Spafford is a professor of Computer Sciences at Purdue University. He is also the founder and Executive Director of the Center for Education and Research in Information Assurance and Security. He has done lots of things related to computing, security, privacy, and education during his career. With advancing age, he remembers only about half of them, and for the other half he is worried that the statute of limitations has not expired. With 30 years of experience in the field, he is frequently called by leaders in government and industry... although that is largely because his phone number is only 1 digit different from that of a pizza delivery service. Despite this, he continues to exhibit the kind of cheerful demeanor only a professional curmudgeon can have, no doubt helped along by the many persistent problems in the field. Professor Spafford has received a number of lifetime achievement awards, including induction into the Cyber Security Hall of Fame, but he has not taken the hints and retired. He has vowed to keep on working until he has minions, groupies, or both. He will thus be presenting at this workshop. You have been warned.

Workshop Co-Chairs



Karl Levitt conducts research in the areas of computer security, automated verification, and software engineering. With respect to computer security he is working on techniques to detect malicious code (viruses, worms, time bombs, etc.) in programs and to detect attempts to penetrate or misuse computer systems, especially computer networks. With respect to verification, he is applying an automated theorem prover (Higher Order Logic - HOL) to the verification of hardware and software systems, especially operating systems for safety-critical embedded systems. With respect to software engineering, he is working on new methods for testing programs that make use of heuristic techniques and methods for automating the generation of operating system code from templates.



Patrick Lincoln is director of the Computer Science Laboratory at SRI International. He is also the executive director of SRI's program for the Department of Homeland Security's Cyber Security Research and Development Center and director of the SRI Center for Computational Biology. Lincoln leads research in the fields of formal methods, computer security and privacy, computational biology, scalable distributed systems, and nanoelectronics. He has led multidisciplinary groups conducting high-impact research projects in symbolic systems biology, scalable anomaly detection, exquisitely sensitive biosensor systems, strategic reasoning and game theory, and privacy-preserving data sharing. He has published dozens of influential papers, holds several patents, has served on scientific advisory boards for private and publicly held companies, nonprofits, and government agencies and departments. Lincoln holds a Ph.D. in computer science from Stanford University and a B.Sc. in computer science from MIT. He has previously held positions at MCC, Los Alamos National Laboratory, and ETA Systems. Lincoln was named an SRI Fellow in 2005.

Government Sponsors



Keith Marzullo is currently the Division Director for the Computer and Network Systems (CNS) Division in the Computer and Information Science and Engineering (CISE) Directorate at the National Science Foundation. He is at NSF on leave from the Computer Science and Engineering Department at the University of California, San Diego. He has been on the UCSD faculty since 1993. He received his Ph.D. in Electrical Engineering from Stanford University in 1984; for his Ph.D. he developed the Xerox Research Internet Clock Synchronization protocol, which was one of the first practical fault-tolerant protocols that addressed this issue. In 1986, he left Xerox and joined the CS Department at Cornell University where with colleagues Ken Birman and Robert Cooper, he started the company ISIS Distributed Systems, which provided middleware for fault tolerant distributed applications; this software was used by financial and investment institutions. He served as a Professor at Large in the Computer Science Department at the University of Tromso from 1999-2003, was Chair of ACM SIGOPS from 2003-2007, and Chair of the CSE Department from 2006-2010. His current research focuses on issues in distributed systems and security. He is a Fellow of the ACM.



Jeryl L. Mumpower is the Division Director for the Division of Social and Economic Sciences in the Directorate Social, Behavioral, and Economic Sciences at the National Science Foundation. He joined the Bush School faculty as the director of the Master's in Public Service and Administration (MPSA) program. Dr. Mumpower came to the Bush School from the Nelson A. Rockefeller College of Public Affairs and Policy, State University of New York at Albany, where he was professor of public administration, public policy, public health, and information science and directed programs at both the master's and doctoral levels. While at Albany, Dr. Mumpower also served in a variety of administrative positions, in both interim and permanent capacities, including Dean of Graduate Studies, Provost, Vice President for Research, and Dean of both the College of Arts and Sciences and School of Public Health. In addition, he has been Director of Albany's Center for Policy Research and Associate Director at the Rockefeller Institute of Government. His previous experience includes six years as a program director and policy analyst at the National Science Foundation. Mumpower received his BA from the College of William and Mary and his PhD in social and quantitative psychology from the University of Colorado, Boulder. He is author or editor of nine books and more than fifty book chapters and articles. His research has addressed basic and applied topics in negotiation and bargaining, environmental policy, individual and group decision making processes, the use of scientific expertise in public policy making, and risk analysis and management. He has consulted extensively at both national and state levels of government.



Jeremy Epstein is the lead program officer for the NSF Secure and Trustworthy Cyberspace program, NSF's flagship cybersecurity research program. He's on loan to NSF from SRI International, where he focuses on software security and voting system security. He's associate editor in chief of IEEE Security & Privacy Magazine. Jeremy has a BS from New Mexico Tech and an MS from Purdue University, both in computer science, and is ABD from George Mason University in information technology.

Invited Speakers



Susan Alexander is Director of IARPA's Office of Safe and Secure Operations. She joined IARPA in March 2012. A career National Security Agency (NSA) senior executive, she has served in many science and technology leadership positions in Government including as Associate Deputy Director for Information Assurance Strategy and Director of the National Information Assurance Research Laboratory at NSA, Chief Technology Officer for Cyber, Information and Identity Assurance in the Office of the Secretary of Defense, and senior advisor to the director of the Joint Interagency Cyber Task Force overseeing the Government's Comprehensive National Cyber Initiative (CNCI) in the Office of the Director of National Intelligence (ODNI). After graduating from Yale, Ms. Alexander trained as a cryptanalyst and worked extensively in foreign intelligence before turning to the harder problem of information assurance. She is a recipient of the Defense Meritorious Civilian Service Award.



