

BUILDING A BRIGHTER FUTURE

THE IEEE-USA

2018

ANNUAL REPORT





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LETTER FROM THE PRESIDENT

As IEEE-USA's 2018 President, I took responsibility for implementing IEEE-USA's prioritization plan—developed by the 2017 Board of Directors, under my predecessor, Karen Pedersen. This austerity-driven approach to streamlining IEEE-USA activities for maximum effectiveness included outreach to other IEEE organizational units to transition, or eliminate, lower priority programs—while prioritizing our remaining resources to enhance our collective impact.

My 2018 leadership priorities also included emphasizing membership, and improving the perceived value and awareness of our career and public policy services to IEEE's U.S. members.

We've made noteworthy progress in each of these areas, as reflected in these Annual Report highlights for 2018. We were successful in advocating new laws that will enhance U.S. leadership in artificial intelligence and quantum computing. We developed a host of new and improved products and services, including the IEEE-USA Consultant Finder, the Pan-Engineering Salary Calculator, and audio versions of IEEE-USA E-Books. Through the MOVE program, we helped the Red Cross assist hundreds of thousands of people displaced by Hurricanes Florence and Michael.

We were also financially successful, generating a positive return to IEEE in excess of our budget, despite the continued decline in IEEE's U.S. Higher Grade membership.

It has been my privilege to represent your interests, and to help guide IEEE-USA's career and public policy programs to help better serve you. I hope you find this report enlightening, and you are pleased with what IEEE-USA is doing to advance the careers and represent the public policy interests of IEEE's U.S. members.

Sincerely,



A handwritten signature in black ink that reads "S L Robinson". The signature is written in a cursive, flowing style.

Sandra L. "Candy" Robinson
2018 IEEE-USA President

INTRODUCTION

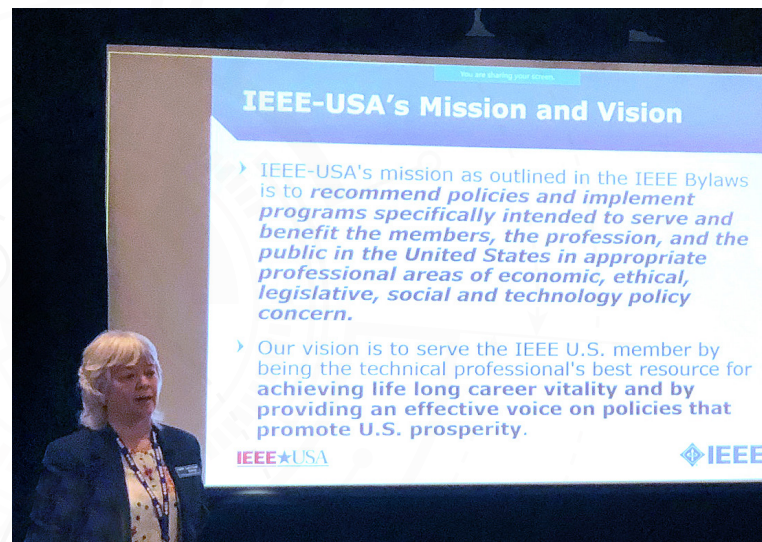
The Institute of Electrical and Electronics Engineers—United States of America (IEEE-USA) is a major organizational unit of the IEEE that traces its origins to the 1973 formation of the IEEE U.S. Activities Committee. IEEE-USA was created to advance the public good and promote the careers and public policy interests of the nearly 160,000 engineers, scientists and allied professionals who are U.S. members of the IEEE. IEEE-USA is led by a volunteer board of directors, chaired by the member-elected IEEE-USA President. IEEE-USA's operations are supported by its professional staff based in Washington, D.C., and by more than 650 IEEE member-volunteers.

MISSION AND PURPOSE

As provided in IEEE's By-Laws, IEEE-USA's mission is to "recommend policies and implement programs specifically intended to serve and benefit the members, engineering professionals, and the general public in the United States. IEEE-USA shall be the organizational unit that represents the professional interests of the IEEE before U.S. governmental bodies. It shall also be responsible for coordinating and reporting, under federal disclosure laws, all official communications with government."

This mission is further described by IEEE-USA Policy 1.2, which outlines IEEE-USA's responsibility to:

- ★ **PROMOTE** the professional, social, economic and ethical status of electrical, electronics, communications and computer engineering, as well as computer science and allied branches of engineering, and the related arts, sciences and technologies, and related technical professionals in the United States, with a special emphasis on U.S. IEEE members
- ★ **PROVIDE** technical advice and policy perspectives to U.S. policymakers at all levels, in the areas of electrotechnology and information technology, to improve the quality of life, and for the benefit of the public
- ★ **WORK** with U.S. policymakers and regulators to enhance the careers and improve the working conditions of U.S. engineers, and other technical professionals
- ★ **DEVELOP** products and services that support the lifelong professional development and career vitality needs of U.S. IEEE members, and other technical professionals
- ★ **SUPPORT** communication with and among U.S. IEEE members, potential members, their employers, and the public about IEEE-USA, and the professional issues that affect its members and their professions
- ★ **ENHANCE** public awareness and understanding of electrical, electronics and computer engineering, and related technical fields



PRESIDENTIAL GOALS

At the start of the year, President Robinson outlined her 2018 priorities to the IEEE-USA Board of Directors as:

- ★ **FOCUSING** on our Strategic Priorities and improving our impact in Public Policy and Career/Member Services
- ★ **WORKING** with IEEE-MGA, and other IEEE OUs, to transition/phase-out lower priority programs
- ★ **ENHANCING** communications with the U.S. members
- ★ **COLLABORATING** across IEEE OUs to eliminate duplication, leverage resources, and enhance impact
- ★ **PROMOTING** U.S. IEEE Membership
- ★ **DEVELOPING** new revenue sources consistent with our mission and purposes



FINANCES

IEEE-USA operates on an annual budget approved by the IEEE Board of Directors.

IEEE-USA's 2018 operations budget was \$5.21 million. This budget supported the programs, volunteer activities and staff highlighted in this annual report.

IEEE-USA's activities are primarily funded through a mandatory assessment of IEEE's U.S. Higher Grade members, indexed to inflation. The 2018 assessment was \$45. This assessment generated approximately 95 percent of IEEE-USA's operating revenues for the year.

Through careful budgeting and efficient management, IEEE-USA ended Fiscal Year 2018 with an \$84.4 thousand operational surplus. Interest and dividends earned on reserves brought the year-end net surplus to \$299.0 thousand, and helped increase IEEE-USA's financial reserves to \$3.55 million.

In addition to IEEE-USA's operating budget, tax-deductible member contributions to the IEEE-USA Fund, the IEEE-USA E-Week Fund, the MOVE Disaster Relief Fund, and/or the IEEE-USA Awards Fund provided seed money for new career and professional programs and services. For information on how you can support IEEE-USA through a voluntary contribution, see: www.ieeeusa.org/about/development.asp.

IEEE-USA's 2018 Treasurer was Scott Tamashiro.

SHAPING PUBLIC POLICY

IEEE-USA's public policy programs and staff serve a three-fold purpose. We proactively advocate for new laws and regulations. We work to educate policymakers about the potential uses, limitations and social implications of technology. We also work to inform and engage our U.S. members on important public policy issues. In each of these areas, we celebrated successes and saw notable progress during 2018.

NOTABLE ADVOCACY OUTCOMES

IEEE-USA's public policy activities include direct advocacy for passage of legislation and adoption of regulations that enhance U.S. science and technology, promote U.S. competitiveness, and enhance the STEM profession. Notable achievements in 2018 included:

★ **QUANTUM RESEARCH:** The IEEE-USA-supported *National Quantum Initiative Act* (H.R. 6227) was signed into law on 21 Dec., directing the establishment of a 10-year plan to accelerate development of quantum information science and technology applications, establish federal quantum coordinating and advisory bodies, and authorizing new quantum programs and responsibilities for NSF, DOE and NIST.

★ **ENERGY RESEARCH AND LABORATORY MODERNIZATION:** The IEEE-USA-supported *DOE Research and Innovation Act* (H.R. 589) was signed into law on 28 Sept., making provisions for upgrading DOE's laboratory modernization, enhancing technology transfer, and updating the research priorities for DOE's Office of Science—for the first time in eight years.

★ **DEFENSE S&T RESEARCH:** The IEEE-USA-supported *Department of Defense and Labor, Health and Human Services, and Education Appropriations Act, 2019* (H.R. 6157) was signed into law on 28 Sept., increasing funding for Defense S&T programs by 7.6 percent, or \$2.3 billion above the White House request.

