

Assessment of the National Institute of Standards and Technology (NIST) Engineering Laboratory (EL)

Committee

Joseph J. Beaman, Jr.

Chair

JOSEPH J. BEAMAN (NAE) is currently the Earnest F Gloyna Endowed Professor in Engineering in the Mechanical Engineering Dept at the University of Texas at Austin. His career work has been in both manufacturing and control. His specific manufacturing research interest is in Additive Manufacturing (AM). Professor Beaman was the first academic researcher in the field. One of the most successful AM approaches, Selective Laser Sintering, was a process that was developed in his laboratory. Dr. Beaman is a Fellow of both ASME and SME, elected to the National Academy of Engineers in 2013, elected National Academy of Inventors in 2015, elected Distinguished Engineering Graduate, Cockrell School of Engineering, The University of Texas at Austin (2015), received the SME Albert M. Sargent Award in 2016, the SM Wu Implementation Award from NAMRI/SME in 2018, received the CIRP Nicolau award August 2021 at the CIRP General Assembly, and elected Honorary Member of ASME in 2023. He joined the ME faculty at the University of Texas in 1979 after receiving his Sc.D. from the Massachusetts Institute of Technology in Mechanical Engineering. Professor Beaman was the Chair of the Department of Mechanical Engineering from 2001 - 2012 and was the Director Advanced Manufacturing & Design Center from 2012 - 2020 at the University of Texas. He was elected and served on the Society of Manufacturing Board of Directors, SME (2012-2014) and nominated and appointed US Army Science Board, US Army (2012-2015). His most recent research publications include additive manufacturing carbon fiber reinforcement, data driven control for laser powder bed fusion, the first investigation of selective laser flash sintering for ceramic parts, the design of in-situ microscope for selective laser sintering processes, and multi-material AM (2022 - 2023)

Veronica Adetola

Member

VERONICA ADETOLA is the Chief Research Scientist at Pacific Northwest National Laboratory, where she leads the Resilient Control Methods Team and oversees multi-million-dollar projects to develop methods and algorithms for enhancing the efficiency, reliability, and resiliency of energy systems. Her expertise includes model-based and data-driven control methods and optimization, with specific applications in building and energy management systems, buildings-to-grid interaction, and distributed energy resources. Before joining PNNL in 2019, Dr. Adetola made significant contributions at the United Technologies Research Center (now Raytheon Technologies). During her tenure, she successfully led efforts for multiple UTC businesses and government-funded research programs. In recognition of her accomplishments, she received several awards, including the 2013 Outstanding Achievement Award from the research center for her work on developing, demonstrating, and transitioning model-based control technologies to UTC businesses. Dr. Adetola's accolades also include the prestigious ASHRAE Science and Technology Best Paper Award for her research on Fault-Tolerant Optimal Control of a Building HVAC System and the IFAC prize for the Best Methodology/Theory Paper in the Journal of Process Control for her work on integrating real-time optimization and model predictive control. Dr. Adetola has served as a peer reviewer for the Department of Energy (DOE) Building Technology Office (BTO)-funded projects in 2018. She also contributed to the BTO Grid-interactive Efficient Buildings technical report series on Whole-Building Controls, Sensors, Modeling, and Analytics in 2020. Dr. Adetola was a Board of Governors member of the IEEE Control Systems Society (CSS) in 2019 and currently serves as Associate Editor for IEEE Transactions on Control Systems Technology and Vice Chair for the CSS Technical Committee on Energy Systems. Dr. Adetola has a Ph.D. in Chemical Engineering (Control Systems) from Queen's University, Ontario, Canada. She holds 10 U.S. granted patents and has authored a book, three book chapters, over 50 journal publications and peer-reviewed conference papers.

Somayeh Asadi

Member

SOMAYEH ASADI is currently a professor in the Department of Civil and Environmental Engineering at the University of Virginia. Before that, she was an Associate Professor at Pennsylvania State University. She leads a diverse research group to advance smart, connected buildings and cities. Her research group's work focuses on studying the performance of buildings, building systems, and occupant behavior to improve the energy performance, efficiency, and energy demand contributions of the built environment. She is a member of the American Society of Civil Engineering. Dr. Asadi received her Ph.D. in Engineering Science from Louisiana State University in 2012. Her research efforts have resulted in more than 200 peer-reviewed journal articles, book chapters, books, and 60 peer-reviewed conference papers.