Asha Balakrishnan brings engineering expertise to STPI work in the areas of innovation, competitiveness, and STEM education. Some of her projects at STPI include work related to underrepresented minorities in STEM education and high-skilled immigration of students studying STEM. Some of her previous research focused on developing experimentation techniques and biomechanical models of the brain to understand traumatic brain injury. Dr. Balakrishnan holds a BS in mechanical engineering from the University of Illinois. Both her MS and PhD are in mechanical engineering from the Massachusetts Institute of Technology.



Dennis Bartko is the Director's Special Assistant for Cyber at the National Security Agency and Chief of the NSA Cyber Task Force. In that position, he also represents NSA on the Cyber Interagency Policy Coordination Committee led by the National Security Staff at the White House. During his tenure Mr. Bartko has also served as a project engineer, program manager, and a line manager in a number of technical organizations. More recently, he served as the Deputy Chief of Cryptanalysis and Exploitation Services and Turbulence Production Coordinator. Beyond the walls of NSA, Mr. Bartko, was a NSA Legislative Fellow, a legislative assistant for Congressman Robert L. Ehrlich, Jr. and he performed a one year tour at Bell Atlantic/Verizon Communications to further explore private industry business processes and practices. Mr. Bartko is a member of the Institute of Electrical and Electronic Engineers. His awards include the Presidential Rank of Meritorious Executive, the National Intelligence Meritorious Unit Citation, Director's Productivity Improvement Award, and Meritorious Civilian Service Award.



Bennett Bertenthal was appointed Assistant Director of the Social, Behavioral, and Economic Sciences Directorate on January 1, 1997. This Directorate is organized into four divisions: Behavioral and Cognitive Science (BCS), Social and Economic Science (SES), International Programs (INT), and Science Resources Studies (SRS). The BCS and SES Divisions support research designed to advance our fundamental scientific knowledge about human social and cognitive behavior, and social and economic systems and organizations. Currently, he serves on a number of National Science and Technology Council sub-committees concerned with basic science and fundamental research on children. He is also a member of the Organization for Economic Cooperation and Development (OECD) steering committee on the development of infrastructure for the social and behavioral sciences. Dr. Bertenthal is the author of over 70 publications on perceptual and cognitive development, developmental methodology, visual processing of motion information, and nonlinear modeling of posture and gait. Recent publications include an Annual Review of Psychology chapter on the origins of perception, action,

and representation, and a Handbook of Child Psychology chapter on perception and action. During the past two years, he has lectured extensively on challenges and opportunities for the social and behavioral sciences, and was a keynote speaker last Spring at the Workshop on the Social Sciences organized by the Organization for Economic Cooperation and Development. He is a fellow of the American Psychological Society and the American Psychological Association, and he is a member of the Society for Research in Child Development, the Psychonomic Society, the International Society for Infant Studies, the International Society for the Study of Posture and Gait, the American Association for the Advancement of Science, and the Association for Research in Vision and Ophthalmology. Dr. Bertenthal was the recipient of a Career Development Award (1985-90) from the National Institutes of Health, and received the American Psychological Associations Boyd R. McCandless Young Scientist Award for distinguished research in 1985. During his career, he has been awarded more than 20 grants and fellowships from federal and private agencies to support his research and teaching.



Marjory Blumenthal became Executive Director of PCAST, Office of Science and Technology Policy, The White House in 2013. Prior to this, she served as Associate Provost, Academic, at Georgetown University. Her responsibilities ranged from campus-wide academic planning to oversight of selected academic units, special working groups, and diversity initiatives. She was the Provost's liaison to the Senior Vice President for Research, working with him to represent and advance the University's research capabilities and accomplishments. Marjory has led efforts on the Main Campus to strengthen the sciences, and she coordinated science planning for the Provost. Her portfolio has an international dimension, with oversight of International Initiatives and the Office of International Programs (OIP). Another theme was the enhancement of academic excellence, in part through oversight of the Carroll Fellows Initiative, Fellowship Secretariat, Georgetown Undergraduate Research Opportunities Program (GUROP), and Honor Council; the Center for New Designs in Learning and Scholarship (CNDLS), which focuses on pedagogical innovation; the Kennedy Institute of Ethics; department and program reviews; and new faculty orientation. She led the reconceptualization of the School of Continuing Studies, and she is a founding member of the Steering Committee for the Reflective Engagement in the Public Interest initiative. She was the University's Accreditation Liaison Officer for the Middle States Commission on Higher Education, and she co-chaired the 2010-2012 self-study process. She also taught and advised students on Internet and cybersecurity trends and policy issues.



Bob Bonneau is Program Manager of the Air Force Office of Scientific Research, and has established programs in Networking and Communications in the Mathematics, Information, and Biological Sciences Division. He currently also is on detail to OSD. Previously, Dr. Bonneau was a senior research scientist at the Air Force Research Laboratory, Information Directorate in networking, communications, sensing, and computing, a Program Manager at the Defense Advanced Research Projects Agency (DARPA) in communications. He has held academic positions in communications and sensing at Rensselaer Polytechnic Institute and Columbia University. Dr. Bonneau has a Ph.D. in electrical engineering from Columbia University, and a Masters and Bachelors in electrical engineering from Cornell University. Dr. Bonneau is a senior member of IEEE and has over 70 journal and conference papers, one book co-authorship, contributed to 2 book chapters, and holds 3 patents.



