

Energy Challenges and Opportunities for Future Data-Driven Operations in the United States Air Force

Committee

Julie J. Ryan

Chair

Julie J.C.H. Ryan is the Chief Executive Officer at Wyndrose Technical Group. Dr. Ryan was previously professor for systems management at the National Defense University, was a visiting scholar for the National Institute of Standards and Technology (NIST); associate professor of engineering management and systems engineering, 2009-2016, and department chair, 2010-2012 at George Washington University. She holds a B.S. degree in humanities from the U.S. Air Force Academy, M.L.S. in technology from Eastern Michigan University, and D.Sc. in engineering management from the George Washington University. Dr. Ryan began her career as an intelligence officer, serving the U.S. Air Force and the U.S. Defense Intelligence Agency (DIA), working a series of increasingly responsible positions throughout her distinguished career. Her areas of interest are in information security and information warfare research.

Mark Costello

Member

Mark F. Costello is the William R. T. Oakes Professor and Chair of the School of Aerospace Engineering at Georgia Tech, where he is responsible for leadership of the school, as well as all administration and financial management of the department. Previously, he was posted at the Tactical Technology Office at the Defense Advanced Research Projects Agency (DARPA), where he served as a program manager. Prior to joining DARPA, Dr. Costello served as the David Lewis Professor of Autonomy in the Schools of Aerospace Engineering and Mechanical Engineering at Georgia Tech, where he taught the areas of dynamics, controls, and design. His research team is noted for creating innovative new technologies, such as robotic landing gear for rotorcraft, bleed air control of parafoils, and direct impact control of smart projectiles. This research has led to formation of start-up companies. He founded and serves as the CEO of Earthly Dynamics Corporation, a company that develops and fields new guided airdrop system technology. He also co-founded the Persimia Corporation that provides web-based environmental impact assessment analysis tools for wind energy system installations. Dr. Costello received his B.S. in aerospace engineering from Pennsylvania State University, and his M.S. and Ph.D. in aerospace engineering from the Georgia Institute of Technology.

John Ferrari

Member

John Ferrari (Major General, U.S. Army, retired) is currently Chief Administrative Officer at QOMPLX, a startup company focused on democratizing advanced data science methodologies and massively scalable analytics that until now have been restricted to only the largest corporations. Mr. Ferrari joined QOMPLX after a 32-year career in the U.S. Army, having retired as a Major General in 2019. Over the course of his military career, he ran business operations, implemented data analytics, and executed financial management activities within the Department of Defense. Mr. Ferrari's operational experiences include Operation Desert Storm, Operation Iraqi Freedom, and Operation Enduring Freedom. He has served in various U.S. Cavalry units including the 2nd and 3rd Cavalry. Mr. Ferrari has extensive institutional experience including Army Materiel Command, White Sands Missile Range, the Executive Office of the President, the Joint Staff, and the Army Staff. His last assignment in the Army was as the Director of Program Analysis and Evaluations, where he oversaw the strategic resources of the Army, as well as led the Army's operations research systems analysis functional area.

Deniz Ozkan

Member

Deniz Ozkan is the Americas Valuation Lead at Shell New Energies Offshore Wind Team and currently working on the Mayflower Offshore Wind Project in Massachusetts. She is an energy investment analysis expert with an extensive technical knowledge. Before joining Shell, she was the Director of Analysis, Research and Systems Engineering of Atlantic Grid Development, an offshore transmission development project, where she was leading techno-economic studies including the system design optimization and investment analysis. She has a Ph.D. in Engineering Management/Economics, Finance and Cost Engineering from The George Washington University where she taught engineering economy courses for six years. She has conducted more than 13 years of research in the fields of renewable energy, power markets, transmission planning and integrated system analysis and written articles and technical reports on the integrated design of energy systems, including her dissertation, Financial Analysis and Cost Optimization of Offshore Wind Energy under Uncertainty and in Deregulated Power Markets.