Ashley Gaulding

Member

ASHLEY GAULDING is a research scientist at NREL, working in the field of photovoltaics for over a decade. She leads projects in the areas of PV reliability and degradation, and PV circularity (design, reuse, recycling). She is the leader of the international Photovoltaic Quality Assurance Task Force (PVQAT) task group 15, which focuses on “Repair, Reuse, Recertification, and Recycling.” She was named an American Chemical Society (ACS) “Women Scientist at the Forefront of Energy Research” in 2023 and appointed to the US Technical Advisory Group for the International Electrotechnical Commission (IEC) in 2021. She received her bachelor’s degree in chemical engineering from the University of Minnesota and her PhD in materials science engineering from the University of Pennsylvania, where her research focused on investigating the electronic properties of quantum dot films for emerging photovoltaics. She completed one year as a postdoc at Berkeley National Lab synthesizing and characterizing photonic and plasmonic materials for CO2 reduction before being awarded the Director’s Fellowship at NREL to lead a project on perovskite/quantum dot hybrid materials. While in her current position at NREL, she has co-planned multiple workshops including the PV Reliability Workshop, PV Circularity Workshop, and the workshop: “Confronting Degradation Science to Enable a Long-Lasting Clean Energy Economy.” She has also chaired multiple sessions at various society hosted conferences including the Materials Research Society, IEEE Photovoltaic Specialists Conference, and Gordon Research Conference.

Emily Herndon

Member

EMILY HERNDON is a Senior Consultant in Woolpert's Strategic Consulting Group. Ms. Herndon has spent her career working with clients to develop strategic, long-term asset management programs. She has expertise in goal setting, policy development, strategic planning, capital investment planning, business processes development, change management and communications. She is a member of the Institute of Asset Management (IAM), a co-chair of the National Institute of Building Science (NIBS) Facility Maintenance and Operations Council (FMOC), and a Prosci Certified Change Manager. Ms. Herndon has recently provided a webinar on Total Cost of Ownership for NIBS and presented with the Department of State on data-informed decision making at the 2022 North American Institute of Asset Management Conference.

Greg Hudas

Member

GREGORY HUDAS is currently the DoD Program Manager for Advanced Robotics for Manufacturing Innovation Institute (DoD Manufacturing USA Network). He also serves as a senior Research Scientist for U.S. Army DEVCOM Ground Vehicle Systems Center -Ground Vehicle Robotics Group. He provides technical expertise and strategic support to Army Senior Leadership, and DoD Senior Leadership for Autonomy, AI, and Robotics Technologies in such applications as advanced manufacturing and mobility. Dr. Hudas also serves as a primary technical reviewer for Army Research Office (ARO proposals and MURIs), DARPA technical proposals and efforts, and Small Business Innovative Research (SBIR) proposals concerning robotic and vehicle technologies. He also was a government advisor on the Defense Science Board Summer Study on Autonomy (2015). Dr. Hudas is a member of the Acquisition Corps and Level III certified in multiple areas. He received his B.S. and M.S. in Electrical and Computer Engineering from Wayne State University, and Ph.D. in Electrical and Systems Engineering from Oakland University in 2003. Dr. Hudas has authored/co-authored over 40 technical journal articles and major conference papers.

Wayne E. King

Member

WAYNE KING is an internationally recognized leader in metal additive manufacturing, having worked in the field since 2011. He is a Principal ADDvisor with The Barnes Global Advisors. He has over 30 years of experience ranging from fundamental materials research and applied science to research management. Wayne served as project leader of the Accelerated Certification of Additively Manufactured Metals Project at Lawrence Livermore National Laboratory. Wayne has developed a deep understanding of the additive manufacturing process through this work. Past work includes radiation effects, high-temperature oxidation, atomic structure of interfaces, and grain boundary engineering. He is a 2004, Distinguished Alumnus from Thiel College. Over the past 5 years Wayne published several papers in additive manufacturing and has made several social media posts about additive manufacturing.

