

Coast Guard Maritime Domain Awareness

Committee

Heidi C. Perry

Chair

Heidi C. Perry, Chair, is currently Principal Staff for the Division Office for Air, Missile & Maritime Defense Technology at the Massachusetts Institute of Technology Lincoln Laboratory. In her role, she works strategic initiatives for undersea systems and serves as the chief innovation officer for the division. Previously, Ms. Perry was Director, System Engineering, at the Charles S. Draper Laboratory, Incorporated. She also served in other senior leadership roles, including Director, Algorithms & Software and Director, Internal R&D Portfolio. Her expertise includes guidance, navigation, and control; global position system anti-jam and ground control; autonomous systems; mission-critical software; and command, control, communications, computers, intelligence, surveillance, and reconnaissance systems. Ms. Perry began her career with General Electric as a systems engineer working on the AN/BSY-2 Sonar System before moving to IBM, as a systems engineer for avionics design and flight test programs. From IBM she moved to Draper Laboratory as task leader for the Dolphin Navigation System Upgrade and remained with Draper for over 20 years. In these years at the laboratory, she served as technical director for various research and development programs involving autonomous spacecraft, aircraft, robotics systems, and underwater vehicles. A member of the Institute of Electrical and Electronic Engineers and the American Institute of Aeronautics and Astronautics (AIAA), she was named AIAA Software Engineer of the Year 2004—New England Sector. A former member of the Naval Studies Board (2008-2013), she also served on the National Academies' Committee on Capability Surprise for U.S. Naval Forces, Committee on National Security Implications of Climate Change on U.S. Naval Forces, and Committee on the "1,000 Ship Navy"—A Distributed and Global Maritime Network. Most recently, she served as the co-chair of the National Academies' Committee on Mainstreaming Unmanned Undersea Vehicles into Future U.S. Naval Operations. She has also served as the chair for the Transportation Research Board's Committee for Review of the National Naval Responsibility for Naval Engineering Program. She received a B.S. in electrical engineering from Cornell University and an M.S. in computer engineering from the National Technical University. She currently serves as a member of the President's Council of Cornell Women.

Thomas J. Eccles, USN

Member

RADM Thomas J. Eccles (NAE) is the Chief Executive Officer of Trident Maritime Systems, LLC. He served for more than 30 years in the U.S. Navy, retiring in 2013 as Chief Engineer for ships, submarines, aircraft carriers and their weapons and systems. His fields of expertise include naval operations and engineering, submarines, deep sea diving, and salvage operations. RADM Eccles led submarine design and construction programs and was responsible for research and development submarines, submarine escape and rescue systems, and atmospheric diving systems. His flag officer assignments included Deputy Commander for Undersea Warfare and Undersea Technology in NAVSEA, and Commander of the Naval Undersea Warfare Center, before becoming NAVSEA's Chief Engineer in September 2008. He is member of the Marine Board of the National Academies and previously served on the National Academies Committee on the Analysis of Causes of the Deepwater Horizon Explosion, Fire, and Oil Spill to Identify Measures to Prevent Similar Accidents in the Future. RADM Eccles earned a B.S. in Electrical Engineering, M.S. in Mechanical Engineering, the Naval Engineer degree, and M.S. in Management of Technology from the Massachusetts Institute of Technology.

Jaye Falls

Member

Jaye Falls is an Assistant Professor in the Department of Naval Architecture and Ocean Engineering at the U.S. Naval Academy. She previously served as a consultant to the Oracle BMW Racing Team for the 2003 America's Cup, supporting the design and structural analysis of the racing yacht hull, mast, and appendages. She also worked as Senior Engineer in the Proteus Engineering Division at Anteon Corporation performing ship design and analysis for monohull, multihull, and submarine vessels. Prior to working for Anteon, she worked as a Naval Architect at the Naval Surface Warfare Center, Carderock Division. She served on the National Academies Study to Update Coast Guard Vessel Stability Standards. Dr. Falls earned a Ph.D. in aerospace engineering from the University of Maryland, College Park; an M.S. in ocean engineering from the Massachusetts Institute of Technology; and a B.S. in naval architecture and marine engineering from the Webb Institute of Naval Architecture.