David Clark is a Senior Research Scientist at the MIT Computer Science and Artificial Intelligence Laboratory, where he has worked since receiving his Ph.D. there in 1973. Since the mid 70s, Dr. Clark has been leading the development of the Internet; from 1981-1989 he acted as Chief Protocol Architect in this development, and chaired the Internet Activities Board. His current research looks at re-definition of the architectural underpinnings of the Internet, and the relation of technology and architecture to economic, societal and policy considerations.

He is helping the U.S. National Science foundation organize their Future Internet Design program. Dr. Clark is past chairman of the Computer Science and Telecommunications Board of the National Academies, and has contributed to a number of studies on the societal and policy impact of computer communications.



Robert Cunningham is the leader of the Cyber Systems and Technology Group and is responsible for initiating and managing research and development programs in information assurance and computer and platform security. From 1985 to 1987, Dr. Cunningham worked at Raytheon, designing and developing a parallel and distributed operating system for the next generation weather radar system. After completing his master's degree in 1988, he became a staff member of the Machine Intelligence Group at MIT Lincoln Laboratory, where his research

focused on machine learning, digital image processing and image and video understanding. As part of this effort, he contributed to early drafts of the real-time message passing interface (MPI/RT) specification. In early 1998 he transferred to the Information Systems Technology Group, where he pursued system security research and development. Initially, he focused on intrusion detection systems that do not require advance knowledge of the method of attack, then broadened to consider detection and analysis of malicious software. Most recently he has become interested in the design of tamper resistant systems. Throughout his time in the Group, he has been interested in evaluating the performance of security systems. Dr. Cunningham has patented security-related technology, presented and published widely, and has served as general chair for RAID and the IEEE Symposium on Security and Privacy, and as Chair or on program committees for RAID, WORM, IEEE HST, and the IEEE S&P, among others.



Roger Dingledine is project leader for The Tor Project, a US non-profit working on anonymity research and development. While at MIT he developed Free Haven, one of the early peer-to-peer systems that emphasized resource management while maintaining anonymity for its users. He works with the Electronic Frontier Foundation, the US Navy, Voice of America, the National Science Foundation, and other organizations to design and develop systems for anonymity and traffic analysis resistance. He organizes academic conferences on anonymity,

speaks at such events as Blackhat, Defcon, Toorcon, and the CCC congresses, and also does tutorials on anonymity for national and foreign law enforcement. Roger was honored in 2006 as one of the top 35 innovators under the age of 35 by Technology Review magazine.



Edward W. Felten is a Professor of Computer Science and Public Affairs at Princeton University, and is the founding Director of Princeton's Center for Information Technology Policy. His research interests include computer security and privacy, especially relating to media and consumer products; and technology law and policy. He has published about eighty papers in the research literature, and two books. His research on topics such as web security, copyright and copy protection, and electronic voting has been covered extensively in the popular press. His weblog, at freedom-to-tinker.com, is widely read for its commentary on technology, law,

and policy. He was the lead computer science expert witness for the Department of Justice in the Microsoft antitrust case, and he has testified in other important lawsuits. He has testified before the Senate Commerce Committee on digital television technology and regulation, and before the House Administration Committee on electronic voting. In 2004, Scientific American magazine named him to its list of fifty worldwide science and technology leaders.



Lisa Friedersdorf has been involved in nanotechnology for nearly twenty years, with a particular interest in advancing technology commercialization through university-industry-government collaboration. She is also a strong advocate for science, technology, engineering, and mathematics (STEM) education, and has over two decades of experience teaching at both the university and high school levels. For the past two years Dr. Friedersdorf has been assisting the NNCO as a full-time consultant on a wide variety of programs and projects. Prior to working with the NNCO, she was the Managing Director of the Institute for Nanoscale and Quantum Scientific and Technological Advanced Research (nanoSTAR) at the University of Virginia, where she fostered a campus-wide nanotechnology community, facilitated new collaborative research opportunities, and built external awareness of University capabilities and accomplishments in the field.



Deborah Frincke joined the National Security Agency in July 2011 as Deputy Director of the Research Directorate, Defense Intelligence Senior Executive Service (DISES). NSA's Research Directorate is the only "in-house" research organization in the Intelligence Community dedicated to advancing intelligence through science, drawing on diverse disciplines such as mathematics, computer science, engineering, physics, neuroscience, cognitive psychology and linguistics. Dr. Frincke is an affiliate Full Professor with the Information School at the University of Washington. Her published research spans a broad cross section of computer security. She remains professionally active: co-edits the Basic Training Board for IEEE Security and Privacy magazine, serves on numerous editorial boards and program committees such as the Journal of Computer Security, and represents the NSA in NITRD and National Intelligence Science & Technology Committee. Prior to joining NSA, Dr Frincke worked in academia, the Department of Energy National Laboratory system, and private industry.