★ **FEDERAL AI ADVISORY BODY:** The *John S. McCain National Defense Authorization Act for Fiscal Year 2019* (H.R. 5515), was signed into law on 13 August. It authorized establishment of an IEEE-USA supported National Security Commission on Artificial Intelligence—to review and advise the Defense Department on advances in artificial intelligence, related machine learning developments, and associated technologies. This legislative proposal was one of five IEEE-USA legislative proposals supported and considered in the 115th Congress, to establish a national advisory committee on AI.



★ **SUPPORT FOR SMALL TECH BUSINESS:** IEEE-USA advocated for provisions to enhance the Department of Defense's engagement of small tech businesses and start-ups in defense research (i.e., innovators' database and increased SBIR/STTR technical and business assistance, including IP protection). These provisions were included in the *McCain National Defense Act* (H.R. 5515), signed into law on 13 Aug.

★ **PATENT REFORM:** IEEE-USA successfully supported the U.S. Patent and Trademark Office's adoption of a proposed rule harmonizing the standards used for claim interpretation in post-issuance patent reviews, with the claim review standards for patent issuance.

★ **LABORATORY FOR LASER ENERGETICS:** IEEE-USA worked with a coalition of IEEE New York Sections (Buffalo, Rochester, Syracuse, Ithaca, Binghamton, Mohawk Valley and Mid-Hudson) to organize a grassroots response by members concerned with administration proposals to defund the Department of Energy-supported Laboratory for Laser Energetics, at the University of Rochester, home of the OMEGA high-energy laser. Laboratory funding was included in the FY2019 federal budget.

Other Public Policy Highlights: IEEE-USA government relations efforts also saw progress made on a host of other priority issues, including:

★ IEEE-USA partnered with SPIE to lead a coalition to advocate for NIST's Scientific and Technical Research Services program, and for NIST's construction funding. The group drafted a letter requesting a four percent real increase in FY19 funding for the lab programs that make up the Scientific and Technical Research Services (STRS) program, as well as that same increase for NIST infrastructure and construction projects. IEEE-USA representatives met with staffers in various Hill offices, on behalf of the coalition, to plan for future briefings and activities for next year.

★ IEEE-USA also engaged the NIST Federal Advisory Group, about coordinating our respective activities in the next Congress. While the appropriations process is on-going, at the moment NIST is due to receive a FY2019 budget of around \$1 billion. This amount is down from FY2018 (\$1.2 billion), but that budget included a large, one-time increase in funding for infrastructure improvements. NIST's FY19 budget should include a modest operational increase from FY18, ignoring one-time infrastructure spending.

★ IEEE-USA-supported "Dig Once" legislation, i.e., the *Broadband Conduit Deployment Act of 2018* (H.R. 4800), by Reps. Eshoo (Calif.) and McKinley (W.Va.), was incorporated into *The Ray Baum Act* (FCC reauthorization) (H.R. 4986), by voice vote. It passed the U.S. House of Representatives on 6 March.

★ IEEE-USA worked with congressional offices in support of an appropriations amendment that would have provided \$2.5 million to re-institute the Office of Technology Assessment (OTA)—to help Congress understand emerging technologies and their policy implications. Although it failed by a recorded vote, the 195 votes it received were the most ever for restoring OTA. In separate legislation, which IEEE-USA also supported, Congress added funding to the Government Accountability Office (GAO) to enhance its technical assessment program.

★ IEEE-USA provided advice and assistance to the staffs of Reps. Barbara Comstock (Va.) and Dan Lipinski (Ill.), the chair and ranking member of the House Science Subcommittee on Research and Technology, in organizing the subcommittee's 27 Feb. hearing on *Sexual Harassment and Misconduct in Science*.

★ IEEE-USA and the Inventor's Project collaborated on a briefing for members of the Congressional Inventions Caucus on *How to Evaluate Disruptive Inventions*, held on 14 Mar. The briefing focused on ways that capital investors (and government policymakers) can better assess the potential economic value of new and emerging technologies.

- ★ On 6 April, *The Wall Street Journal* highlighted IEEE-USA's position on high-skilled immigration.
- ★ On 18 April, IEEE-USA sponsored a congressional briefing on *Next Generation Robotics and the Future of Work* for the congressional Robotics Caucus. The oversubscribed briefing featured remarks by U.S. Representatives Mark Doyle (Penn.) and Rob Woodall (Ga.); and presentations by Ramayya Krishnan (Carnegie Mellon), Mark Lewandowski (Procter & Gamble), Jim Key (USW Atomic Energy Workers Council), Ritch Ramey (RAMTEC Ohio), and Seth Hutchison (George Tech Institute for Robotics).
- ★ On 20 April, IEEE-USA representatives met with representatives of the House Small Business Committee, the federal Small Business Administration, the Food and Drug Administration, the U.S. Trade Representative, and the International Trade Administration, to raise awareness of small and start-up technology business needs and issues.
- ★ On 24 April, IEEE-USA President Candy Robinson introduced Matthew Hourihan (AAAS R&D Budget and Policy Program) and his talk on the FY19 Federal Research and Development Budget at the 15th Annual Engineering Public Policy Symposium, held in the Rayburn House Congressional Office Building. The Symposium is a joint activity convened by ASME, with support by IEEE-USA and the other engineering "Founder Societies."
- ★ On 25 April, the U.S. House of Representative approved the *Innovators to Entrepreneurs Act* (H.R.5086), an IEEE-USA supported bill by Rep. Dan Lipinski (Ill.) that would expand participation in the National Science Foundation's

Innovation Corps ("I-Corps") program, to include Small Business Innovation Research Program grantees, and other entities, to make the program more relevant for small businesses. The bill was referred to the Senate Committee on Health, Education, Labor and Pensions for consideration, where it still sits.

- ★ On 26 April, the annual Convocation of Engineering Societies was live-streamed on the Internet. Co-sponsored by the National Academy of Engineering and the American Association of Engineering Societies, the Convocation featured half-day sessions on cybersecurity and the resilience of the national electric grid. IEEE-USA arranged for a number of IEEE members as expert panelists—including Greg Shannon, M. Granger Morgan and Jay Apt (Carnegie Mellon); Susan Landau (Fletcher School of Law & Diplomacy); William Sanders (Univ. of Illinois at Urbana-Champaign); and Terry Boston.



2018 IEEE-USA President Candy Robinson (r) introduces Matthew Hourihan (AAAS R&D Budget and Policy Program). Hourihan spoke on the FY19 Federal Research and Development Budget at the 15th Annual Engineering Public Policy Symposium, held in the Rayburn House Congressional Office Building.

- ★ On 8 May, IEEE-USA hosted a briefing on Wearable Computing for the congressional R&D Caucus, highlighting current and future applications of wearable computing, with a focus on how federal R&D funding has helped advance the technology. Dr. Tom Martin, of Virginia Tech, delivered the briefing.
- ★ 45 IEEE members from 19 states participated in a total of 71 meetings with Members of Congress and/or their staff, as part of the 2018 SET Congressional Visits Day (CVD) (8-9 May). IEEE-USA coordinates CVD, an annual, two-day, multi-society event that brings scientists, engineers, mathematicians, researchers, educators and technology executives to Washington, D.C., to raise visibility and support for science, engineering and technology.



Above: IEEE members Jim Isaak (r) and Robert Zakon (l) from New Hampshire, met with N.H. Senator Jeanne Shaheen at 2018 SET CVD.



Above: 2018 IEEE-USA CVD participants, with one of two, George E. Brown award winners, Rep. Jim Langevin (Rhode Island).



(L-R): Pam Jones, Steve Bonk and Denis King, representing the IEEE delegation from Maryland; met with Maryland Senator Ben Cardin during SET CVD.



Right: IEEE Member Julie Clark met with Rep. Mike Kelly, from Pennsylvania.



2018 IEEE-USA President Candy Robinson (l), joined IEEE-USA President-Elect Tom Coughlin in presenting the George E. Brown Leadership Award to Sen. Lisa Murkowski (Alaska), on Capitol Hill, in conjunction with CVD, 8 May.

