

Strengthening Data Science Methods for Department of Defense Personnel and Readiness Missions

Committee

Stephen M. Robinson

Chair

Stephen M. Robinson (NAE) is Professor Emeritus in the Department of Industrial and Systems Engineering at the University of Wisconsin-Madison. In 2008, he was elected as a member of NAE Section 8 - Industrial, Manufacturing, and Operational Systems Engineering. His research is in the development of quantitative methods for making the best use of scarce resources, which is part of the broad category of operations research methods. He works particularly on nonlinear and stochastic optimization methods for both optimization and equilibrium problems, trying both to develop the underlying theory and to find better numerical methods for solving applied problems. His recent work has focused especially on the mathematical properties of solutions of variational condition, considered as functions of the data appearing in those conditions. He has published 98 articles and recently finished a term as president of INFORMS. Dr. Robinson received his PhD in Computer Science from the University of Wisconsin-Madison in 1971.

Pascale Carayon

Member

Pascale Carayon is Procter & Gamble Bascom Professor in Total Quality in the Department of Industrial and Systems Engineering and the Director of the Center for Quality and Productivity Improvement (CQPI) at the University of Wisconsin-Madison. She leads the Systems Engineering Initiative for Patient Safety (SEIPS) at the University of Wisconsin-Madison. She received her engineering diploma from the École Centrale de Paris, France, in 1984, and her Ph.D. in Industrial Engineering from the University of Wisconsin-Madison in 1988. Her research in human factors and ergonomics focuses on macroergonomics and aims at modeling, assessing, and improving sociotechnical systems in order to enhance healthcare quality and patient safety. This research has been funded by the Agency for Healthcare Research and Quality, NSF, NIH, the National Institute for Occupational Safety and Health, DOD, the office of the National Coordinator for Health Information Technology, various foundations, and private industry. She is the co-editor-in-chief for Applied Ergonomics, and a member of the editorial boards of the Journal of Patient Safety, Behaviour and Information Technology, and Work and Stress. She is a Fellow of the Human Factors and Ergonomics Society (HFES) and the International Ergonomics Association (IEA). She is the Recipient of the IEA Triennial Distinguished Service Award (2012). Dr. Carayon is a member of the HFES Executive Council. She is the editor of the Handbook of Human Factors and Ergonomics in Health Care and Patient Safety.

David S. Chu

Member

David Chu serves as President of the Institute for Defense Analyses (IDA). IDA is a non-profit corporation operating in the public interest. Its three federally funded research and development centers provide objective analyses of national security issues and related national challenges, employing more than 1,000 scientists and technologists. Dr. Chu served in the DOD as Under Secretary of Defense for Personnel and Readiness from 2001-2009, and earlier as Assistant Secretary of Defense and Director for Program Analysis and Evaluation from 1981-1993. From 1978-1981 he was the Assistant Director of the Congressional Budget Office for National Security and International Affairs. Dr. Chu served in the U. S. Army from 1968-1970. He was an economist with the RAND Corporation from 1970-1978, director of RAND's Washington Office from 1994-1998, and vice president for its Army Research Division from 1998-2001. He earned his doctorate in economics, as well as a bachelor of arts in economics and mathematics, from Yale University. Dr. Chu is a member of the Defense Science Board and a Fellow of the National Academy of Public Administration. He is a recipient of the DOD Medal for Distinguished Public Service with Gold Palm, the Department of Veterans Affairs Meritorious Service Award, the Department of the Army Distinguished Civilian Service Award, the Department of the Navy Distinguished Public Service Award, and the National Academy of Public Administration's National Public Service Award.

Cynthia Dwork

Member

Cynthia Dwork (NAS/NAE) is a Distinguished Scientist at Microsoft Research. Dwork has made seminal contributions to cryptography and distributed computing. She invented differential privacy (with McSherry, Nissim, and Smith), cryptosystems whose security is based on worst-case analysis (with Ajtai), non-malleable cryptography (with Dolev and Naor), and computational-effort-based anti-spam techniques (with Naor). She was elected as a Fellow of the American Academy of Arts and Sciences (AAAS) in 2008. She received the Dijkstra Prize in 2007 for her work on consensus problems together with Nancy Lynch and Larry Stockmeyer. In 2009 she won the PET Award for Outstanding Research in Privacy Enhancing Technologies. Dwork received her B.S.E. from Princeton University in 1979, graduating Cum Laude, and receiving the Charles Ira Young Award for Excellence in Independent Research. She received her Ph.D. from Cornell University in 1983.