Phillipa Gill is an assistant professor in the Computer Science Department at Stony Brook University. Her interests include computer networks, network measurement, inter-domain routing, Internet censorship/information controls, security and reliability. Prior to joining Stony Brook University, Phillipa Gill was a postdoctoral fellow at The Citizen Lab in the Munk School of Global Affairs at the University of Toronto where she worked on measuring Internet censorship around the globe. She completed her Ph.D. at the University of Toronto in 2012 and holds an M.Sc. and B.Sc. in Computer Science from the University of Calgary. During her Ph.D., she spent time as a visiting researcher at AT&T Labs–Research, Boston University, and Microsoft Research. Phillipa Gill's research area is computer networks with a focus on network measurement and characterization. She uses novel network measurement techniques, data analysis and ideas from economics to improve security and reliability of networks. Through dialogue with relevant stakeholders on the Internet — standardization bodies, government organizations, and network operators — she works to have real world impact with research. Phillipa Gill received the Best Paper Award - Internet Measurement Conference 2013 for her paper "Follow the Money: Understanding Economics of Online Aggregation and Advertising"; Best Presentation Award - IBM Workshop for Frontiers of Cloud Computing 2011 for her presentation "Understanding Network Failures in Data Centers:

Measurement, Analysis, and Implications"; Best Paper Award - Passive and Active Measurement Conference 2008 for her paper "The Flattening Internet Topology: Natural Evolution, Unsightly Barnacles or Contrived Collapse".



Virgil Gligor is a Professor in the Department of Electrical and Computer Engineering at Carnegie Mellon University and co-Director of the University's CyLab. CyLab establishes public-private partnerships for the research and development of technologies for security, privacy, and resiliency of computing and communication systems. Professor Gligor received his B.Sc., M.Sc., and Ph.D. degrees from the University of California at Berkeley. Prior to joining Carnegie Mellon, he was a Professor of Electrical and Computer Engineering at the University of Maryland (1976 – 2007). Gligor was a Visiting Professor at University of Cambridge (1999), ETH Zurich (2005), EPF Lausanne (2006), and a Research Professor at Singapore Management University and University of Maryland (2008-2011). He was a consultant to the Burroughs (1977-1981) and IBM (1984-1999) corporations, and has served on Microsoft's Trusted Computing Academic Advisory Board (since 2002), SAP's Security Advisory Board (since 2011), and Queen's University Belfast CSIT Advisory Board (since 2012). For nearly four decades, Professor Gligor's research interests have ranged from access control mechanisms, penetration analysis, and denial-of-service protection to cryptographic protocols and applied cryptography. His research addresses problems of trustworthy computing in the presence of an active adversary (e.g., malware, malicious insiders) and next generation secure Internet. In 2013, Gligor received the IEEE Computer Society Technical Achievement Award for pioneering work and leadership in the area of computer and network security.



Cleotilde (Coty) Gonzalez is a leader in the area of Decision Making in Dynamic Environments. She investigates experience-based decision making, through experimental and computational modeling methods. Her research goal is to determine when and how individuals rely on experience to make decisions and how experience helps decision makers adapt to novel situations. Her work relies on a theory of learning and decisions from experience in dynamic tasks, called Instance-Based Learning Theory (IBLT). IBLT is represented computationally in a number of cognitive models to make predictions and provide additional theoretical insights on experience-based decision making. IBLT has been used to study decision making in a wide range of real-life contexts. Her leading publications in diverse fields demonstrate the wide-ranging applications of IBLT. Coty is the founding Director of the Dynamic Decision Making Laboratory. She has mentored dozens of post-doctoral and graduate students, guiding them towards creating and maintaining a productive research program, as evidenced by the positions of academic leadership that most of her students hold. Coty offers interdisciplinary courses in Dynamic Decision Making and Human Factors internationally, often in countries that are under-represented in the research community such as: Mexico, Poland, and Qatar. She makes key-note and invited speeches to diverse audiences all over the world. Coty is a professor in the department of Social and Decision Sciences at Carnegie Mellon University; affiliated faculty with the Human-Computer Interaction Institute, the Center for Cognitive Brain Imaging and the Center for Neural Basis of Cognition, all at Carnegie Mellon University; affiliated faculty with the Center for Research on Training at University of Colorado. She is part of the editorial board of the Journal of Behavioral Decision Making, American Journal of Psychology, and Human Factors Journal, and Associate Editor of the Journal of Cognitive Engineering and Decision Making and System Dynamics Review.



Rebecca Goolsby is a program officer at the Office of Naval Research, an anthropologist by training, and computational social scientist. Her portfolio concerns human security writ large and the new information age technologies that have transformed the human landscape: mobile phones, social media, crisis information tools (such as crisis mapping), models and analytics. Her goals are to improve the Navy's ability to understand social change, disaster response, civil violence and economic reconstruction in the developing world, particularly in societies in crisis. She has particular interests in social cyberthreats, health surveillance, and multi-scale, multi-modal analytics for decision making in high tempo crisis situations. Goolsby is formerly a Fulbright Scholar to Thailand, with specialties in SE Asia and Africa. She works closely with NSF and other federal agencies on critical science related to human security, society, and information technology. She also interacts a great deal with non-government agencies and the volunteer technical communities in crisis response.



Melanie Green is a social psychologist whose research has focused on the power of narrative to change beliefs, including the effects of fictional stories on real-world attitudes. Her theory of "transportation into a narrative world" focuses on immersion into a story as a mechanism of narrative influence. Dr. Green has examined narrative persuasion in a variety of contexts, from health communication to social issues. She has edited two books on these topics (*Narrative Impact* and *Persuasion: Psychological Insights and Perspectives, Second Edition*), and has published numerous articles in leading psychology, communication, and interdisciplinary journals. Dr. Green has also investigated the influence of technology (in particular, television and the Internet) on social capital, and the ways in which trust can develop in on-line relationships.



John Heimann is Senior Director, Security Programs in Oracle's Global Product Security organization. He is responsible for defining and overseeing development programs that improve the security assurance of Oracle's products, including cloud products and engineered systems. Mr. Heimann has 16 years experience in security program and product management at Oracle, and in the past was security product management lead for Oracle's Database, Application Server, and Applications products. Prior to Oracle, he spent 10 years at GTE Government Systems Corporation, working on secure network, cryptographic, and key management research, design, development, and vulnerability analysis programs. He has served on a US DoD executive advisory panel on Information Assurance. Mr. Heimann has an AB in Physics, cum laude, from Harvard University.