Ade Makinde

Member

ADE MAKINDE is currently an independent consultant in additive manufacturing. Previously, he was a Principal Simulation Engineer at VulcanForms, Inc., a manufacturer of a novel additive manufacturing machine and supplier of parts to original equipment manufacturers in the orthopedic and aerospace industries. His experience includes the application of numerical methods to optimize the additive parts build process and subsequent post-processing to meet desired property and performance requirements. He was a principal engineer at the GE Global Research Center from 1997 to 2022. While at GE, he supervised researchers in the use of finite element analysis, computational fluid dynamics, and the development of specialized numerical and microstructural tools to optimize manufacturing processes and part design for manufacturability. He was also part of the management staff responsible for overseeing the development of analytical tools and processes to aid the design of new products and parts for all of GE's businesses. Dr. Makinde worked closely with GE's suppliers using analytical tools to solve time-sensitive technical issues and to ensure that yield and quality targets were met.

Nabil Nasr

Member

NABIL NASR is currently Associate Provost & founding Director, Golisano Institute for Sustainability at Rochester Institute of Technology (25% of effort) and also founding CEO, REMADE institute (75% efforts) which is a public-private partnership (170 members) with support from the US Department of Energy. I also serve as an expert for the United Nations Environment Programme (UNEP) International Resource Panel and a trustee of the Ellen MacArthur Foundation. I previously served on 2 NRC boards (Board on Manufacturing and Engineering Design and National Materials and Manufacturing Board). My expertise is in the areas of sustainable manufacturing, sustainable design, life-cycle engineering and remanufacturing engineering. Dr. Nasr has two Master degrees from Rutgers University and Penn State University in industrial and systems engineering and a Ph.D. in industrial engineering from Rutgers University.

Abdalla Nassar

Member

ABDALLA NASSAR is the Enterprise Additive Manufacturing (AM) Lead for John Deere. In this role, he is charged with developing and implementing long-term strategies and roadmaps for metal and polymer AM throughout the global organization and serves as the AM competency lead, coordinating research and development activities, supplier engagement, training, standards development, and collaboration with dozens of business units worldwide. Prior to this role, he served as a department head within the Materials Science Division of the Applied Research Laboratory and an Associate Research Professor at Penn State, where he managed and mentored a team of faculty, engineers, and support specialists and executed basic science and applied programs (TRL 1 -8) to meet sponsor needs. Dr. Nassar also developed and taught courses on Engineering and Scientific Principles of AM and Laser-Materials Interactions at the graduate level. He has successfully led numerous government and industry-funded programs, obtained over \$10M in external funding, has published over 50 peer-reviewed articles, granted over a dozen patents and invention disclosures, and is a co-author of a 2023 textbook published by Springer—Additive Manufacturing with Metals - Design, Processes, Materials, Quality Assurance, and Applications. Dr. Nassar received his B.S. degree in Engineering Science in 2008 and his Ph.D. in Engineering Science and Mechanics in 2012, both from Penn State. Dr. Nassar has received several professional recognitions, including the 2020 Freeform and AM Excellence (FAME) Jr. Award, 2020 Applied Research Laboratory Research Publication award, and the 2021 BEYA Modern Day Technology Leader and Science Spectrum Trailblazer awards. Additional engagements include serving as a division editor for the 2023 ASM Handbook on Additive Manufacturing, Volume 24A, severing as a co-lead on the 2023 Army Research Laboratory AM Tech Forecasting virtual workshop, and a panelist and speaker at the 2023 NIST workshop on Empowering Small and Medium Size Enterprises Through Effective AM Data Management.