- ★ In conjunction with Congressional Visits Day, IEEE-USA President Candy Robinson, joined by IEEE-USA President-Elect Tom Coughlin, presented the STEM communities' George E. Brown Leadership Award to Senator Lisa Murkowski (Alaska) to recognize her support as Chair of the Senate Energy and Natural Resources Committee for federal energy-related R&D. The award was presented at the CVD's Capitol Hill reception on 8 May.
- ★ On 23 May, IEEE-USA co-sponsored the STEM Education Coalition congressional briefing on *Preparing for Next-Generational STEM Jobs: Partnerships between Higher Education and Industry* for members of the congressional STEM Education Caucus.
- ★ On 1 June, IEEE-USA joined with the Wilson Center in co-sponsoring a joint briefing for the congressional AI and Cybersecurity Caucuses, on *AI & the Future of Cybersecurity: What Cybersecurity Professionals Think about AI-Based Cybersecurity Technology*. The briefing featured expert panelists from Webroot, Inc., Core Security, Cisco Systems, Carnegie Mellon University and Intel Corporation.
- ★ In early July, congressional offices' staff approached IEEE-USA to organize a caucus briefing on quantum computing technology. They also asked IEEE-USA to provide information and expert contacts, who could assist in drafting a legislative proposal, authorizing the U.S. Veterans Administration to explore possible uses of artificial intelligence to enhance health care for veterans. IEEE-USA input from those engagements was subsequently incorporated into the *National Quantum Initiative Act*, which was signed into law in December.
- ★ In July, IEEE-USA communicated with Congress—endorsing inclusion of selected small business provisions in the *National Defense Authorization Act of 2019*—and petitioned the White House Office of Science and Technology Policy to solicit public input, as OSTP works to develop a proposed national artificial intelligence strategy for the United States.
- ★ IEEE-USA coordinated a series of meetings on 16-17 August with IEEE quantum experts, and the staff of Rep. Will Hurd; and representatives of the White House Office of Technology Policy, and the National Institute of Standards and Technology, to discuss the outlook for quantum technology and related standards development activity. Rep. Hurd is co-sponsor of the *National Quantum Initiative Act*, which would authorize quantum-related federal research programs at NIST, the National Science Foundation and the Department of Energy, and establish a National Quantum Initiative Advisory Committee in the White House.
- ★ Senator John Thune, Chair of the Senate Commerce, Science and Transportation Committee, publicly thanked IEEE-USA for its support of Dr. Kelvin Droegemeier for appointment as Director of the White House Office of Science and Technology Policy, during remarks at Droegemeier's confirmation hearing on 5 Sept. The Senate Committee unanimously approved Dr. Droegemeier during the hearing.

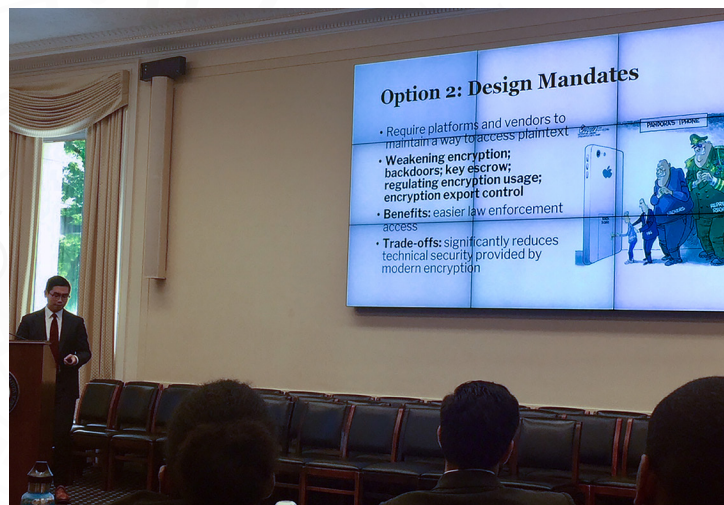
- ★ On 25 Sept., U.S. Representatives Will Hurd (Texas) and Robin Kelly (Ill.), the chair and ranking member of the House Oversight and Government Reform Subcommittee on Information Technology, released a whitepaper on artificial intelligence and its growing impact on U.S. policy. IEEE-USA worked extensively over the previous months with Rep. Hurd and his staff in support of a series of committee hearings. In addition, IEEE-USA provided input to the whitepaper, which looks at the prospective impact of AI on jobs and privacy, as well as the malicious uses of AI. Both hearings and whitepaper were designed to set the stage for future legislation. The whitepaper references the work of the IEEE-SA and its Global Initiative on Ethics and Autonomous and Intelligent Systems.
- ★ In Sept., the U.S. Congress passed FY2019 appropriations for the Department of Energy, including funding for programs IEEE-USA proactively supported. The bill includes significant increases for advanced computing and nuclear engineering; as well as the Office of Energy Efficiency and Renewable Energy, and ARPA-E, which the White House had targeted for elimination.
- ★ On 4 Oct., Rep. Ro Khanna (Calif.) released a set of principles for inclusion in an *Internet Bill of Rights* planned for introduction in the 116th Congress (2019). In his public announcement, Khanna acknowledged input IEEE-USA and other sources provided.
- ★ In response to public comments and IEEE-USA's recommendations, the U.S. Patent Office issued a final rule on 11 Oct. abandoning the *Broadest Reasonable Interpretation* (BRI) Rule for patent claim construction during inter partes review (IPR) proceedings, and adopting the Phillips Rule—the same standard used to construe patent claims in patent infringement litigation in federal district courts.
- ★ IEEE-USA Past President Karen Pedersen participated in a Roundtable Breakfast Discussion on Technology and 5G, organized by Atlantic magazine on 4 Oct., in Washington, DC. The Atlantic roundtables convene intimate groups of leaders across sectors, to discuss emerging technology issues.
- ★ IEEE-USA submitted an Amicus Brief on 16 Oct., responding to the *Helsinn Healthcare v. Teva Pharmaceuticals USA* Supreme Court Case, in accordance with IEEE-USA's longstanding position statement on *Patent Prior Art*. After hearing oral arguments, the Supreme Court issued a final ruling on 22 January 2019, by a 9-0 vote, that sustained the position IEEE-USA advocated.
- ★ With assistance from IEEE-SA's Ethically Aligned Design Committee, IEEE-USA provided input on 26 Oct., to a proposed update of the United States National Artificial Intelligence Research and Development Strategic Plan, in response to the National Science Foundation's request for public comments.
- ★ On 30 Oct., IEEE-USA and IEEE Standards staff briefed representatives of the British Embassy's Science and Innovation Network, and the UK Center for AI Ethics, on IEEE's Global Initiative on Ethics of AI, and related IEEE-USA AI advocacy efforts.
- ★ IEEE-USA co-sponsored a 28 Nov. briefing on *New Approaches to Engaging Middle and High School Students in Science and Engineering*, organized by the STEM Education Coalition and the National Science Teachers Association, for interested Senators and their staff. The briefing featured a panel of education experts discussing evidence-based ways to improve middle and high school science and engineering education; and highlighted a recent National Academies report on *Science and Engineering for Grades 6-12*.
- ★ During December, IEEE-USA worked with the staff of Rep. Brenda Lawrence (Mich.) on legislative language to promote the ethical development of artificial intelligence (AI). Rep. Lawrence introduced House Resolution 153—supporting the development of guidelines for ethical

employment of artificial intelligence—in the U.S. House of Representatives on 27 Feb.; and the House referred the resolution to the House Committee on Science, Space and Technology for consideration.

- ★ IEEE-USA and the IEEE Standards Association provided expert panelists for a workshop on *AI, Ethics, and Policy: UK & U.S. Approaches*, hosted by the British Embassy in Washington, D.C., on 2 December. Mina Hanna, chair of the IEEE-USA Artificial Intelligence and Autonomous Systems Policy Committee represented IEEE-USA.
- ★ IEEE-USA joined the Federal Energy Regulatory Commission, and other federal agencies, as supporting organizations of the Federal Energy Policy Summit, held on 4-6 December, in Washington, D.C.
- ★ IEEE-USA co-sponsored an ASME-organized briefing on *Robots in the Manufacturing Environment: An Insider's Look at Advanced Technologies in the United States* on 12 Dec. The Congressional Robotics Caucus and the House Manufacturing Caucus co-hosted the event.
- ★ IEEE-USA staff met with representatives of the U.S. Government Accountability Office, at their

request, on 14 Dec.—to provide input on GAO's reorganization plans for assisting Congress on science-and technology-related issues.

- ★ Through the year, IEEE-USA closely followed behind the scenes discussions in Congress and the White House—concerning proposed changes to U.S. export controls and visas used by foreign researchers and students—driven by changes in U.S. policy toward China. In addition to tracking developments, IEEE-USA also coordinated with other scientific and technical organizations,



WISE Interns Present on the Hill: (Top) Alexander Meier, University of Nebraska, presents on *Power from the People: The Role of Utilities with Distributed Generation*. (Bottom Left) Raine Sagrainsingh, Florida State University, speaks on *Lethal Autonomous Weapon Systems: Artificial Intelligence vs. Autonomy*. (Bottom Right) Zeyi Lin, University of Texas, Austin, presents: *Decoding Encryption Policy: Balancing Privacy, Security and Law Enforcement Concerns*.

industry and university groups to ensure a strong response—if and when troubling proposals emerged. Congress eventually agreed to include a new process for considering export controls on “emerging and foundational technologies” deemed essential to the national security of the United States. The new process is outlined in the *McCain National Defense Authorization Act* (NDAA) for FY2019, signed into law on 13 August.