Marcus Sachs

Member

Marcus (Marc) Sachs is the Chief Security Officer of Pattern Computer, a startup in the machine learning and artificial intelligence field, where he is responsible for overall corporate security policy and strategy. He is also a partner at RIDGE-LANE Limited Partners in the Technology Practice. Mr. Sachs retired from the United States Army after serving a distinguished 20-year career as a Corps of Engineers and Systems Automation Officer. His final assignment was with the Department of Defense's Joint Task Force on Computer Network Defense (JTF-CND), established in 1998 to defend the department's computer networks from foreign intrusions. Following his military retirement, he was appointed by President George W. Bush to serve concurrently on the staff of the National Security Council and on the staff of the President's Critical Infrastructure Protection Board. Mr. Sachs later joined the National Cyber Security Division of the U.S. Department of Homeland Security (DHS) as the department's first Cyber Director, where he was responsible for developing the implementation plan for the National Strategy to Secure Cyberspace. While at the White House and DHS, he proposed and developed the concept and early design for the United States Computer Emergency Response Team (US-CERT). Since leaving military and public service, Mr. Sachs' private sector experience includes serving as the deputy director of SRI International's Computer Science laboratory, as the vice president for national security policy at Verizon Communications, and as the senior vice president and chief security officer of the North American Electric Reliability Corporation (NERC), where he directed the rebuilding of the Electricity Information Sharing and Analysis Center (E-ISAC). Mr. Sachs was the director of the SysAdmin, Audit, Network, Security (SANS) Internet Storm Center from 2003-2010 and has co-authored several books on information security. He holds degrees in civil engineering, computer science, and technology.

Michael Schneider

Member

Michael Schneider is Group Leader in astronomy and astrophysics analytics at the Lawrence Livermore National Laboratory (LLNL). He possesses over ten years of experience in the applications of statistical and numerical methods to the analysis of large data sets. He wrote his Ph.D. thesis on simulation frameworks for the future Large Synoptic Survey Telescope (LSST) under the direction of the founding director of the project. He moved to a post-doctoral position in the United Kingdom in 2008 working on simulations of galaxy formation on high-performance computing resources for application to the Pan-STARRS 1 sky survey. He then moved back to the U.S. in 2010 to start a science program in dark energy at LLNL targeted for the LSST. Over the past nine years at LLNL, Dr. Schneider has built a new team at the lab in data analytics for astronomy. He now also leads a large interdisciplinary research team at LLNL focused on development of novel machine learning and quantum computing algorithms. Dr. Schneider has served on a variety of U.S. government agency review teams to help plan the next generation of data exploitation approaches for upcoming synoptic sky surveys. From 2015-2018 he led the Weak Gravitational Lensing working group in the LSST Dark Energy Science Collaboration. At LLNL, he now serves on the Data Science Institute Governing Council. Dr. Schneider earned his B.S. in physics from the University of Illinois Urbana-Champaign and his Ph.D. in physics from the University of California, Davis.

Subhash C. Singhal

Member

Subhash Singhal (NAE) retired as a Battelle Fellow and director, Fuel Cells at Pacific Northwest National Laboratory (PNNL) in 2013. From 2000 to 2013 he provided senior technical, managerial, and commercialization leadership to the laboratory's extensive fuel cell and clean energy programs. Previously, he worked for over 29 years, initially as a scientist and later as manager, fuel Cell Technology at the Westinghouse Electric Corporation. While at Westinghouse, which became part of Siemens, he conducted and/or managed major research, development, and demonstration programs on advanced materials and energy systems including steam and gas turbines, coal gasification, and fuel cells. From 1984 to 2000, as Manager of Fuel Cell Technology, he was responsible for the development of solid oxide fuel cells for stationary power generation. In this role, he led an internationally recognized group in fuel cell technology and brought these cells from a few-watt laboratory curiosity to fully-integrated 200 kilowatt (kW) size power generation systems. He has authored 100 scientific publications, edited 21 books, received 13 patents, and given over 340 plenary, keynote, and invited presentations worldwide. Dr. Singhal is the recognized world leader in solid oxide fuel cells for power generation. He has served on the advisory boards of the Department of Materials Science and Engineering at the University of Florida, Florida Institute for Sustainable Energy, Division of Materials Science and Engineering at Boston University, Materials Research Science and Engineering Center at the University of Maryland, Center on Nanostructuring for Efficient Energy Conversion at Stanford University, and the Fuel Cell Institute at the National University of Malaysia. Dr. Singhal is a member of the U.S. National Academy of Engineering; a founding member and past president of the Washington State Academy of Sciences; a fellow of the American Ceramic Society, the Electrochemical Society.

Ryan Murphy

Staff Officer