Ralph G. Nuzzo

Member

RALPH NUZZO is the G. L. Clark Professor of Chemistry Emeritus at the University of Illinois at Urbana Champaign. He is the author or coauthor of more than 350 peer-reviewed papers and 48 awarded U.S. Patents. Most recently (until 2022) he was the G. L. Clark Professor of Chemistry at the University of Illinois at Urbana-Champaign, a faculty he joined in 1991 and where he also held an appointment as a Professor of Materials Science and Engineering. In 2014 he was appointed as an affiliated member of the Chemistry Faculty at the KTH Royal Institute of Technology in Stockholm Sweden. He is currently a Faculty Associate in Applied Physics and Materials Science at The California Institute of Technology, where he served as the Director of the Department of Energy Light-Materials Interactions in Energy Conversion Energy Frontier Research Center. He also was appointed as a faculty visitor in Chemistry at Harvard University in 2022. Professor Nuzzo received an AB degree with High Honors and Highest Distinction in Chemistry from Rutgers College in 1976 and earned a Ph.D. in Organic Chemistry from The Massachusetts Institute of Technology in 1980. He accepted the position of Member of Technical Staff in Materials Research at Bell Laboratories in Murray Hill, NJ in 1980, where he was named a Distinguished Member of the Staff in Research in 1987. He joined the Illinois faculty in 1991. He is an elected Member of the National Academy of Sciences, the American Academy of Arts and Sciences, and the Norwegian Academy of Science and Letters. He is a named Fellow of the American Association for the Advancement of Science, the American Chemical Society, the American Vacuum Society, and the Royal Society of Chemistry. He was named the Kavli Laureate in Nanotechnology in 2022. His other awards include the Forschungspreis of the Alexander von Humboldt Foundation, co-recipient of the George E. Smith Award of the IEEE, co-recipient of the Wall Street Journal Innovators Award for Semiconductors, and the Adamson Award of the American Chemical Society.

Zheng D. O'Neill

Member

ZHENG O'NEILL is the J. Mike Walker '66 Associate Professor in J. Mike Walker '66 Department of Mechanical Engineering at Texas A&M University, and a registered Professional Engineer. She was an Assistant Professor/Associate Professor at The University of Alabama, Tuscaloosa from 2013 to 2019. Dr. O'Neill was a principle investigator at United Technologies Research Center (UTRC) where she led a multi-million-dollar industry and university consortium in development and implementation of scalable modeling and control solutions for energy-efficient HVAC systems from 2006 to 2013. She is an ASHRAE Fellow and IBPSA Fellow, current vice chair and incoming chair of ASHRAE TC 7.5 Smart Building Systems, and on the Editorial Board of the Journal of Building Performance Simulation and an Associate Editor of ASHRAE's Science and Technology for the Built Environment. She currently serves as a Member of ASHRAE's Research Administration Committee (RAC), which oversees and coordinates all ASHRAE research activities. O'Neill has 25 years of industry and academic experience in building sciences and has been the PI/co-PI for projects totaling \$30 M since 2014. Her current research portfolio (<https://hvac.engr.tamu.edu/>) emphasizes and exploits intelligent building operations with advanced sensors and controls, smart ventilation, grid-interactive efficient buildings, smart, resilient, and connected community, heat pump technologies, and well-being in the built environment. O'Neill has published more than 195 journal articles and conference papers. She received her Ph.D. in Mechanical Engineering from the Building and Environmental Thermal Systems Research Group at Oklahoma State University in 2004.

Chinedum E. Okwudire

Member

CHINEDUM ("CHI") OKWUDIRE is a Professor of Mechanical Engineering and a Miller Faculty Scholar at the University of Michigan. Prior to joining the University of Michigan in 2011, he was the mechatronic systems optimization team leader at DMG Mori USA. His research is focused on exploiting knowledge at the intersection of machine design, control, and computing to boost the performance of manufacturing automation systems at low cost. Dr. Okwudire has received a number of awards and recognitions including the CAREER Award from the National Science Foundation; the Young Investigator Award from the International Symposium on Flexible Automation; the Outstanding Young Manufacturing Engineer Award from SME; the Ralph Teetor Educational Award from SAE International; the SME Education Award; and the Russell Severance Springer Visiting Professorship from UC Berkeley. Dr. Okwudire received his Ph.D. in Mechanical Engineering from the University of British Columbia in 2009. He previously served on the 2022 National Academies' committee on Options for a National Plan for Smart Manufacturing Study, and on the 2021 National Academies' committee on Strengthening the Talent for National Defense: Infusing Advanced Manufacturing in Engineering Education.