- ★ IEEE-USA continued to advocate to Congress for improved access to green cards for skilled immigrants and reforms to the H-1b temporary visa program. Despite continued legislative interest and circulation of numerous proposals, Congress did not act on any immigration or H-1B reform measures by year-end. However, the administration instituted a number of measures, under executive authority—designed to limit H-1B eligibility and police abuse.
- ★ IEEE-USA sponsored three 2017-2018 Congressional Fellows. Dr. Marc Canellas (Georgia Tech) advised Rep. Derek Kilmer (Wash.) on artificial intelligence, cybersecurity, space and aviation, and general science issues. Dr. Ron Hira (Howard Univ.) helped staff the

House Education and Workforce Committee, where he organized hearings, helped draft legislation, and advised on labor policy, diversity issues and technology workforce development. Long Lam (Carnegie Mellon Univ.) advised Senator Jeff Merkley (Ore.) on issues related to electric vehicles and international cooperation to promote clean energy.

- ★ IEEE-USA also selected three Congressional Fellows for the 2018-2019 Fellowship year: Dr. Elliot Eichen (SUNY Stony Brook) accepted a Fellowship assignment as science advisor to Senator Ron Wyden (Ore.); Ethan Keeler (Univ. of Washington) took a position in the office of Sen. Maria Cantwell (Wash.); and Dr. Daniel Becerra (UC-Santa Barbara) accepted a placement on the staff of Senator Jeff Merkley (Ore.). Dr. Daniel J. Moore (Rose-Hulman Institute of Technology) was selected as IEEE-USA’s 2018-2019 Engineering and Diplomacy Fellow at the U.S. State Department, serving in the Office of the Science and Technology Advisor (STAS).
- ★ IEEE-USA supervised three IEEE interns in the multi-society Washington Internships for



(Right) Dr. Ron Hira, Long Lam, Dr. Marc Canellas

(Left) The Fellows Committee and 2018-2019 IEEE-USA Government Fellows enjoy a celebratory dinner in February, 2019 in Washington, D.C.. From left to right: Merin Rajadurai, State Department Representative; Peter Winokur, Fellows Committee; Rebecca Taylor, Fellows Committee; Yan Zheng, Fellows Committee; Kyle Bunch, Fellows Committee; Daniel J. Moore, 2018-2019 State Department Fellow; Russell Harrison, IEEE-USA Director of Government Relations; Ethan Keeler, 2019-2019 Congressional Fellow; Daniel Becerra, 2018-2019 Congressional Fellow; Tom Tierney, Fellows Committee



Students of Engineering (WISE) program, during Summer 2018. Zeyi Lin (University of Texas, Austin) explored ways to balance privacy, security and law enforcement concerns with respect to strong commercial encryption. Alex Meier (University of Nebraska-Lincoln) looked at utility and related regulatory issues arising from the growth of distributed generation and the deployment of localized micro-grids. Raine Sagramsingh (Florida State University) explored issues related to artificial intelligence and lethal autonomous weapons. Their research appears in the open access WISE Journal of Engineering and Public Policy at: <http://wise-intern.org/journal/2018/WISE2018.html>.

The Washington Internships for Students of Engineering (WISE) is a nine-week summer program, held in Washington, D.C., that introduces participants to technology policy. In addition, the students explore how engineers and scientists can contribute to legislative process and regulatory decisionmaking. IEEE-USA, IEEE Technical Activities and the IEEE Life Members Committee jointly fund IEEE's participation in the WISE program.

- ★ IEEE-USA issued a total of 31 policy communications to Congress or the executive branch, either directly or through issue coalitions, in 2018. The IEEE-USA Board of Directors has approved the release of 13 new or updated IEEE-USA position statements, on such topics as spectrum policy deliberations, greening of the electric power supply, and digital personal privacy.
- ★ During 2018, IEEE-USA also directly supported congressional caucuses on Artificial Intelligence, Research, Robotics and Inventions. Caucuses are groups of members of the U.S. Congress that meet to pursue common legislative objectives.

- ★ IEEE-USA organized or co-sponsored nine congressional briefings or events designed to help inform and educate Members of Congress and their staffs on the policy implications of targeted emerging and disruptive technologies. Briefing topics included:

2018 Congressional Briefings	
27 February	Sexual Harassment and Misconduct in Science (Research and Technology Committee)
14 March	How to Evaluate Disruptive Technologies (Inventions Caucus)
18 April	Next Generation Robotics and the Future of Work (Robotics Caucus)
8 May	Wearable Computing (Research Caucus)
23 May	Preparing for Next-Generational STEM Jobs: Partnerships between Higher Education and Industry (STEM Education Caucus)
1 June	AI and the Future of Cybersecurity (AI Caucus)
26 July	Advancing Healthcare using Artificial Intelligence (AI Caucus)
28 November	New Approaches to Engaging Middle and High School Students in Science and Engineering
12 December	Robotics in the Manufacturing Environment (Robotics and Manufacturing Caucuses)

U.S. Advisory Committee to UNESCO: During 2018, former IEEE-USA and IEEE President Gordon Day served as IEEE-USA's 2018 representative to the U.S. Advisory Committee to UNESCO. This Committee advises the State Department on U.S. participation in UNESCO and its development programs. The Advisory Committee met once in 2018, for advice on its on-going status, in light of the U.S. decision to withdraw from UNESCO.

SUPPORTING MEMBERS CAREERS

IEEE-USA strives to provide high quality products and services designed to enhance the careers and support the professional development of IEEE's U.S. members at all stages of the career life-cycle. This chapter highlights our efforts to support members' careers in 2018:

Future Leaders Forum: IEEE-USA held a successful 2018 Future Leaders Forum for nearly 250 participants, on 26-28 July, in Austin, Texas.

- ★ Featured speakers included Steven Sasson, inventor of the digital camera; Larry Hornbeck, digital light projection innovator; Nagesh Rao, CTO for the federal Small Business Administration; and celebrity chef Patrick Stark from Food Network's Chopped and Cut Throat Kitchen.
- ★ Selected speakers and panels were broadcast live on the Internet, or made available for post-conference viewing on YouTube, and other platforms.
- ★ Samsung, Raytheon, IBM, TECO Westinghouse, Arm, Atec, Capital One, Schlumberger, Cirrus Logic, and Mercer provided corporate support.
- ★ TechRadar named the event to its list of Top Tech Conferences for 2018, alongside such heavyweight events as CES, Mobile World Congress, Future-Tech Expo and Google Cloud Next. TechRadar is one of the top 10 tech news sites in the world.
- ★ Based on feedback from Future Leaders Forum attendees, IEEE-USA decided to rebrand its leadership conference and laid plans for EVO19—The Evolution of You—to be held in Pittsburgh, Pa., on 2-3 August 2019.

Career & Professional E-books and Audiobooks:

In 2018, IEEE-USA provided members with complimentary access each month to a different career-related title drawn from our catalog of 256 e-books. Members downloaded a total of 10,747 e-books in 2018.

Career and Professional Webinars: IEEE-USA delivered 17 career & professional webinars in 2018, in addition to 14 government affairs updates. We also provided members with access to more than 200 archived webinars, with supporting slides and documents, as a no-cost member benefit.



(L-R): Future Leaders Forum attendee Maryfaith Rodgers, along with FLF committee members Denise Griffin and Charles Rubenstein, enjoy dinner at Scholz Garten



Left: IEEE-USA Presidents Candy Robinson (2018) and Tom Coughlin (2019) attend the 2018 Future Leaders Forum.



Virginia Tech student Jahin Habib attends a Future Leaders Forum workshop. Habib was a student attendee, sponsored by the IEEE University Partnership Program.

Right: Future Leaders Forum attendee Elizabeth Farkas enjoys a keynote speaker. Farkas was a student attendee from University of California, San Diego, sponsored by the IEEE University Partnership Program.



The 2018 schedule of career and professional development webinars included:

- ★ 11 Ways Consultants “Overpay” on their Taxes—and How to Stop It Now! (18 January)
- ★ So You Want To Be A Consultant? (8 February)
- ★ Don’t Speak Like An Engineer—Think Like One! (22 February)
- ★ Managing Risk for the Engineering Consultant (7 March)
- ★ The Art and Pleasure of Home Brewing (16 March)
- ★ Communicating 300% Better (29 March)
- ★ Building the Consultant Practice of Tomorrow Using Today’s Online Tools (5 April)
- ★ IEEE Collabratec—Why You Should Join an Online Community (27 April)

- ★ Tips for a More Fulfilling Career—Without Starting Over (14 June)
- ★ What Hiring Managers Want to Hear from Candidates in a Phone Interview (21 June)
- ★ Engineering Careers in Social Innovation and Global Sustainable Development (19 July)
- ★ Helping You—and the Children in Your Life—Learn STEM Subjects More Effectively (7 August)
- ★ Damaging Phrases Women Use In The Office (9 August)
- ★ Good Girls Ask—Negotiations for Women (16 August)
- ★ How to Get Invited into The Boys Club—and Why It’s Important (13 Sept.)
- ★ Dissatisfied With Your Job? (27 Sept.)
- ★ All You Ever Wanted to Know about the New IEEE-USA Consultant Finder (14 Nov.)