Warren A. Hunt, Jr. is a Professor at the University of Texas Computer Science Department, where he teaches formal methods and computer architecture, and where he investigates and develops methods for microprocessor specification and program verification, automated theorem-proving methods, and computational biology tools. Dr. Hunt is currently the PI for DARPA's CRASH effort at UT. Dr. Hunt has been active in the hardware verification area for more than 25 years, and he has applied formal verification tools and methods to a litany of microprocessor designs: FM8501, FM8502, FM9001, Motorola CAP DSP, FM9801, VIA Nano, and Oracle SPARC. Dr. Hunt completed the first complete mechanical verification of a microprocessor design in 1985, and he, along with Bishop Brock, specified, designed, and mechanically verified, the 32-bit FM9001, the first and only such verified microprocessor ever to be built. Dr. Hunt is the steering committee chairman of the FMCAD Conference series, and he serves as an associate editor of the "Formal Methods in System Design" journal. Prior to his 2002 arrival at UT, Dr. Hunt worked as a Research Staff Member and Manager at IBM's Austin

Research Laboratory from 1997 to 2002, where he was involved with formal verification and high-performance computing as one of the founders and PIs of IBM's DARPA PERCS project. From 1986 until 1997, he served as Vice President of Hardware Engineering at Computational Logic, Inc. From 1982 until 1985, Hunt served as Hardware and Systems Manager for Cyb Systems. Dr. Hunt has a BSEE from Rice University and a computer science PhD from UT Austin.



Sara Kiesler is Hillman Professor of Computer Science and Human Computer Interaction at Carnegie Mellon University. Kiesler applies behavioral and social science methods and thinking to technology design, especially to understanding how technologies challenge existing social and work behavior of individuals, groups, and organizations. She conducted among the first scientific studies of computer-mediated communication and early forms of the Internet. With Lee Sproull, she authored the seminal book, *Connections: New Ways of Working in the Networked Organization* (MIT Press). In the early to mid-1990s, as the general public began to use the Internet, she was a founding researcher of the HomeNet project, to observe how households used the Internet. She has collaborated extensively within Carnegie Mellon and with other university colleagues on social design of the Internet. Kiesler has studied technology in work settings and was among those who pointed out opportunities and problems associated with multidisciplinary and complex forms of collaboration, geographically dispersed science and project work (see *Distributed Work* with Pamela Hinds, MIT Press), information sharing, and the design of human-robot interaction. Kiesler is a fellow of the American Psychological Association, the Society for Psychological Science, the Association for Computing Machinery (ACM), and Psy Chi. She was elected to the CHI Academy in 2002, a group of researchers honored by ACM's Special Interest Group in Computer-Human Interaction of the Association for Computing, and received its Lifetime Achievement Award in 2009. Her research group received the Allan Newell Award for Research Excellence in 2013 for "elucidating the fundamental principles of human-robot interaction and its associated research methods."



Steven E. King is the Deputy Director for Cyber Security in the Information Systems and Cyber Security Directorate of ASD(R&E). His responsibilities include coordination of the DoD S&T investments in Cyber Security, Information Assurance (IA), Biometrics, and Computer Network Operations, interagency S&T coordination/collaboration and chair of the DOD Cyber S&T Working Group. He has led efforts to create major new Cyber Security S&T Initiatives within DOD including a large expansion of OSD cyber security Small Business Innovation Research projects. Dr. King led studies as part of the Guidance for the Development of the Force (GDF) and the National Military Strategy for Cyber Operations Implementation Plan which resulted in new major research initiatives on Cyber Conflict Defense. He represents the DoD research community in numerous interagency forums including the two research initiatives under the Comprehensive National Cybersecurity Initiative (CNCI). He recently led the QDR/DPPG S&T Study on Operating Effectively in Cyberspace and oversees the DDR&E Software Protection Initiative. Dr. King was trained as a research physicist specializing in basic and applied nuclear radiation detection, nuclear environmental studies and nuclear spectroscopy. He earned a B.S. degree and a Ph.D. degree in nuclear physics both from Duke University. His career included stints as a senior scientist at Technicare in medical imaging, as a research physicist at the Naval Research Laboratory, and as a program manager within the U.S.-Russian Joint Commission under Vice President Gore and Prime Minister Chernomyrdin. Dr. King was the first Director of the Defense Venture Catalyst Initiative, which was created to explore ways to engage the Venture Capital community to identify and enable rapid insertion of emerging technology into DOD. He is the recipient of the DoD Exceptional Civilian Service Award and the DOD CIO

Information Assurance Award. He has published 37 refereed papers and edited/sponsored several books on DoD information security research.

Paul Kozemchak is the Special Assistant to the Director Defense Advanced Research Projects Agency. Mr. Kozemchak is DARPA's liaison with the US Intelligence Community. He is a member of the Expert Advisory Group to the DNI's Scientific and Technical Intelligence Committee; the DNI's Intelligence Community Strategic Studies Group; and an advisor to the National Intelligence University and the Defense Science Board. He works with the National Intelligence Council on Global Trends 2030. He has served as a government advisor on several Defense Science Boards including: DOD 21st Century R&D Strategy; Countering Proliferation (Executive Secretary); Transnational Threats; Desert Storm Lessons Learned; and the Discriminate Use of Force.