Melissa E. Orme

Member

MELISSA ORME is the Vice President for Additive Manufacturing at the Boeing Company, where she leads Additive Manufacturing activities ranging from engineering and manufacturing of new designs that differentiate Boeing products; to developing new materials and processes; to establishing the digital thread of the end-to-end values stream. Melissa is a renowned pioneer, innovator and leader in Additive Manufacturing, where her seminal work spans three decades and has resulted in 15 US patents and numerous peer-reviewed journal articles. She has a rich and diverse professional background, having begun her career in academia where she rose to the rank of Full Professor of Mechanical and Aerospace Engineering at the University of California Irvine. There, she established globally recognized research laboratories in the field that is now termed 'Additive Manufacturing,' where she developed methods for controlled electrostatically charged and deflected molten metal droplet deposition for precision manufacturing, direct writing of electronic components, and precise powder production. Subsequently, she transitioned from academia to high tech startups where she served as the Chief Technology Officer of Morf3D, a company that is focused on producing and delivering flight qualified additively manufactured hardware to the aerospace industry. From Morf3D she was recruited by Boeing to lead Additive Manufacturing across all business units. Melissa holds a PhD in Aerospace Engineering from the University of Southern California.

Philip Parisi, Jr.

Member

PHILIP PARISI, JR., P.E., is an Associate Principal at MG Engineering DPC a private consulting engineering firm in the building construction industry. He has over 24 years' experience in plumbing and fire protection engineering and responsibilities include office and project management, specification and standards development for plumbing and fire protection systems. His expertise includes the design of healthcare facilities, life science and research laboratories, high-rise commercial and residential buildings, building repositioning and major infrastructure upgrades. Philip is a licensed Professional Mechanical and Fire Protection Engineer in the State of New York and 17 additional states, and a U.S.G.B.C. LEED Accredited Professional passionate about water conservation, rainwater harvesting and reuse. He is an active member and past president of the American Society of Plumbing Engineers NYC Chapter, as well as member of NFPA and SFPE. Philip served as an adjunct professor at NYU School for Continuing & Professional Studies and Guest Professor at Columbia University School for Professional Studies teaching plumbing and fire protection design in the construction industry. He graduated Rutgers, the State University of New Jersey with a bachelor's degree in mechanical engineering in 2000. He is currently the Chair of the NYC Plumbing Code Revision Committee and for ICC Standard 805 Rainwater Harvesting Systems Committee and Vice Chair of the ICC 815 Sizing Water Distribution, Sanitary Drainage and Vent Piping Systems committee.

Michael Pouchak

Member

MICHAEL POUCHAK currently works as an R&D engineer serving as a systems architect and engineering staff for Honeywell International in the Building Automation, Buildings Management Systems group. Before Honeywell, he worked on high-speed ECL logic interfaces, ECL ATE computer design, automated test equipment (ATE) / PC network communications, Unix Host controller server, data storage HW / SW design interface, electrical hardware design engineer and network computer systems for the ATE industry. Michael has contributed significantly to the art and science of HVAC and has been issued over 26 U.S. and International Patents. and products related to air HVAC systems, DDC controls, and hydronic controls for commercial buildings. He has substantial expertise in the development of building automation controls, and high-volume, low-cost embedded software development of commercial unitary HVAC zone controllers including VAV and CVAHU controllers. Mike has received the Dick Fitzgerald Technical Award, the Honeywell Excellence in Innovation award (division level), and the Big "H" award for excellence in high-value product development. Michael is a Senior Member of the Institute of Electronic and Electronic Engineers. He is a fellow of ASHRAE and is currently president of the ASHRAE College of Fellows. He is the recipient of the Exceptional Service Award and the Distinguished Service Award and has had a wide range of society committee leadership roles. He has served as chair of the Technical Committee of TC 1.4 Control Theory and Application and TC 1.5 Emerging Computing Application and serves on the ASHRAE Technical Council and the Residential Buildings Committee as a voting member. Michael has a bachelor of electrical engineering degree from the University of Minnesota in Minneapolis, Minnesota, and a master of science degree in software engineering from the University of St. Thomas, St. Paul, Minnesota.