Barry M. Horowitz

Member

Barry M. Horowitz (NAE) joined the University of Virginia's faculty as a Professor in the Systems and Information Engineering Department in September 2001, after a research and industrial career involving the application of systems engineering to many large and complex systems. He assumed the role of Department Chair in 2009. Since joining the university he has focused his research efforts on wireless systems, and a systems engineering approach for addressing cybersecurity. From 2006 to 2013 he served as the UVA research site director for the National Science Foundation sponsored Industry/University Cooperative Research Center (I/U CRC) called WICAT (Wireless Internet Center for Advanced Technology) and in 2013 led the UVA effort to create a new NSF I/U CRC called BWAC (Broadband Wireless Access and Applications Center). He leads a DOD-sponsored research project on embedding security solutions into systems, referred to as System Aware Cyber Security. The project includes work on cybersecurity for airborne surveillance systems onboard unmanned vehicles. From 1969 through 1996 he was employed in a variety of positions at the MITRE Corporation, including the last five years as President and CEO. He chaired and served on numerous National Academies committees, including the Naval Studies Board. Dr. Horowitz earned a B.S. from City College of New York, M.S. from New York University, and a Ph.D. from New York University, all in electrical engineering.

Lauren J. Kessler

Member

Lauren J. Kessler is a Distinguished Member of the Technical Staff at the Charles S. Draper Laboratory, where she has led the Intelligent Automated Systems and the Resilience and Fault Tolerance groups. She has been a key contributor to the laboratory's unmanned underwater vehicle (UUV) efforts, focused on the human operator engagement with the autonomous vehicles. She was the software systems safety lead for the autonomous path and mission planning system and led projects on automated hydrocarbon extraction rigs, lunar surface systems autonomy software architectures, and autonomous precision lunar landing mission management. She is currently working on the fault tolerant flight computer software development for the DreamChaser unmanned spacecraft. Previously, she was a lead engineer at Northstar and Avidyne for the development and certification of a general aviation next generation Air Data/Attitude/Heading Reference System and a precision approach navigation device for the GPS-Wide Area Augmentation System. Her areas of expertise center on human-in-the-loop and mission-critical systems, including war-gaming simulations, human-embedded autonomous systems, avionics, and human decision aides. She is a commercially rated helicopter pilot, advanced aviation ground instructor, and serves on the Civil Air Patrol in Massachusetts and on the University of Colorado Aerospace Engineering Sciences External Advisory Board. She earned an M.S. from Brown University.

Annette J. Krygiel

Member

Annette J. Krygiel served 38 years in Department of Defense (DOD) organizations with missions in mapping and imagery, starting in the Aeronautical Chart and Information Center, and later in the Defense Mapping Agency (DMA), Central Imagery Office, and the National Geospatial-Intelligence Agency. Her assignments spanned management and development of geodetic and gravimetric programs, telecommunications applications for mapping, and the management of large-scale computer systems. She was a program manager for the DMA Digital Production System through its critical design, development, and delivery stages. This was one of DOD's largest software developments, providing DMA the capability to transform the mapping and charting process with revolutionary digital technologies to meet advancing requirements. She summarized lessons learned on large-scale systems' integration in her book, *Behind the Wizard's Curtain: An Integration Environment for a System of Systems*, published by the DOD's Command and Control Research Program in collaboration with the National Defense University. Dr. Krygiel served on the National Academies' Naval Studies Board for six years. She earned a Ph.D. in computer sciences from Washington University.