Robert Laddaga joined DARPA in October 2013. His research interests include resilient computing systems and artificial intelligence (AI). Dr. Laddaga joined DARPA from Vanderbilt University, where he was a research professor in the Electrical Engineering and Computer Science Department of the School of Engineering. He was also a member of the Institute for Software Integrated Systems (ISIS) at Vanderbilt. Prior to joining Vanderbilt, Dr. Laddaga was chief scientist and vice president of Dynamic Object Language Labs, Inc., from 2010 to 2013. From 2006 to 2010, he was a senior scientist with Raytheon BBN Technologies, assisting in the management of its Artificial Intelligence Group and performing research in artificial intelligence. From 1996 to 2006, he was a research scientist at the Massachusetts Institute of Technology (MIT)'s Artificial Intelligence Laboratory. During that period, he also managed the Intelligent Information Infrastructure Project at MIT's Computer Science and AI Laboratory. From 1996-1999, he also served as a program manager in DARPA's Information Technology Office. Dr. Laddaga holds a Doctor of Philosophy degree in Philosophy from Stanford University, a Master of Science degree in Philosophy from the University of South Carolina, and a Bachelor of Science degree in Mathematics from the University of South Carolina. He has published nearly 40 peer-reviewed computer science papers and co-authored or edited four books.



Carl Landwehr is an American computer scientist whose research focus is cybersecurity and trustworthy computing. His work includes identification of software vulnerabilities toward high assurance software development, architectures for intrusion-tolerant and multilevel security systems, token-based authentication, and system evaluation and certification methods. Among other activities, he is currently a Lead Research Scientist at the Cyber Security Policy and Research Institute (CSPRI) at George Washington University. Landwehr has developed and led cybersecurity research programs at the National Science Foundation (2001-2004, 2009-2011), IARPA (2005-2009), Mitretek Systems and the Naval Research Laboratory (1982-1999). From 2007 to 2010, he served as Editor-in-Chief of *IEEE Security & Privacy Magazine* as well as Associate Editor of several IEEE journals. He was a member of DARPA's Information Science and Technology (ISAT) Study Group and has served on several studies for the National Academy of Sciences. Landwehr holds degrees from Yale University (BS) and the University of Michigan (MS, PhD). While at Michigan, he worked for the MERIT Network, currently the longest running regional computer network in the United States. He has taught and lectured widely, including at Purdue University, Georgetown University, Virginia Tech University, and the University of Maryland. Research begun while visiting at the Isaac Newton Institute at Cambridge eventually led to the development of a patent for a secure identification system held by Landwehr and Daniel Latham. His many publications are highly cited.

Carl Landwehr was interviewed by Gary McGraw of Cigital for the Silver Bullet podcasts on Security for IEEE discussing changing threats in cybersecurity. For the 30th Anniversary IEEE Symposium on Security and Privacy, he provided a history of U.S. Government investments in cyber security research. Landwehr is an IEEE Fellow (2013) and has received various awards, including the ACM SIGSAC's Outstanding Contribution Award (2009) and the National Science Foundation Director's Award for Meritorious Service (2012). He was a member of the founding class (2012) inducted into the National Cyber Security Hall of Fame.



Steven B. Lipner, CISSP, serves as Senior Director of Security Engineering Strategy at Microsoft Corporation. Mr. Lipner served as an Executive Vice President and General Manager for Network Security Products at Trusted Information Systems Inc. since February 1994. From February 1992 to February 1994, Mr. Lipner served as the Director of Information Systems, Center for Information Systems of The MITRE Corporation. Prior to that time, he held various engineering management positions with Digital Equipment Corporation ('DEC') from March 1981 to February 1992. From 1987 to 1992, he served as Engineering Group Manager of DEC's Secure Systems Group with responsibility for secure systems product development and business strategy. He serves as a Member of the Advisory Board of the Americas at the Americas at International Information Systems Security Certification Consortium, Inc. (ISC)2(R). Mr. Lipner received S.B. and S.M. degrees in Civil Engineering from the Massachusetts Institute of Technology and attended the Harvard Business School's Program for Management Development.



Doug Maughan is a Branch Chief in Homeland Security Advanced Research Projects Agency (HSARPA) within the Science and Technology (S&T) Directorate of the Department of Homeland Security (DHS). Doug is directing the Cyber Security Research and Development activities at HSARPA. Prior to his appointment at DHS, Doug was a Program Manager in the Advanced Technology Office (ATO) of the Defense Advanced Research Projects Agency (DARPA) in Arlington, Virginia. His research interests and related programs were in the areas of networking and information assurance. Prior to his appointment at DARPA, Doug worked for the National Security Agency (NSA) as a senior computer scientist and led several research teams performing network security research. Doug received Bachelors Degrees in Computer Science and Applied Statistics from Utah State University, a master's degree in Computer Science from Johns Hopkins University, and a PhD in Computer Science from the University of Maryland, Baltimore County (UMBC).



Celia Merzbacher is Vice President for Innovative Partnerships at the Semiconductor Research Corporation (SRC). She is responsible for developing new initiatives and partnerships with stakeholders in government and the private sector in support of SRC's research and education goals. She has led the establishment of T3S—SRC's newest research program, which focuses on Trustworthy and Secure Semiconductors and Systems. Prior to joining SRC, Dr. Merzbacher was Assistant Director for Technology R&D in the White House Office of Science and Technology Policy (OSTP), where she oversaw the National Nanotechnology Initiative and advised on a range of issues, including technology transfer, technical standards, and intellectual property. She also served as Executive Director of PCAST, the President's Council of Advisors on Science and Technology. Before her assignment at OSTP, she was a materials scientist at the Naval Research Laboratory in Washington DC.