Curtis Richardson

Member

CURTIS A. RICHARDSON is a Technical Fellow at Spirit AeroSystems in the area of Automation and the enterprise Distinctive Capability Leader for Industry 4.0. In these roles he leads technical oversight of strategy for automation and digital manufacturing capabilities at the corporate level. With over 25 years of experience developing and deploying automation technology for production environments at Boeing and now Spirit, Richardson has worked with a diverse assortment of aircraft manufacturing processes. These span various levels of fabrication, assembly, and repair for both metal and composite material systems. Throughout most of his career, Richardson has actively engaged with a broad array of consortia and similar collaborative organizations linking industry, academia, and government. He served on the Robotic Industries Association (RIA) board of directors for almost 10 years and has been an active member of the Advanced Robotics for Manufacturing (ARM) Innovation Institute's Stakeholder Executive Council for 7 years. In 2022 he was recognized as SAE's Thomas H. Speller award winner for significant career contributions to manufacturing processes and methodologies related to automated fastening and was named a 2023 ARM Institute Champion. Richardson received his B.S. in Aerospace Engineering from Wichita State University in 1998 and his M.S. in Industrial Engineering from Wichita State University in 2003. He was a contributor to the 2013 edition of the Roadmap for US Robotics – From Internet to Robotics and has been a regular presenter at a range of professional and academic conferences including SAE Aerotech, IFR International Symposium on Robotics, Defense Manufacturing Conference, and NATO Science & Technology Research Symposium on Digital Twin Technology Development and Application. Richardson is also the owner of the Industrial Robotics LinkedIn group with over 130,000 members.

Balaji Santhanakrishnan

Member

BALAJI SANTHANAKRISHNAN is an experienced sustainability leader with over 30 years of experience and has developed hundreds of strong customer relationships by understanding their environmental challenges, desired outcomes, and success criteria while developing carbon reduction programs. He is currently a global technical leader with IBM Sustainability Software. Before this role, he was a product manager with Siemens Building Technologies and an Enterprise program Manager with Johnson Controls. He has a Bachelor's degree in Mechanical Engineering and a master's in Energy Management. He is a member of ASHRAE and the Association of Energy Engineers and a Certified Energy Manager from a LEED-accredited professional.

Carolyn Seepersad

Member

CAROLYN SEEPERSAD is the Woodruff Professor of Mechanical Engineering at the Georgia Institute of Technology. Prior to her appointment at Georgia Tech, she served as the J. Mike Walker Professor of Mechanical Engineering at The University of Texas at Austin. Her research interests include design for additive manufacturing, simulation-based design of materials and structures, and process innovation in additive manufacturing. She is the Editor-in-Chief of the ASME Journal of Mechanical Design. She is a member of the organizing committee of the annual Solid Freeform Fabrication Symposium and a member of SME's Additive Manufacturing Technical Leadership Committee. She is the recipient of the ASME Design Automation Award, the University of Texas Regents' Award for Outstanding Teaching, and several best paper awards from ASME and ASEE. She is the author of more than 150 peer-reviewed conference and journal publications. She received her PhD in Mechanical Engineering from the Georgia Institute of Technology, an MA/BA in Philosophy, Politics, and Economics from Oxford University as a Rhodes Scholar, and a BS in Mechanical Engineering from West Virginia University.

Mohsen Seifi

Member

MOHSEN SEIFI is the Vice President of Global Advanced Manufacturing Programs at ASTM, ascending to this pivotal role in May 2022 after initiating his journey with the organization as the Director of Additive Manufacturing Programs in January 2018. With over 13 years of enriched experience in advanced manufacturing and business development, Dr. Seifi has demonstrated exemplary leadership and technical expertise. Prior to his engagement at ASTM, he managed and contributed significantly to various research and business programs, particularly those funded by the government, showcasing his deep technical expertise and adeptness in business development. Currently, Dr. Seifi spearheads several critical programs at ASTM, including Additive Manufacturing, Robotics & Autonomous Systems, and Wohlers Associates. He guides a team of industry and technical experts in advancing ASTM's initiatives in advanced manufacturing. His responsibilities also extend to driving standardization activities across ASTM's technical committees related to advanced manufacturing, fostering new partnerships, and developing AM standards-related programs and services across diverse ASTM portfolios. Besides his professional commitments, Dr. Seifi serves as an Adjunct Faculty at Case Western Reserve University in Ohio, USA, and holds positions on several advisory boards for major advanced manufacturing programs. His scholarly contributions include co-authoring over 50 peer-reviewed publications, amassing more than 4,500 citations. Dr. Seifi's extensive engagement with the scientific and professional community is further highlighted by his delivery of over 150 invited and keynote lectures at various technical meetings, industry events, and government agencies, alongside chairing numerous conferences and symposia. His profound contributions to the field have been recognized with numerous honors and awards from technical societies.