Terry Harrison

Member

Terry Harrison is a professor of Supply Chain and Information Systems, the Earl P. Strong Professor in Business, and the Director of the Sustainability Council in the Smeal College of Business at Pennsylvania State University. His teaching and research interests are in the areas of supply chain management and modeling, large-scale production and distribution systems, decision support systems, and applied optimization. He received a B.S. in Forest Science/Forest Products from Pennsylvania State University and a M.S. and Ph.D. in Management Science from the University of Tennessee.

Alan F. Karr

Member

Alan Karr is director of the Center of Excellence for Complex Data Analysis (CoDA) at RTI International. Dr. Karr is the former director of the National Institute of Statistical Sciences, located in Research Triangle Park, North Carolina. Karr was director for fourteen years and previously was assistant director from 1992 – 2000. He is also a professor of statistics and biostatistics at the University of North Carolina at Chapel Hill. He received his bachelor of science degree in industrial engineering from Northwestern University in 1969 with highest distinction. He continued at Northwestern University receiving his masters of science degree in industrial engineering in 1970 and his Ph.D. in Applied Mathematics in 1973. Karr spent roughly twenty years at Johns Hopkins University in the Mathematical Sciences Department, serving as chair from 1985-1986. He also served as associate dean, G.W.C. Whiting School of Engineering from 1986-1992. Dr. Karr has published over 110 scientific papers and written two books, Point Processes and their Statistical Inference and Probability. He is a contributing editor for the IMS Bulletin. He has also served on the Army Science Board and has been an associate editor for the Operations Research Letters, Mathematics of Operations Research, and the SIAM Journal on Applied Mathematics. He is also a fellow of the ASA, the Institute of Mathematical Sciences, and an elected member of the International Statistical Institute.

Sallie Keller

Member

Sallie Keller, Ph.D., is professor of statistics and director of the Social and Decision Analytics Laboratory within the Virginia Bioinformatics Institute at Virginia Tech. Formerly, she was professor of statistics and Academic Vice-President and Provost at University of Waterloo, director of the IDA Science and Technology Policy Institute, and professor of statistics and the William and Stephanie Sick Dean of Engineering at Rice University. Her other appointments include head of the Statistical Sciences group at Los Alamos National Laboratory, professor and director of graduate studies in the Department of Statistics at Kansas State University, and statistics program director at the National Science Foundation. Dr. Keller has served as a member of the National Academy of Sciences Board on Mathematical Sciences and Their Applications, has chaired the Committee on Applied and Theoretical Statistics, and is currently a member of the Committee on National Statistics. Her areas of expertise are social and decision informatics, the statistical underpinnings of data science, uncertainty quantification, and data access and confidentiality. She is a national associate of the National Academy of Sciences, fellow of the American Association for the Advancement of Science, elected member of the International Statistics Institute, and member of the JASON advisory group. She is also a fellow and past president of the American Statistical Association. She holds a Ph.D. in statistics from the Iowa State University of Science and Technology.

Alair MacLean

Member

Alair MacLean is associate professor of sociology at Washington State University, Vancouver. Her research focuses broadly on social inequality. She is currently exploring the life course trajectories of veterans who served in the U.S. armed forces, focusing on the effects of military service and combat exposure on work and health. She has published articles in the *Annual Review of Sociology*, *American Review of Sociology*, and the *Sociology of Education*. She is a member of the American Sociological Association, the Population Association of America, and the Inter-University Seminar on Armed Forces and Society. She is currently a member of the IOM Committee on the Initial Assessment of Readjustment Needs of Military Personnel, Veterans and their Families. She received an M.S. and Ph.D. in sociology from the University of Wisconsin-Madison and completed a postdoctoral fellowship at the Rand Corporation.

David Maier

Member

David Maier is Maseeh Professor of Emerging Technologies at Portland State University. Prior to his current position, he was on the faculty at SUNY-Stony Brook and Oregon Graduate Institute. He has spent extended visits with INRIA, University of Wisconsin-Madison, Microsoft Research, and the National University of Singapore, where he holds a part-time appointment. He is the author of books on relational databases, logic programming, and object-oriented databases, as well as papers in database theory, object-oriented technology, scientific databases, and dataspace management. He is a recognized expert on the challenges of large-scale data in the sciences. He received an NSF Young Investigator Award in 1984 and was awarded the 1997 SIGMOD Innovations Award for his contributions in objects and databases. He is an ACM Fellow and IEEE Senior Member. He holds a dual B.A. in Mathematics and in Computer Science from the University of Oregon (Honors College, 1974) and a Ph.D. in Electrical Engineering and Computer Science from Princeton University (1978).