IEEE-Salary Service: IEEE-USA’s 2018 Salary Survey closed on 11 May with nearly 4,700 respondents. In September, IEEE-USA released the *2018 Salary & Benefits Report*, and updated the IEEE-USA Salary Calculator, to reflect the new survey data. As a special membership incentive, IEEE-USA provided newly elevated U.S. student members with free usage of the Salary Calculator—as a tool to help benchmark salary offers, as they enter the job market. Special salary reports on Power and Energy, Computing, and Young Professionals were also released, in December.

IEEE-USA completed the 2018 Employment Survey in October, and published the Survey Report in November 2018. This survey assesses challenges facing unemployed U.S. IEEE members.

Consulting Services: IEEE-USA supported U.S. IEEE members engaged in consulting, with a variety of products and services during 2018, including:

- ★ In mid-Sept., IEEE-USA unveiled the reengineered Consultants Finder tool, powered by IEEE Collabratec. The new tool makes it easier for IEEE members to advertise their consulting services, and for companies to find consultants and post consulting assignments. Marketing and promotional efforts included a Google AdWords campaign; while a 14 Nov. introductory webinar helped draw 28,154 visitors to the Consultants Finder tool between launch (22 September) and 31 December 2018. By year-end, well over 300 IEEE member consultants had subscribed to use the new tool.
- ★ IEEE-USA supports the IEEE Consultants Network, a membership interest group that has grown to more than 5,000 member/subscribers by year-end 2018. Network members receive a free IEEE-USA newsletter, with tips from practitioners, and information on upcoming consultant workshops and webinars.
- ★ IEEE-USA also helped support the IEEE Consultants Exchange, an IEEE Collabratec Community with more than 800 registered participants in 2018.
- ★ As a service to IEEE member consultants, IEEE-USA published its *2018 Consultants Fee Survey* in August. The 2018 survey collected data from 457 participants on consulting fees, and other consulting practices.
- ★ IEEE-USA's Alliance of Independent Consultants Networks Coordinating Committee (AICNCC), held a full-day Consultants' Workshop in

Pittsburgh, Pa., on 21 April. In addition, the AICNCC partnered with the IEEE Melbourne Florida Consultants Network to organize a full-day Consultants' Workshop in Melbourne on 27 Oct. Topics included networking, how to become a consultant, how to find clients, retirement planning and entrepreneurship. Workshop proceeds benefited operations of the newly formed Consultants Network.



Above: Future Leaders Forum presenters Natalia Baklitskaya and Bryan Cover, FLF committee member Chan Wong and FLF Chair Nicole Skarke enjoy dinner at Scholz Garten.



Future Leaders Forum committee member Chan Wong and FLF presenter Hannah Donahue prepare on stage before Ms. Donahue's presentation "What Do I Wear and Why Should I Care?" on workplace fashion and branding.

Licensure and Registration: In the area of licensure and registration, IEEE-USA's expert volunteers assisted the National Council of Examiners for Engineering and Surveying (NCEES) in developing the annual Professional Engineering (P.E.) examinations for electrical and computer engineering, the fundamentals of engineering and software engineering. IEEE-USA's Licensure and Registration Committee also tracked state-level developments and policy issues related to the practice of engineering.

In March 2018, NCEES announced discontinuation of the Principles and Practice of Engineering (P.E.) Software Engineering exam, after the April 2019 exam administration. IEEE-USA and the IEEE Computer Society had jointly supported development of the software engineering model examination for NCEES. However, the failure of interested states to adopt licensing requirements; and the requirement that SE exam-takers first pass the NCEES Fundamentals of Engineering exam, limited interest in the credential, with only 81 candidates participating nationwide in the first five exam administrations.

Local Professional Activities (PACE): IEEE-USA allocated \$91,000 in professional activities funds to support 124 projects or events conducted across all six U.S. regions. That includes eleven direct PACE project and chapter grants, in addition to formula-driven regional allocations. 2018 highlights included PACE support for:

- ★ Berkshire Section High School STEM Paper Contest (Region 1)
- ★ Providence Section Soft Skills and Mentoring Series (Region 1)
- ★ Spring Tech Symposium for IEEE Student Chapters (Region 2)
- ★ Curious Kids Zone at the Atlanta Science Festival's Exploration Expo (Region 3)
- ★ Missouri S&T IEEE Community Outreach (Region 4)
- ★ IEEE Presidents Forum (Region 5)
- ★ 2018 Women in Engineering Int'l Leadership Conference (Region 6)
- ★ 2018 Rising Stars Conference (Region 6)
- ★ Santa Clara Valley (SCV) Section YP Chapter Grants (Region 6)



Student Professional Activities: During 2018, IEEE-USA sponsored a total of 46 Student Professional Activities (SPAx), and related events. U.S. IEEE student branches at 21 different institutions organized these events, engaging an estimated 2,600 students with career and professional content.

Date of SPAx	Name of Your School
1/24	Cleveland State University
1/26	Cleveland State University
2/5	Cleveland State University
2/12	Cleveland State University
2/17	Cleveland State University
2/23	Cleveland State University
2/23	University of Texas at Arlington
3/9	University of Dayton
3/26	Ohio University
3/28	Cleveland State University
4/6	Cleveland State University
4/6	University of Pittsburgh
4/7	Texas State University
4/12	Cleveland State University
4/13	The University of Texas at Austin
4/13	Cleveland State University
4/14	University of Houston
4/19	Texas Tech University
4/23	Cleveland State University
4/28	Cleveland State University
9/4	Ohio Northern University
9/11	DeVry University Columbus
9/12	Ohio University

Date of SPAx	Name of Your School
9/13	Ohio State University
9/14	Cleveland State University
9/18	University of Dayton
9/24	Zane State College
9/26	Cleveland State University
10/1	Cleveland State University
10/5	Columbus State Community College
10/8	Cleveland State University
10/11	Ohio University
10/16	Cleveland State University
10/17	Cleveland State University
10/24	Cleveland State University
10/26	University of California, Los Angeles
10/26	Cleveland State University
11/2	Cleveland State University
11/5	Cleveland State University
11/6	Marshall University
11/7	Cleveland State University
11/7	The Catholic University of America
11/13	Cleveland State University
11/15	University of Houston - Clear Lake
11/20	Cleveland State University
11/26	Grove City College

Cleveland State University experimented with a “Progressive” implementation of the SPAx program, by hosting a weekly series of student-organized events on professional topics—ranging from leadership training, to hackathons and robotics competitions.

SPAx also sponsored networking activities at the 2018 IEEE-USA Future Leaders Forum, and at the 2018 IEEE MIT Undergraduate Research Technology Conference.

On 10 Oct. 2018, SPAC Chair Robert Vice and Technology Coordinator Taylor Barto presented the program's first live Town Hall event. The 45-minute on-line event provided a brief overview of SPAX event-planning and execution, followed by a talk by program founder Jim Watson, on why SPAX is so impactful to student branches and young members' futures. The presentation concluded with a Q&A, featuring questions submitted by students. The event was recorded and is being used as an orientation tool.

During 2018, IEEE-USA also took note of the growing number of student professional activities being organized outside the SPAX program by U.S. student branches, on their own, or by using PACE funding support from the local IEEE Sections. This trend can be attributed in part to increased section engagement with student branches; and also to the higher funding levels available through PACE grants.

Rooftop Social Launch: IEEE-USA held its inaugural "Rooftop Social" at the Colada Shop in Washington, D.C., on 25 October 2018. Envisioned as a new approach to engaging members that could be emulated locally by IEEE sections, the social also provides a useful venue to market selected IEEE-USA programs and activities. The sold-out event was an overwhelming success, drawing a diverse cross-section of IEEE members, and allowing those attending to network, enjoy great food/ beverages, and find out more about IEEE and IEEE-USA. Based on this success, IEEE-USA is planning to host four Rooftop Socials in 2019.



K-12 STEM Education: IEEE-USA and IEEE Educational Activities jointly promoted the TryEngineering Together mentorship program and IEEE-sponsored STEM summer camps during Discover Engineering Family Day at the National Building Museum (17 Feb. 2018) in Washington, D.C., during National Engineers Week.

IEEE-USA also co-sponsored, provided judges and presented a special Smart Grid Award at the Future City Competition finals, on 20 Feb. in Washington, D.C. during National Engineers Week. Approximately forty teams of 6-8th graders faced off to present their designs for Age-Friendly Smart Cities of the future. The Smart Grid award went to Team Mid-Atlantic, from Edlin School in Reston, Va. Edlin School was also the overall winner of the 2018 Future City Competition.