Vishaldeep Sharma

Member

VISHALDEEP SHARMA is an R&D staff member in the Building Equipment Research Group at Oak Ridge National Laboratory (ORNL) for past 13 years. At ORNL, he has been involved in the assessment and evaluation of low global warming potential (GWP) refrigerants and refrigeration systems. He has expertise in system design optimization, refrigerant compatibility and refrigerant fractionation analysis. He has authored and co-authored over 60 peer reviewed journal articles, conference papers and reports. He has served as a reviewer for leading journals including International Journal of Refrigeration, Applied Thermal Engineering, Applied Energy and International Journal of Heat and Mass Transfer. Mr. Sharma is member of American Society of Heating, Refrigerating and Air-Conditioning Engineers. In ASHRAE, Mr. Sharma is chairing Research Subcommittee of ASHRAE 10.7 Commercial Food and Beverage Refrigeration Equipment.

Larry Sweet

Member

LARRY M. SWEET is currently the director of engineering at the Advanced Robotics for Manufacturing (ARM) Institute. He is a widely recognized robotics and automation expert, working in both commercial organizations and academia. He brings experience in bringing emerging technologies into production by increasing their Technology Readiness Level, concurrent with improvements in factory floor processes and workforce skills. At Amazon, he led the technology transition of all internally developed robotics and automation products from lab status into end-to-end systems in Amazon's global network, responsible cumulatively for 70 percent of Amazon's installed robotics. The ROBIN robot was deployed during COVID-19 to meet urgent customer demand requiring field deployment at scale, concurrent with innovations of AI/ML algorithms, advanced manipulation, exception handling, and synchronization with mobile robot traffic flows. As the chief technology officer at Symbotic, he led the development of systems now deployed across Walmart's network, delivering aisle-specific pallets to grocery stores, an NP-hard problem with over 20,000 SKUs of varying dimensions, weights, compliance, and aisle assignment, while delivering cartons to palletizing cells in precise sequence by fleets of high-speed autonomous mobile robots picking orders from a multi-level storage structure. As the Frito-Lay vice president of Engineering and Technology, he transformed, with three industry-first inventions, 1,200 integrated automated seasoning, packaging, and case packing lines from inflexible single-SKU systems to multi-SKU capability, improving 24/7 product flows by two times. Dr. Sweet also held senior manufacturing and technology roles at ABB Industrial & Building Systems, United Technologies, GE Fanuc, and GE Corporate Research. Industry recognition includes 33 patents, the Edison Award, Manufacturing Leadership Council Outstanding Achiever Award for Supply Chain Excellence for the Symbotic system, and the IR-100 Award. For the U.S. National Roadmap for Robotics Research, Service Robotics, where he co-authored the "Real-time planning and control" section. He was a founding Associate Editor for the IEEE Transactions on Robotics and Automation Systems. He received his Ph.D. and M.S. degrees from MIT, and a B.S. from the University of California, Berkeley. He was a tenured faculty member and Guggenheim Foundation Fellow at Princeton University and associate director at the Institute of Robotics and Intelligent Machines at Georgia Tech.

G. Kumar Venayagamoorthy

Member

G. KUMAR VENAYAGAMOORTHY is the Duke Energy Distinguished Professor of Power Engineering and Professor of Electrical and Computer Engineering at Clemson University since January 2012. Prior to that, he was a Professor of Electrical and Computer Engineering at the Missouri University of Science and Technology, Rolla, USA (2002 to 2011), and a Senior Lecturer in Department of Electronic Engineering, Durban University of Technology (DUT), Durban, South Africa (1996 to 2002). Professor Venayagamoorthy is the Founder (2004) and Director of the Real-Time Power and Intelligent Systems Laboratory. Professor Venayagamoorthy received his PhD and MScEng degrees in Electrical Engineering from the University of Natal, Durban, South Africa. He received his BEng degree with a First-Class Honors in Electrical and Electronics Engineering from Abubakar Tafawa Balewa University, Bauchi, Nigeria. He holds an MBA degree in Entrepreneurship and Innovation from Clemson University.

