

The Federation of Behavioral, Psychological, and Cognitive Sciences
and
the Human Factors and Ergonomics Society

Science Forum on

**Human Factors Research and Homeland Security:
Current and Future Applications**

11.17.05

Speaker Information

Wendy A. Rogers, PhD

Wendy A. Rogers is Professor in the School of Psychology at Georgia Institute of Technology. Her research interests include skill acquisition, human factors, training, and cognitive aging. She is the Co-Director of the Human Factors and Aging Laboratory (www.hfaging.org) which is funded by the National Institutes of Health (National Institute on Aging) as part of the Center for Research and Education on Aging and Technology Enhancement (www.create-center.org), and by a National Science Foundation grant entitled "The Aware Home: Sustaining the Quality of Life for an Aging Population" (www.awarehome.gatech.edu). She is the immediate Past President of the Human Factors and Ergonomics Society (www.hfes.org).

Nancy J. Cooke, PhD

Nancy J. Cooke is a professor of Applied Psychology at Arizona State University and is Science Director of the Cognitive Engineering Research Institute in Mesa, AZ. She is also Editor-in-Chief of *Human Factors*. Dr. Cooke received a B.A. in psychology from George Mason University and received her M.A. and Ph.D. in cognitive psychology in 1983 and 1987, respectively from New Mexico State University. Currently, she supervises graduate and undergraduate research in the Cognitive Engineering Research on Team Tasks Laboratory. Her research interests include the study of knowledge and its application to the development of cognitive and knowledge engineering methodologies, as well as to expertise, intelligent tutors, human-computer interfaces, homeland security systems, and team performance. In particular, Dr. Cooke specializes in the development, application, and evaluation of methodologies to elicit and assess individual and team cognition. Her most recent work includes empirical and modeling efforts to understand the acquisition and retention of team skill and the measurement of team coordination and team situation awareness especially through the analysis of communication. Her work has been applied to unmanned aerial vehicle ground control and emergency response.

Thomas F. Sanquist, PhD

Dr. Sanquist is a staff research scientist in the National Security Division of the Pacific Northwest National Laboratory, operated by Battelle for the US Department of Energy. He is trained as an experimental psychologist, with a BA degree from the University of Michigan, and MA and PhD degrees from the University of California, Los Angeles. Dr. Sanquist is a researcher-practitioner in human factors, working in the transportation and national security domains. He has developed a specialty in fatigue research in round-the-clock operations, as well as more recently focusing on human factors in homeland security systems. This latter work involves implementing radiation screening technologies at border crossings, and development of threat display techniques to reduce operator workload. Dr. Sanquist is currently serving on a National Research Council panel to develop a process for Human-Systems Integration for new technologies.

Peter Hancock, PhD

Peter Hancock is Provost Distinguished Research Professor in the Department of Psychology, the Institute for Simulation and Training, and at the Department of Civil and Environmental Engineering at the University of Central Florida. In his previous appointment, he founded and was the Director of the Human Factors Research Laboratory at the University of Minnesota. At Minnesota he held appointments as Full Professor in the Departments of Computer Science and Electrical Engineering, Mechanical Engineering, Psychology, and Kinesiology as well as at the Cognitive Science Center and the Center on Aging Research. He currently holds a courtesy appointment as a Research Scientist

at the Massachusetts Institute of Technology (MIT) and as an Adjunct Senior Research Scientist at the Transportation Institute of the University of Michigan. Professor Hancock is the author of over four hundred refereed scientific articles and publications as well as editing numerous books including: *Human Performance and Ergonomics in the Handbook of Perception and Cognition* series, published by Academic Press in 1999 and *Stress, Workload, and Fatigue*, published in 2001 by Lawrence Erlbaum. He is the author of the 1997 book, *Essays on the Future of Human-Machine Systems*. He has been continuously funded by extramural sources for every year of his professional career, including support from NASA, NIH, NIA, FAA, FHWA, the US Navy and the US Army as well as numerous State and Industrial agencies. He is the Principal Investigator on the recently awarded Multi-Disciplinary University Research Initiative, in which he will oversee \$5 Million of funded research on stress, workload, and performance. He has been elected to a three-year term as a Member of the National Research Council's Committee on Human Factors and which will run concurrently with his membership of the Executive Council of the Human Factors and Ergonomic Society. His current experimental work concerns the evaluation of behavioral response to high-stress conditions. His theoretical works concerns human relations with technology and the possible futures of this symbiosis. He is a Fellow of and past President of the Human Factors and Ergonomics Society. He collects and studies antique maps and is a committed Ricardian.

Gary Klein, PhD

Gary Klein is Chief Scientist of Klein Associates, a group he formed in 1978 to better understand how to improve decision making in individuals and teams. The Klein Associates Division (now a part of Applied Research Associates) has more than 35 employees working on projects for government (e.g., Army, Navy, Air Force, Marines) and commercial clients (e.g., Mead Johnson, Kodak, McKinsey, and Procter & Gamble). Dr. Klein is one of the founders of the field of Naturalistic Decision Making. His work on recognitional decision-making has been influential for the design of new systems and interfaces, and for the development of decision training programs. He has extended his work on decision making to describe problem detection, option generation, sensemaking, planning and replanning. In order to perform research on decision-making in field settings, Dr. Klein and his colleagues have developed new methods of Cognitive Task Analysis. Klein Associates has used Cognitive Task Analysis methods to study decision making in more than 60 domains, including firefighting, command and control, software troubleshooting, healthcare, and consumer purchasing. Dr. Klein has presented workshops on Cognitive Task Analysis and on Decision Skills Training to a wide variety of professionals in the U.S. and abroad.