In addition, IEEE-USA and IEEE Educational Activities co-sponsored an IEEE booth, in support of the TryEngineering Together mentorship program, at the U.S. Science and Engineering Festival, held 2-3 April in Washington, D.C. Seventeen local area volunteers joined IEEE staff in supporting a host of activities, interacting with thousands of teens, children and families during the event, which drew an estimated 365,000 visitors.

On 22-23 Sept., IEEE-USA was an exhibitor at World Maker Faire—New York, at the New York City Hall of Science. Staff and volunteers collaborated to showcase IEEE as part of the East Coast's largest celebration of invention, creativity and curiosity. World Maker Faire New York draws approximately 100,000 participants annually.

Also in 2018, IEEE-USA worked with IEEE Research to conduct a survey of IEEE Young Professionals—exploring their user experiences and preferences, with respect to various on-line job search tools and employment assistance services. Approximately two-thirds of respondents were actively searching for employment opportunities. LinkedIn was the preferred job search tool for the majority of respondents, with nearly 80 percent indicating they relied on personal networking sites such as LinkedIn to search for job opportunities. IEEE-USA has 6,095 in its LinkedIn group, and 229 followers of the LinkedIn company page. Among comprehensive job listing sites, a significant margin preferred Glassdoor and Indeed over more general job sites, such as Monster.



SERVING THE PUBLIC IN NEED

IEEE-USA is partnered with IEEE Regions 3 and 5, and the American Red Cross in the MOVE Community Outreach Initiative, an emergency relief program committed to supporting the Red Cross in its efforts to assist victims of natural disasters, by providing short-term communications, computer and power solutions that support Red Cross field operations, and assist affected residents in disaster areas.

On 19 April, IEEE-USA executed a letter of cooperation with the American Red Cross to facilitate the deployment of IEEE members as Red Cross volunteers around the country to “help their communities prepare for, respond to, and recover from emergencies.” The agreement nationalizes the IEEE-USA MOVE Initiative’s current engagement, which was coordinated through the Central North Carolina Chapter of the Red Cross. The IEEE-USA MOVE vehicle’s area of operations focuses primarily on the South and Southeast United States. Now all six U.S. Regions have a framework, under which they can recruit and train volunteers for participation in Red Cross activities.

On 7 Feb., IEEE-USA MOVE volunteers John Balsam and Tim Forrest completed extended field deployments helping the Red Cross deliver communications equipment to shelters and disaster relief operations centers in Puerto Rico, in the aftermath of Hurricane Maria.

The devastation caused by the back-to-back Hurricanes Florence and Michael prompted an extraordinary, 40-day MOVE vehicle and volunteer teams deployment to North Carolina and Florida—from 12 September through 20 October.

★ IEEE-USA MOVE truck and volunteers were initially deployed to the Red Cross’ forward operations headquarters in Fayetteville, N.C., on 12 September, to support relief and recovery operations in the wake of Hurricane Florence. MOVE volunteers subsequently provided communications, Internet connectivity, and computer support for over 100 relief workers. The hurricane knocked out power to more than 500,000 homes and businesses statewide.



- ★ On 20 Sept., the IEEE-USA MOVE team relocated to a Red Cross shelter in Lumberton, N.C. The shelter housed more than 250 people displaced by Hurricane Florence-related flooding. MOVE provided Red Cross volunteers and shelter occupants there with an Internet connection and WiFi service, including displaced students who used the Internet connection to keep up with their classwork.
- ★ The MOVE truck continued its Hurricane Florence deployment through 8 October, with volunteers subsequently providing assistance with communications and technical support to the Red Cross District 2 Headquarters in Greenville, N.C., the District 6 Headquarters in Wilmington, N.C. and to shelters in Newport, Wilmington and Leland, N.C.
- ★ On 9-11 October, the MOVE truck was repositioned to Anderson, South Carolina; and then to Mobile, Alabama, as the Red Cross began mobilizing assets in response to Hurricane Michael. From Mobile, they moved eastward along the coast to support the federal government's multi-agency Emergency Operations Center in Panama City, Florida. They arrived to a scene of vast devastation, with almost all buildings damaged, fallen trees blocking streets, no electricity, and no cellular or other communications.
- ★ On 12 October, MOVE redeployed to support operations at an emergency shelter, providing Internet access to more than 450 shelter occupants and emergency responders, including Florida Urban Search and Rescue Task Force 2, and international medical staff who had been unable to communicate with their families. When local power failed—rendering the shelter uninhabitable in the 95-degree heat—the MOVE team relocated to a new shelter, established for the displaced occupants.

- ★ MOVE continued to provide support for several days, as Red Cross communications assets arrived. It allowed MOVE to transition operations to a Red Cross Disaster Services Technology team, and complete their 40-day deployment on 20 October. Afterward, the volunteers returned home for much needed rest and refit.
- ★ MOVE volunteers held training sessions on 15 January, in Huntsville, Ala.; 25 March, in Atlanta, Ga.; and 19 April, in St. Petersburg, Fla.
- ★ The MOVE vehicle also provided community outreach and learning opportunities for students, and the general public in Science, Technology, Engineering and Math (STEM), at a number of events in 2018:

14 Jan.	Alabama Regional Future City Competition (Huntsville, Ala.)
22 Feb.	Union Intermediate School Maker Faire (Clinton, N.C.)
2-4 March	Red Cross Disaster Institute (Pamlico County, N.C.)
24 March	Atlanta Science Festival's Exploration Expo (Atlanta, Ga.)
27 March	Wellcome Middle School STEM Fair (Greenville, N.C.)
5 April	Red Cross STEM Event (Durham, N.C.)
10 April	Red Cross Triangle Chapter Volunteer Luncheon (Cary, N.C.)
28 April	Burlington Maker Faire (Burlington, N.C.)
29 April	UNC-Charlotte Science and Technology Expo (Charlotte, N.C.)
19 May	Cape Fear Preparedness and Safety Expo (Wilmington, N.C.)
1 June	School of the Future (Philadelphia, Pa.)

STEM OUTREACH



STEM Outreach—Atlanta Science Festival Exploration Expo—24 March



STEM Outreach at The School of The Future (Philadelphia, PA) on 1 June

HURRICANE FLORENCE (NORTH CAROLINA) 12 SEPTEMBER – 8 OCTOBER

Right: MOVE providing internet access at Lumberton Sr. High (20 September). This shelter had about 250 people displaced by the flooding. They had power and cell phone service, but no internet. The team stepped in and provided WiFi for the people staying there. In the first 3 hours of service, 69 users logged on and used about 1.6GB of data. This group included many students in the shelter who needed the internet to do their classwork.



Left: IEEE-USA volunteer Brian Greene setting up satellite communications to support Hurricane Florence recovery efforts (25 September)



The IEEE Hurricane Florence MOVE team (from left to right): Brian Greene, Grayson Randall, John Balsam, and Jay Diepenbrock



IEEE volunteers Brian Greene and John Balsam unloading communications equipment in Fayetteville, N.C. (16 September)

HURRICANE MICHAEL (9 OCTOBER – 21 OCTOBER)



Hurricane Michael Damage - Panama City, Fla., 13 October



Hurricane Michael Damage - Panama City, Fla., 13 October



MOVE partnering with Red Cross in Panama City (20 October)



Hurricane Michael Damage - Panama City, Fla., 14 October



IEEE MOVE Volunteer Tim Forrest providing on-the-go truck maintenance to ensure uninterrupted service (17 October)

SPONSORING TECHNICAL CONFERENCES

Working in partnership with IEEE Technical Societies, U.S. Regions and Sections, IEEE-USA sponsored, or technically co-sponsored, 13 IEEE technical/professional meetings in 2018:

- ★ The Global Women in STEM Leadership Summit (19-20 March)
- ★ IEEE Green Technologies Conference (GreenTech) (4-6 April)
- ★ North Atlantic Test Workshop (NATW) (7-9 May)
- ★ Photovoltaic Specialists Conference (PSC) (10-15 June)
- ★ National Aerospace and Electronics Conference (NAECON) (23-26 July)
- ★ Ubiquitous Computing, Electronics & Mobile Communications Conference (UEMCON) (18-20 October)
- ★ Global Humanitarian Technology Conference (GHTC) (18-21 October)
- ★ Int'l Symposium on Technologies for Homeland Security (HST) (23-24 October)
- ★ Conference on Technologies for Sustainability (SusTech) (11-13 November)
- ★ Int'l Symposium on Technology and Society (ISTAS) (13-14 November)
- ★ Women in Engineering Forum East (WIE Forum-East) (29 November-1 December)
- ★ Signal Processing in Medicine and Biology (SPMB) (1 December)
- ★ Wireless in Space and Extreme Environments (WiSEE) (11-13 December)

As part of its conference outreach, IEEE-USA also provided speakers, and/or arranged for the IEEE-USA booth to be present at the following 2018 events:

- ★ IEEE Rising Stars Conference (Las Vegas, Nev.) (8-10 January)
- ★ IEEE Region 4 and Region 6 Joint Meeting (San Francisco, Calif.) (3 February)
- ★ IEEE Region 2 Meeting (Lehigh Valley, Pa.) (24 February)
- ★ IEEE Region 1 Student Conference (Westbury, N.Y.) (23-24 March)
- ★ Awesome Con (Washington, D.C.) (30 March-1 April)
- ★ IEEE Region 5 Meeting (Austin, Texas) (6-8 April)



2018 IEEE-USA President Candy Robinson and IEEE-USA Social Media Associate Jonathon Choe, representing IEEE-USA, at 2018 WIE Forum East in White Plains, N.Y., 29 November-1 December.