Paul R. Sackett

Member

Paul R. Sackett is the Beverly and Richard Fink Distinguished Professor of Psychology and Liberal Arts at the University of Minnesota. His research interests revolve around various aspects of testing and assessment in workplace, military, and educational settings. His work on issues of fairness and bias in testing includes frequently cited 1994, 2001, and 2008 American Psychologist articles. He has long been active in the area of the assessment of honesty and integrity in the workplace. He also publishes extensively on the assessment of managerial potential and methodological issues in employee selection. He has worked with a wide variety of public and private-sector organizations on the design and evaluation of selection and training systems. He served as founding editor of the Society for Industrial and Organizational Psychology's (SIOP) journal Industrial and Organizational Psychology: Perspectives on Science and Practice, and editor of Personnel Psychology. He has served as president of SIOP, as co-chair of the Joint Committee on the Standards for Educational and Psychological Testing, as a member of the NRC's Board on Testing and Assessment, as chair of the American Psychological Association's (APA) Committee on Psychological Tests and Assessments, and as chair of APA's Board of Scientific Affairs. He received his Ph.D. in industrial and organizational psychology at the Ohio State University.

Mark S. Squillante

Member

Mark Squillante is a distinguished research staff member and manager in the mathematical sciences department at the IBM Thomas J. Watson Research Center, where he leads the Stochastic Processes and Optimization group. He received a Ph.D. degree from the University of Washington. He has been an adjunct faculty member at Columbia University and a member of the Technical Staff at Bell Laboratories, and has held visiting positions at various academic institutions. His research interests concern mathematical foundations of the analysis, modeling, and optimization of the design and control of complex systems under uncertainty, including stochastic processes, probability theory, stochastic optimization and control, mathematical statistics, queueing theory, algorithms, and stochastic resource allocation/scheduling, as well as their applications in the areas of decision making under uncertainty, business analytics and optimization, data analytics, smarter planet technologies, financial analytics, health analytics, smart energy/grid technologies, social media analytics, data-centric and cloud computing, computer systems, communication networks and mobile devices, revenue and risk management, and manufacturing and service operations management. He is an elected fellow of ACM and IEEE, and the author of more than 250 technical papers and more than 30 issued or filed patents. His work has been recognized through The Daniel H. Wagner Prize from INFORMS, eight best paper awards, 10 keynote/plenary presentations, 12 major IBM technical awards, and 26 IBM invention awards. He is a member of American Mathematical Society, the Bernoulli Society for Mathematical Statistics and Probability, IMS, INFORMS, and SIAM. He serves on the editorial board of ACM Transactions on Modeling and Computer Simulation and has chaired/organized several international conferences in applied probability and related applications.

William J. Strickland

Member

William J. Strickland is president and chief executive officer of the Human Resources Research Organization (HumRRO) in Alexandria, Virginia. Before his appointment as CEO, he spent over 10 years as a HumRRO vice president, directing its Workforce Analysis and Training Systems Division. Before joining HumRRO, he served in the United States Air Force and retired with the rank of colonel; in his last assignment, he was the director for Air Force human resources research. He is a fellow of the American Psychological Association (APA), past president of its Division of Military Psychology, and served for six years as that division's representative on the APA Council of Representatives. He currently serves as a member-at-large on the APA Board of Directors, and has represented APA on the Board of the Consortium of Social Science Organizations and on the Council of the Federation for Brain and Behavioral Sciences. He has been a member of four previous NRC committees. He is a graduate of the United States Air Force Academy and earned a Ph.D. in industrial and organizational psychology from Ohio State University.

Steven Tadelis

Member

Steven Tadelis is an associate professor of business and public policy at the Haas School of Business at the University of California, Berkeley. His research primarily revolves around e-commerce and the economics of the Internet. During the 2011-2013 academic years he was on leave at eBay research labs, where he hired and led a team of research economists. Their work focused on the economics of e-commerce, with particular attention to creating better matches of buyers and sellers, reducing market frictions by increasing trust and safety in eBay's marketplace, understanding the underlying value of different advertising and marketing strategies, and exploring the market benefits of different pricing structures. Aside from the economics of e-commerce, his main fields of interest are the economics of incentives and organizations, industrial organization, and microeconomics. Some of his past research aspired to advance our understanding of the roles played by two central institutions—firms and contractual agreements—and how these institutions facilitate the creation of value. Within this broader framework, he has explored firm reputation as a valuable, tradable asset; the effects of contract design and organizational form on firm behavior with applications to outsourcing and privatization; public and private sector procurement and award mechanisms; and the determinants of trust. He received a Ph.D. in economics from Harvard University, a M.Sc. in economics from the Technion in Israel, and a B.A. in economics from the University of Haifa in Israel.

Michelle Schwalbe

Staff Officer