Lynette I. Millett is the Associate Director of the Computer Science and Telecommunications Board, National Research Council of the National Academies. Ms. Millett has extensive experience as program manager, team leader, analyst, researcher, and writer with specific expertise in information technology policy. She is skilled in working with diverse and expert work groups and since 2000 has been developing, directing, and overseeing National Research Council studies and teams of national experts examining public policy issues related broadly to information technology, computing, software, and communications. Her portfolio at the National Research Council includes a suite of studies on computing research, the most recent being 2012's Computing Research for Sustainability; several examinations of government IT and infrastructure needs, such as 2011's Strategies and Priorities for Information Technology at the Centers for Medicare and Medicaid Services; and in-depth examinations of privacy, identity and cybersecurity, including 2010's Biometric Recognition: Challenges and Opportunities. Her policy and program management strengths are informed by a deep technical background. She has a proven track record of leading and working with diverse ad hoc teams to produce actionable, authoritative, and independent advice in fast-moving policy and technical environments. She has an M.Sc. in computer science from Cornell University, where her work was supported by graduate fellowships from the National Science Foundation and the Intel Corporation; and a B.A. with honors in mathematics and computer science from Colby College, where she was elected to Phi Beta Kappa.



Dusko Pavlovic was born in Sarajevo, studied mathematics at Utrecht, and was a postdoc at McGill, before starting an academic career in computer science at Imperial College and at Sussex. He left academia from 1999 to 2009 to work in software research at the Kestrel Institute in Palo Alto. He was a Visiting Professor at Oxford University from 2008-2012, a part-time Professor of Security at University of Twente starting in 2010, and a Professor of Information Security at the Information Security Group at Royal Holloway, University of London in 2011, before joining the ICS Department at the University of Hawaii at Manoa. Through the years, Dusko's publications covered a wide area of research interests, from mathematics (graphs, categories) through theoretical computer science (semantics, symbolic computation) and software engineering (behavioral specifications, adaptation), to security (protocols, trust, physical security) and network computation (information extraction).



Victor Piotrowski is a Lead Program Director at the National Science Foundation in Arlington, Virginia, where he is responsible for several programs related to Cybersecurity Education. In particular, he oversees the Federal Cyber Service: Scholarship for Service (SFS – CyberCorps™) program with an annual budget of \$45 million. This program seeks to increase the number of qualified students entering the field of cybersecurity and to increase the capacity of the United States higher education enterprise to continue to produce professionals in this field to meet the needs of our increasingly technological society. He also leads efforts related to Computing Education in the Division of Undergraduate Education including the Transforming Undergraduate Education in STEM (TUES) program, which seeks to improve the quality of science, technology, engineering, and mathematics education for all undergraduate students. Dr. Piotrowski co-manages the Advanced Technological Education (ATE) program targeting the education of technicians for the high-technology fields that drive our nation's economy, including cybersecurity professionals. The ATE program supports four cybersecurity centers. He is also a Program Officer in a new NSF-wide program Secure and Trustworthy Cyberspace (SaTC) supporting projects that address cybersecurity from one or more of three perspectives: Trustworthy Computing Systems; Social, Behavioral and Economics; and Transition to Practice; as well as proposals that focus on Cybersecurity Education.



Andrew Pollington is the program director for algebra and number theory in the Division of Mathematical Sciences at the National Science Foundation. Other program responsibilities include: computational and data-enabled science and engineering in mathematical and statistical sciences; mathematical sciences innovation incubator; research training groups in the mathematical sciences; secure and trustworthy cyberspace; software infrastructure for sustained innovation; workforce program in the mathematical sciences.



Mike Reiter is the Lawrence M. Slifkin Distinguished Professor in the Department of Computer Science at the University of North Carolina at Chapel Hill (UNC). He received the B.S. degree in mathematical sciences from UNC in 1989, and the M.S. and Ph.D. degrees in Computer Science from Cornell University in 1991 and 1993, respectively. He joined AT&T Bell Labs in 1993 and became a founding member of AT&T Labs – Research when NCR and Lucent Technologies (including Bell Labs) were split away from AT&T in 1996. He then returned to Bell Labs in 1998 as Director of Secure Systems Research. In 2001, he joined Carnegie Mellon University as a Professor of Electrical & Computer Engineering and Computer Science, where he was also the founding Technical Director of CyLab. He joined the faculty at UNC in 2007. Dr. Reiter's research interests include all areas of computer and communications security and distributed computing. He regularly publishes and serves on conference organizing committees in these fields. He served as program chair for the flagship computer security conferences of the IEEE, the ACM, and the Internet Society; as Editor-in-Chief of ACM Transactions on Information and System Security; and on the editorial boards of IEEE Transactions on Software Engineering, IEEE Transactions on Dependable and Secure Computing, the International Journal of Information Security, and Communications of the ACM. He also served on the Emerging Technology and Research Advisory Committee for the United States Department of Commerce for four years. Dr. Reiter was named an ACM Fellow in 2008 and an IEEE Fellow in 2014.



Stephanie Schuckers is an associate professor in the Department of Electrical and Computer Engineering at Clarkson University. Schuckers received the B.S. in electrical engineering from the University of Iowa in 1992. As a Whitaker Foundation Graduate Fellow, she received the M.S. and Ph.D. degree in electrical engineering from the University of Michigan in 1994 and 1997, respectively. Her research focuses on processing and interpreting signals, which arise from the human body. Signals include the electrocardiogram, biometric signals like fingerprints, respiration, and electroencephalograms. Methods involve classic signal processing, statistical techniques, pattern recognition, algorithm development and evaluation, data mining, and image processing. Much of her work involves analysis of real data collected from human, cadaver, and animal studies. For example, in work with the Department of Homeland Security, she is studying methods to increase the security of biometric systems, like fingerprint, iris, and face. Her work is funded from various sources, including National Science Foundation, American Heart Association, National Institute of Health, Department of Homeland Security, the Center for Identification Technology, and private industry, among others.