- ★ IEEE PES Transmission and Distribution Conference and Exposition (PES T&D) (Denver, Colo.) (16-19 April)
- ★ IEEE SoutheastCon/Region 3 Meeting/ Student Conference (Tampa, Fla.) (20-21 April)
- ★ Bay Area Maker Faire (San Mateo, Calif.) (18-20 May)
- ★ IEEE PES General Meeting (PES GM) (Portland, Ore.) (5-10 August)
- ★ IEEE Region 1 Meeting (Burlington, Vt.) (10-12 August)
- ★ World Maker Faire New York (Queens, N.Y.) (22-23 September)
- ★ IEEE Technology Time Machine (San Diego, Calif.) (31 October-1 November)
- ★ Federal Energy Policy Summit (Washington, D.C.) (4-6 December)

Under the direction of 2018 Conferences Chair David Green, an assessment of the IEEE-USA Conferences Program was conducted in Spring 2018, and presented along with recommendations to the IEEE-USA Board of Directors (BOD), at its June meeting in New Brunswick, N.J. Taking into consideration the streamlining called for in the IEEE-USA Prioritization Plan—and the continuing need to expand revenue sources—the Board elected to continue IEEE-USA's involvement as a technical conference sponsor. However, the BOD directed the committee to reduce IEEE-USA's conference risk profile in the future, by electing for publishing partner arrangements—instead of financial co-sponsorship, where practical.



IEEE-USA volunteers and staff oversee the IEEE-USA booth at many of the technical conferences IEEE-USA co-sponsors, to educate attendees on IEEE-USA's products, programs, services and activities.



Above: 2018 Sustech attendee Zhen Yu, California State Polytechnic University at Pomona, speaks at a session on Intelligent Transportation Systems.

Right: A conference attendee tries out some VR goggles, at the Consumer Electronics Show, in January in Las Vegas, held in conjunction with the Rising Stars Conference.

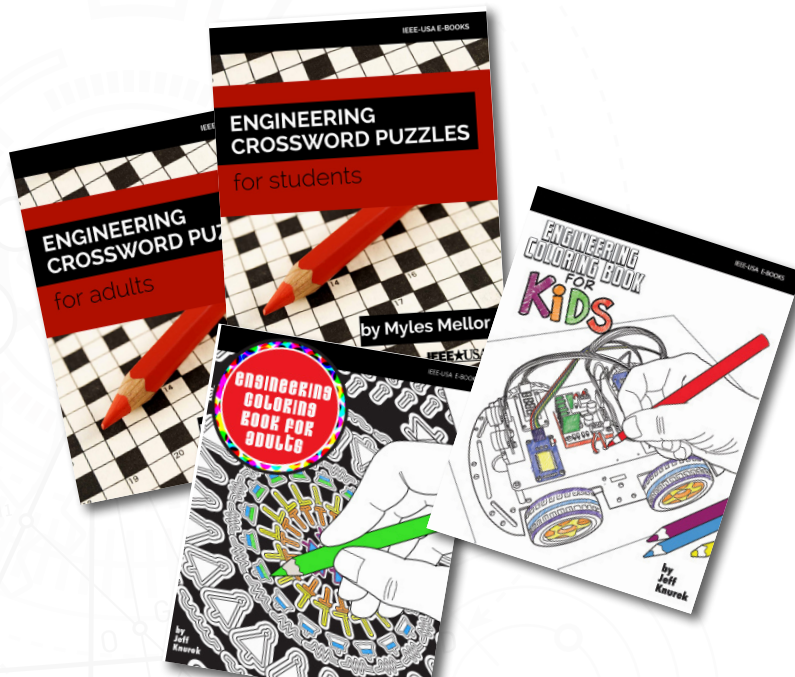


COMMUNICATING WHAT WE DO

IEEE-USA communicates regularly with IEEE's U.S. members through *InSight*, its online journal, the *InSight Email Update* (monthly), *IEEE-USA Future Leaders Connection* (monthly), *IEEE-USA Conference Brief* (quarterly), and *IEEE-USA Consultants Newsletter* (quarterly), as well as through our IEEE-USA website and via social media.

Following are some highlights from 2018:

- ★ In May, the new European GDPR rules went into effect, changing the way IEEE staff and volunteers are permitted to communicate with members and nonmembers. Since mid-2017, IEEE-USA staff has represented IEEE-USA in weekly IEEE GDPR Taskforce meetings; have overseen IEEE-USA's components of the overall IEEE-wide compliance efforts—including website modifications—to include explicit consent modules and cookie compliance banners; and developed of a set of procedures for day-to-day GDPR compliance requests.
- ★ In 2018, IEEE-USA published 126 new career, professional and public policy-themed articles in *IEEE-USA InSight*—an average of 10 articles per month. As a new feature for readers, *IEEE-USA InSight* also introduced engineering-themed crossword puzzles, posting new ones every Wednesday.
- ★ To strengthen engagement with IEEE's Young Professional members, IEEE-USA continued publishing its monthly *Future Leaders Connection* newsletter, sent to all U.S. Student Members and Young Professionals. This offering is mailed monthly to nearly 40,000 students and Young Professionals. The newsletter has a high open rate, at 31 percent. The career-related content shared in this newsletter is also promoted via our Future Leaders social media account and website.
- ★ In 2018, IEEE-USA published 14 new e-books on career and professional topics, bringing its collection to more than 250 titles, and generating YTD sales revenue of more than \$19,000 (surpassing total sales revenue for all previous years, since inception in 2005). A total of 5,120 e-books were also distributed to members for free in 2018, via monthly downloads of featured titles, as a member benefit.
- ★ IEEE-USA also continued to experiment with new e-books and formats in 2018. IEEE-USA released *Engineering Crossword Puzzles for Students*, an e-book by Myles Mellor, featuring a collection of 25 puzzles designed to introduce young minds to engineering concepts, as well as one for adults. In 2018, IEEE-USA also released engineering coloring books—for both adults and children.



- ★ IEEE-USA also released seven titles in audio-book format in 2018, generating 2,671 downloads over the course of the year.
- ★ IEEE-USA worked successfully with IEEE IT to integrate *IEEE-USA INSIGHT* and the IEEE-USA website as high-profile reader options in the new IEEE app.
- ★ To help keep members informed of IEEE-USA activities, benefits and services, and to engage them in IEEE-USA activities, IEEE-USA conducted the following email marketing campaigns:

- » *IEEE-USA InSight Email Update*: Nine Campaigns
Average Monthly Targeted: 105,000
Average Monthly Open Rate: 29 percent
- » *Future Leaders Connection*: Eight Campaigns
Average Monthly Targeted: 37,000 (students & YPs)
Average Monthly Open Rate: 31 percent
- » *IEEE-USA Conference Brief*: Three Campaigns
Average Monthly Targeted: 110,000
Average Monthly Open Rate: 27 percent

- ★ **Social Media Highlights:** IEEE-USA continues to emphasize social media as a tool for informing and engaging members. As measures of progress:

- » IEEE-USA added more than 3,150 new fans across Facebook, Twitter and Instagram in 2018, growing its fan base to over 27,000 in total, across the three platforms.
- » Audience growth for IEEE-USA's Instagram account—very popular among key younger demographics—has been particularly strong, with 98 percent fan growth in 2018.
- » IEEE-USA's Facebook, Twitter and Instagram accounts saw a combined 3.3 million impressions this year, including 1.3 million on Twitter, 1.8 million on Facebook and 164,000 on Instagram—the latter representing an increase of 272 percent YoY.

- » IEEE-USA has more than 55,000 total engagements from its Facebook, Twitter and Instagram accounts in 2018, including 18,400 from Twitter, 24,400 from Facebook and 12,800 from Instagram.
- » Engagement with IEEE-USA's Instagram posts has been especially high—approximately 250 percent more interaction per post, compared to Twitter and Facebook. People clicked links in IEEE-USA Facebook and Twitter posts more than 8,700 times in 2018 (Instagram does not allow clickable links within posts; so, we are unable to track the number of clicks on that platform).