In the last 30 years, Professor Venayagamoorthy's research has primarily emphasized the development and implementation of advanced computational methods and artificial intelligence based algorithms for smart grid applications (e.g. nonlinear modeling and control of power systems, power system optimization, predictions and forecasting of wind and solar energies, energy management systems, wide area monitoring and control systems, dynamic optimal power flow, electric vehicles, micro-grid systems, demand-response management). He has developed situational awareness and intelligence tools based on synchrophasor data for electric power control center operations and management. Professor Venayagamoorthy is the pioneer in the development and implementation of adaptive and optimal neuroidentifiers and neurocontrollers for power systems. Indirect adaptive control and adaptive critics based optimal controllers have been implemented to control synchronous generators under normal operating conditions and disturbances on actual micro-machines. The adaptive critic control framework has been extended to other smart grid applications including FACTS control, wide area control systems, PV energy management systems, wind farm control, and electric vehicle-to-grid (V2G) transactions. Professor Venayagamoorthy has demonstrated that distributed SmartParks (plug-in vehicles/electric vehicles parking lots) can be used as virtual FACTS devices and grid shock absorbers (damp oscillations), and with intelligent control can mitigate power system oscillations caused by dynamic operation of wind farms and system disturbances. Professor Venayagamoorthy is an inventor of technologies for scalable computational intelligence for complex systems, energy management systems, and dynamic stochastic optimal power flow. Professor Venayagamoorthy is a 2004 US NSF CAREER Awardee, a 2007 US Office of the Naval Research (ONR) Young Investigator Program (YIP) Awardee, and a 2008 NSF Emerging Frontiers in Research and Innovation (EFRI) Awardee. He led the brain2grid project funded by the US National Science Foundation (NSF). He has published over 550 refereed technical articles which are cited ~ 24,000 times with a h-index of 70 and i10-index of over 300. Professor Venayagamoorthy has given over 500 invited technical presentations including keynotes and plenaries in over 40 countries to date. He has provided research guidance and/or mentoring to over 150 graduate and undergraduate students and post-doctoral fellows. Dr. Venayagamoorthy is a Fellow of the IEEE, IET (UK), the South African Institute of Electrical Engineers (SAIEE) and Asia-Pacific Artificial Intelligence Association (AAIA), and a Senior Member of the International Neural Network Society (INNS). He is the Editor of the IEEE Press Series on Power and Energy Systems. He is also a Member of the Board of Governors and the Vice-President for Industry Relations of the INNS.

Gary Wayne Walker

Member

GARY WALKER is currently the Vice President, Facilities and Capital Projects at Seattle Childrens Hospital. Previously Mr. Walker was the Executive Director, Facilities Infrastructure & Safety at Stanford Healthcare. Mr. Walker has specialized in the development, and implementation of asset management and digital solutions for Owners. Walker has over 30 years of experience as an asset manager for the built environment; as a Director, Advisor, and Consultant at General Motors Corporation, Jacobs Engineering, Department of Energy at the National Ignition Facility, and Stanford Health Care. Walker is also an active thought leader on the national and international stages being a frequent presenter of content and keynote presentations, serving in the International Organization for Standardization (ISO) Technical Committee (TC) 251 for Asset Management representing the United States internationally through an American National Standards Institute (ANSI) authorized, ASTM sponsored Technical Advisory Group (US TAG). In addition, Walker remains active in the industry as a Member of the Institute of Asset Management (IAM) and the American Society of Healthcare Engineering (ASHE); and as a licensed Professional Engineer. Mr. Walker received his B.S. in Mechanical Engineering from the University of Illinois, Urbana-Champaign in 1985.

Yunsong Xie

Member

YUNSONG XIE is currently a data scientist in ExxonMobil Technology & Engineering Company. Prior to this position, he served as process integration engineering in Samsung Austin Semiconductor, where he supervised the semiconductor manufacturing chips for 45nm, 28nm, and 14nm node technologies. Before working at Samsung, he was a post-doctoral researcher at Argonne National Laboratory, where he conducted research on developing the next generation of wearable electronics and tracing human activity. Yunsong received his B.A. in Electrical Engineering from the University of Electronic Science and Technology of China in 2009 and his Ph.D. in Physics from the University of Delaware.

Katie Bratlie

Staff Officer