Hovav Shacham joined UC San Diego's Department of Computer Science and Engineering in Fall 2007. Shacham received his Ph.D. in computer science in 2005 from Stanford University, where he had also earned, in 2000, an A.B. in English. His Ph.D. advisor was Dan Boneh. In 2006 and 2007, he was a Koshland Scholars Program postdoctoral fellow at the Weizmann Institute of Science, hosted by Moni Naor. Shacham's research interests are in applied cryptography,

systems security, privacy-enhancing technologies, and tech policy. In 2007, Shacham participated in California Secretary of State Debra Bowen's "Top-to-Bottom" review of the voting machines certified for use in California. He was a member of the team reviewing Hart InterCivic source code; the report he co-authored was cited by the Secretary in her decision to withdraw approval from Hart voting machines.



Dawn Song is Associate Professor of Computer Science at UC Berkeley. Prior to joining UC Berkeley, she was an Assistant Professor at Carnegie Mellon University from 2002 to 2007. Her research interest lies in security and privacy issues in computer systems and networks, including areas ranging from software security, networking security, database security, distributed systems security, to applied cryptography. She is the recipient of various awards including the MacArthur Fellowship, the Guggenheim Fellowship, the NSF CAREER Award, the Alfred P. Sloan Research Fellowship, the MIT Technology Review TR-35 Award, the IBM Faculty Award, the George Tallman Ladd Research Award, the Okawa Foundation Research Award, the Li Ka Shing Foundation Women in Science Distinguished Lecture Series Award, and Best Paper Awards from top conferences.



Cynthia Sturton is an assistant professor in the Department of Computer Science at the University of Carolina at Chapel Hill. Her research is in computer security with a focus on applying formal methods to verify system-level software. Currently, she is focusing on verifying security properties of virtualization software (hypervisors, CPU emulators), and is investigating ways to make the use of traditional formal methods practical for these systems. She also works in hardware security with a focus on designing algorithms for detecting malicious hardware designs. In the past, she has worked on making electronic voting secure and practical.



Scott Tousley is the Deputy Director of the Cyber Security Division, a part of the DHS Science & Technology organization. He helps lead and manage a 30-person office and ~ \$75 million annual research portfolio focused on all aspects of cyber security, part of an interagency team that includes the National Science Foundation, Defense Advanced Research Projects Agency, National Security Agency, Intelligence Advanced Research Projects Agency, and the National Institute of Standards and Technology. Scott served 20 years as an Army officer in the Corps of Engineers, many of these years in interagency positions, including the head of a Watch/Warning Unit in the FBI as part of the National Infrastructure Protection Center, part of the Clinton Administration's early engagement with national cyber security challenges. His experience also includes managing the operations security team for a large Internet Service Provider, principal with a technology start-up company in the private sector, and program manager for MITRE support to the DHS National Cybersecurity Division. He has served seven years with DHS as both a support contractor and civil servant, principally with S&T but also the Domestic Nuclear Detection Office and several other elements of DHS.



Patrick Traynor is an Associate Professor in the College of Computing at Georgia Tech. His research focuses on the security of mobile systems, with a concentration on telecommunications infrastructure and mobile devices. His research has uncovered critical vulnerabilities in cellular networks, made the first characterization of mobile malware in provider networks and offers a robust approach to detecting and combatting Caller-ID scams. Traynor is also interested in Internet security and the systems challenges of applied cryptography. He received a CAREER Award from the National Science Foundation in 2010 and was named a Sloan Fellow in 2014. and was named a Sloan Fellow in 2014. Traynor earned the Ph.D. and M.S. in Computer Science and Engineering

from the Pennsylvania State University in 2008 and 2004, and the B.S. in Computer Science from the University of Richmond in 2002. He is currently a member of the Georgia Tech Information Security Center (GTISC) and a co-director of the Converging Infrastructure Security Laboratory (CISEC). He is also a co-founder of Pindrop Security.



Rebecca Wright is a professor in the Computer Science Department and Director of DIMACS at Rutgers. Earlier, she was a professor in the Computer Science Department at Stevens Institute of Technology and a researcher in the Secure Systems Research Department at AT&T Labs and AT&T Bell Labs. Her research spans the area of information security, including cryptography, privacy, foundations of computer security, and fault-tolerant distributed computing, as well as foundations of networking. Dr. Wright serves as an editor of the International Journal of Information and Computer Security and of the Transactions on Data Privacy. She is a member of the board of the Computer Research Association's Committee on the Status of Women in Computing Research (CRA-W), and was a member of the board of directors of the International Association for Cryptologic Research from 2001 to 2005. She was Program Chair of Financial Cryptography 2003 and the 2006 ACM Conference on Computer and Communications Security (CCS) and General Chair of Crypto 2002, and has also served on numerous program committees. She received a Ph.D. in Computer Science from Yale University, a B.A. from Columbia University, and an honorary M.E. from Stevens Institute of Technology.



Lenore D. Zuck is an Associate Professor in the Department of Computer Science at the University of Illinois at Chicago. Her research focuses on the application of formal methods for analysis and verification of secure software systems. In particular, she is interested in the application of advanced theorem proving techniques to the area of security, privacy, optimizing compilers, and policy analysis. She is also interested in ethical and secure data sharing across borders.