Fred M. Midgette

Member

VADM Fred M. Midgette retired from the US Coast Guard in 2018 after serving as Commander of the Pacific Area. In this capacity, he served as the operational commander for all Coast Guard missions within half of the world that spans from the Rocky Mountains to the waters off the East Coast of Africa. He previously served as Deputy Commandant for Operations where he was responsible for developing operational strategy, policy, guidance, and resources that address national priorities. From 2014 - 2015 he served in the Great Lakes as the Ninth Coast Guard District Commander. He has also commanded four Coast Guard cutters and served afloat on the CGC TANEY (Portsmouth, VA); USS FIFE (San Diego, CA); CGC POINT LEDGE (Fort Bragg, CA); CGC POINT WINSLOW (Eureka & Morro Bay, CA); CGC KATMAI BAY (Sault Ste. Marie, MI); CGC HARRIET LANE (Portsmouth, VA); CGC FORWARD (Portsmouth, VA); and America's Tall Ship - the Coast Guard Barque EAGLE (New London, CT). He is the 14th Gold Ancient Mariner of the Coast Guard, which is an honorary position held by an officer with over 10 years of cumulative sea duty who has held the qualification as a Cutterman longer than any other officer. He earned a B.S. in civil engineering from the U.S. Coast Guard Academy, M.S. in Management from Rensselaer Polytechnic Institute, and M.A. in National Security and Strategic Studies from the U.S. Naval War College.

Matthew Pickett

Member

CDR Matthew Pickett is the cofounder and the President of Oceans Unmanned, a nonprofit organization with a mission to facilitate the use of unmanned technologies for environmental research and monitoring. He retired in 2016 from the National Oceanographic and Atmospheric Administration (NOAA) as Commander after serving 27 years, providing operational support for NOAA oceanographic and atmospheric research missions aboard ships, small boats, aircraft, and SCUBA diving. His NOAA career included four years as the Chief of the Remote Sensing Division Flight Branch and three years as the Superintendent of the Channel Islands National Marine Sanctuary. His aviation experience consists of multiple FAA ratings including an Airline Transport Pilot, seaplane rating, and Remote Pilot Certificate. He earned a B.S. in mechanical engineering from West Virginia University.

Sean T. Pribyl

Member

Sean T. Pribyl is Lawyer and Senior Claims Executive with Gard AS P&I Club in Arendal, Norway, where he advises on legal matters related to marine incidents and serves on Gard's autonomous systems workgroup. Most recently, he was an attorney with Blank Rome LLP in Washington, D.C, with a practice focused on maritime international law, unmanned systems, and environmental and regulatory compliance. He was the co-leader of Blank Rome's Unmanned Systems-Drones Industry Group and advised clients on issues such as the use of unmanned systems in domestic and international airspace. He is a widely published author and a regular speaker on unmanned and autonomous systems. He contributed the chapter on "Regulating Drones in Maritime and Energy Sectors" to the Handbook of Unmanned Aerial Vehicles. His article "Drones - Is the Maritime Industry Ready?" was featured on the July 2016 cover of Maritime Reporter. He is the former Chair for Regulations-Policy-Legal Issues at the International Conference on Unmanned Aircraft Systems and served for six years as a USCG judge advocate where he was an attorney-advisor to USCG UAS/UAV programs on international and maritime legal and policy matters. He is a licensed mariner (Deck Officer) and served aboard commercial ships for eight years. He is a member of the National Academies' Marine Board. He earned a J.D. from Washburn University of Topeka.

Charles E. Thorpe

Member

Charles E. Thorpe is Dean of Arts and Sciences, Clarkson University. Prior to being appointed Dean, he served a five-year term as the university's Sr. VP and Provost from 2012 to 2017. He spent the bulk of his career with the Carnegie Mellon University Robotics Institute (from 1979 to 2012), including the Director of the Institute. The institute's Navlab group built a self-driving car in 1989; drove autonomously across the US in 1995, and contributed to both DOD (Autonomous Land Vehicle) and DOT automation programs and projects (Automated Highway Demonstration and Single Vehicle Roadway Departure Countermeasures). He continues as an Adjunct Professor of Robotics with Carnegie Mellon. He has over 120 refereed publications in robotics. Dr. Thorpe has often been called to serve on scientific or advisory committees; he has served on four different studies for the National Academies, as well as national and international advisory committees. Dr. Thorpe earned a Ph.D. in computer sciences from Carnegie Mellon University.