Dr. Klein received his Ph.D. in experimental psychology from the University of Pittsburgh in 1969. He was an Assistant Professor of Psychology at Oakland University (1970-1974) and worked as a research psychologist for the U.S. Air Force (1974-1978). He has written more than 70 papers and co-edited three books. He is the author of *Sources of Power: How People Make Decisions* (1998, MIT Press), which has sold more than 20,000 copies and has been translated into four languages, and *The Power of Intuition* (2004, A Currency Book/Doubleday). His next book, "Working Minds: A practitioner's guide to Cognitive Task Analysis" (Crandall, Klein and Hoffman) will be published by MIT Press in the Spring, 2006.

Mary (Missy) Cummings, PhD

Missy Cummings received her B.S. in Mathematics from the United States Naval Academy in 1988, her M.S. in Space Systems Engineering from the Naval Postgraduate School in 1994, and her Ph.D. in Systems Engineering from the University of Virginia in 2003. A naval officer and military pilot from 1988-1999, she was one of the Navy's first female fighter pilots. She is currently an assistant professor in the Aeronautics & Astronautics Department at the Massachusetts Institute of Technology. Her previous teaching experience includes instructing for the U.S. Navy at Pennsylvania State University and as an assistant professor for the Virginia Tech Engineering Fundamentals Division. Her research interests include human supervisory control, human-unmanned vehicle interaction, bounded collaborative human-computer decision making, decision support, information complexity in displays, and the ethical and social impact of technology.

Joshua Rubinstein, PhD

Dr. Rubinstein received a BA in Psychology from Swarthmore College in 1984, an MA in Cognitive Psychology from the University of Illinois in 1989, and a Ph.D. in Experimental Psychology from the University of Michigan in 1993. His research focused on learning, human categorization, human attention, and neuropsychology. His dissertation examined cognitive processes involved during attentional task switching (published in *Journal of Experimental Psychology: HPP*, 2001). Dr. Rubinstein conducted further research on executive control processes as a post-doctoral research fellow at the Center for Neuroscience at the University of California, Davis

In 1998, Dr. Rubinstein began working for Federal Data Corporation, supporting air traffic control, airways facilities, and aviation security research. He soon joined the FAA's Aviation Security Laboratory's Human Factors Program in May 2000 as an Engineering Research Psychologist. There, he developed the X-ray Screener Selection Test (called SORT), currently used by TSA as the sole X-ray aptitude test during screener hiring. One of his primary responsibilities became that of technical monitor of human factors long-term research. Starting in 2001, he developed a program for funding academic scientists in the areas of attention, target detection, object recognition, training, learning, and fatigue as they relate to the X-ray screener task. This program is currently funding several research programs, pursuing a long-term agenda for developing a theoretical understanding of applied cognitive processes. Other research includes usability analyses, training development, and studies designed to uncover the differences between good and poor X-ray screeners. The lab has recently become the Transportation Security Laboratory, under the Department of Homeland Security, Science and Technology Directorate.

Elizabeth L. Grossman, PhD

Elizabeth L. Grossman is the Staff Director of the Research Subcommittee of the House Committee on Science, which has oversight responsibilities for the National Science Foundation and homeland security research and development programs, including cybersecurity. Before joining the Committee, she spent six years at the National Academy of Sciences where she worked on a variety of studies on science, technology, and public policy. She holds a B.A. in physics and mathematics from Swarthmore College and a Ph.D. in computational physics from the University of Chicago.

William Grosshandler, PhD

Dr. Grosshandler is the Chief of the Fire Research Division in the Building and Fire Research Laboratory (BFRL) of the National Institute of Standards and Technology. His responsibilities and technical areas of interest include fire dynamics, sensing of fires, mechanisms of fire suppression, fire retarded polymers, and advanced fire service technologies. He led the technical investigation into The Station nightclub fire and is the associate lead investigator of the National Building and Fire Safety Investigation of the World Trade Center Disaster. Dr. Grosshandler also manages BFRL's longer term research to reduce the impact of extreme threats to the safety of buildings, their occupants and emergency responders.

Dr. Grosshandler received his PhD. in Mechanical Engineering from the University of California, Berkeley. Prior to his appointment at NIST, he spent three years as the Director of the Thermal Systems Program of NSF. At the same time, he maintained his position as Professor of Mechanical and Materials Engineering at Washington State University, where he had been since 1976. He has also held visiting appointments at Factory Mutual Research Corporation and the University of Poitiers in France. Dr. Grosshandler has served on the Board of Directors of the Combustion Institute, was a member of the editorial advisory board of *Progress in Energy and Combustion Science*, is a Fellow of ASME, and is a recipient of the U.S. Department of Commerce Silver Medal and Gold Medal Awards.

Paul (Wyn) Jennings, PhD

Dr. Jennings received his advanced degrees in Chemistry at the University of Colorado, the University of Utah and Caltech. He has been a Professor of Chemistry at Montana State University concentrating on Organometallic Chemistry, Medical Aspects of Organometallic compounds and Composite Materials. Since 1994, he has been a Program Director at the National Science Foundation and for the last two years on Detail to the University Programs Office within the S&T complex of the Department of Homeland Security. While on Detail, he has help establish 4 Centers of Excellence and was a liaison between NSF and DHS.