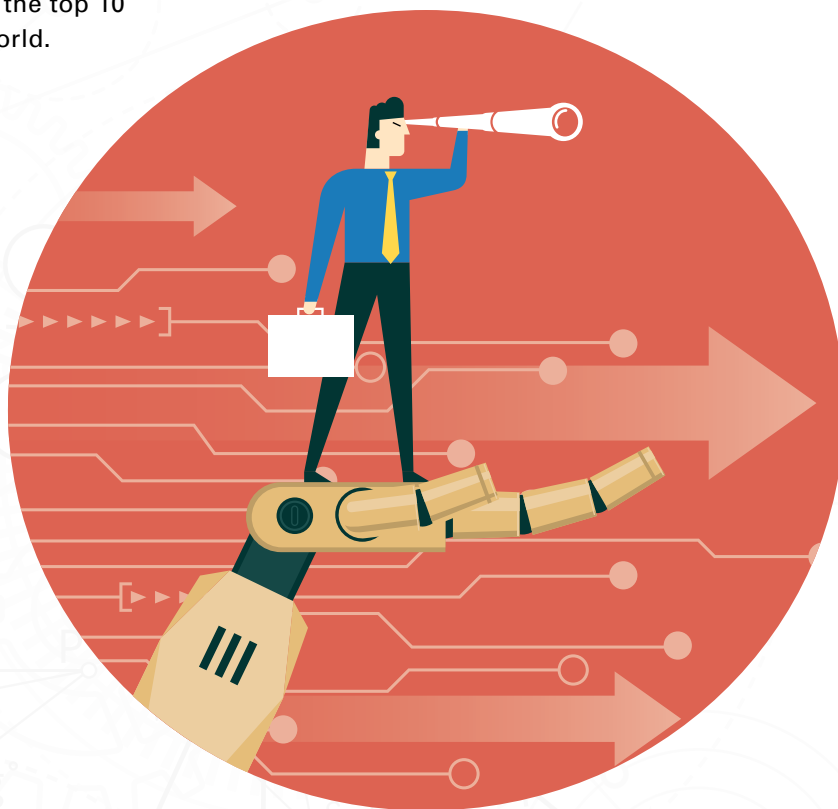
- ★ IEEE-USA Social Media Associate Victoria Bannon participated in a special “State of NASA” event for invited social media professionals on 12 Feb., at the Goddard Space Flight Center. In addition to touring the center, acting NASA Administrator Robert Lightfoot briefed participants, and he explored the work NASA is doing at Goddard—to send humans to space, create cutting-edge technologies, study our changing earth, and make progress on



Top/Bottom: WISE program participants also had a visit to NASA Headquarters Space Operations Center in 2018.

the next generation of air travel. The special invitation reflected the value that NASA placed on IEEE-USA social media communications in promoting NASA technology and programs.

- ★ IEEE-USA Communications was a key partner in supporting IEEE-USA's successful Future Leaders Forum, held 26-28 July in Austin, Texas. Among the services IEEE-USA's in-house Creative & Design team provided: a Motion Graphics Show Open Video (saving more than \$10,000, if outsourced), logo design, social media support, flyers, business cards, email marketing, promo items, pop-up picture opportunities, banners, table cloths, staging and backdrops, lighting, AV liaison, video editing and show production/emcee work.
- ★ The team also succeeded in getting the Future Leaders Forum listed on TechRadar's list of Top Tech Conferences in 2018, alongside heavyweights like CES, Mobile World Congress, FutureTech Expo and Google Cloud Next. TechRadar is one of the top 10 biggest tech news sites in the world.
- ★ In late October, the IEEE-USA Communications Committee hosted its first Young Professionals Rooftop Social in Washington, D.C. This activity is a pilot of an "in a Box"-type member engagement event that can be replicated several times a year in cities across the United States. These events will be open to 30-50 attendees, and will give members (and companions) opportunities to connect, socialize, and learn more about what IEEE does for them, in a relaxed, fun setting. Promotional items, table tents, drinks and light hors d'oeuvres were provided. Advanced registration and advertising took place online, via targeted email to the region the event is occurring.
- ★ Corey Ruth joined the IEEE-USA communications team in July, as our new Media Relations Associate. And Jonathon Choe joined our team as a full-time Social Media Associate, in November. IEEE-USA's Communications Team now has a full complement of six staff members, for the first time in two years.



As an adjunct to its communications program, and in addition to the MOVE outreach program, IEEE-USA engaged in a number of public outreach activities designed to promote awareness of the contributions of engineers to society. 2018 highlights include:

- ★ IEEE-USA co-sponsored the 26th annual Discover Engineering Family Day on 17 Feb., at the National Building Museum in Washington, where over 6,500 preteens, parents and teachers participated in activities designed to introduce children, aged 4-12, to the wonders of engineering. IEEE-USA and IEEE Educational Activities jointly promoted the TryEngineering Together mentorship program and IEEE-sponsored STEM summer camps during Discover Engineering Family Day.
- ★ IEEE-USA co-sponsored, provided judges and arranged for presentation of a special Communications Award at the Future City Competition finals, held 20 Feb., in Washington, D.C., during National Engineers Week. Approximately forty teams of 6-8th graders faced off with their designs for Age-Friendly Smart Cities of the Future.
- ★ IEEE-USA and IEEE-EA co-sponsored an IEEE booth, in support of the TryEngineering Together program at the U.S. Science and Engineering Festival, held 2-3 April, in Washington, D.C. IEEE staff and volunteers interacted with thousands of teens, children and families during the event, which drew an estimated 365,000 visitors. Also making an appearance at the Festival were members of Team Mid-Atlantic from Edlin School (Reston, Va.), the winners of the 2018 Future City Competition and recipients of IEEE-USA's Smart Grid Award, displaying their winning design for Halona, their future vision of Richmond, Virginia.
- ★ IEEE-USA was an exhibitor at WorldMaker Faire—New York, held 22-23 Sept., at the New York City Hall of Science. Staff and volunteers collaborated to showcase IEEE as part of the "East Coast's largest celebration of invention, creativity and curiosity." The event draws approximately 100,000 participants annually.



IEEE-USA volunteers and staff helped kids participate in a variety of STEM activities during Discover Engineering Family Day at the National Building Museum (17 February) in Washington, D.C., during National Engineers Week.

AMERICAN ASSOCIATION OF ENGINEERING SOCIETIES

IEEE-USA was a founding member of the American Association of Engineering Societies (AAES), a confederation of the major U.S. engineering disciplinary societies established in 1979, to advance the knowledge, understanding and practice of engineering.

Despite a major reorganization and downsizing efforts in recent years, AAES accumulated a substantial operating deficit, due to continued membership losses, and a rapid decline in AAES' publishing business. On 10 December, the AAES Assembly approved an AAES Board recommended dissolution plan. IEEE-USA and other member societies paid a final special assessment to cover legal costs related to preparing and filing a petition for dissolution. As a New York chartered corporation, AAES dissolution requires approval by the New York Attorney General, part of an on-going process that will continue into 2019.

Due to its anticipated dissolution, AAES limited its programmatic activity in 2018 to hosting its annual Awards Ceremony, in conjunction with the National Academy's Annual Convocation of Engineering Societies; and AAES International Affairs Committee (IntAC) member participation in the activities of the World Federation of Engineering Organizations (WFEO). AAES focused the balance of its energies on transitioning its awards and program activities to new sponsors.

APPENDIX I

2018 IEEE-USA BOARD OF DIRECTORS



Left to Right: Tarek Lahdhiri, Babek Behesti, Scott Tamashiro, John Walz, Kathleen Frammer, John Johnson, Peter Winokur, Candy Robinson, Bernard Sander, Tom Coughlin, Robert Shapiro (front), Greg Vaughn (back), Chris Brantley, Gloria See, Brendan Godfrey and Kate Duncan.

Pictured Separately: Karen Pedersen

APPENDIX II

2018 PRESIDENTIAL ENGAGEMENTS

In addition to chairing the IEEE-USA Board of Directors and overseeing the volunteer and staff structure responsible for implementing the activities described in this annual report, IEEE-USA President Candy Robinson represented IEEE-USA in a variety of outreach activities and events to advance IEEE-USA's member engagement and public visibility goals, including:

- Region 4-6 Meeting
(San Francisco) (2-3 Feb.)
- Iolani Palace IEEE Milestone Dedication
(Honolulu, Hawaii) (23 March)
- IEEE GreenTech Conference
(Austin, Texas) (4-6 April)
- Region 5 Meeting
(Austin, Texas) (6-8 April)
- National Academy Convocation of
Engineering Societies
(Washington, D.C.) (23 April)
- AAES Awards Banquet
(Washington, D.C.) (23 April)
- Engineering Societies Public Policy Symposium
(Washington, D.C.) (24 April)
- AAES Assembly Meeting
(Washington, D.C.) (24 April)
- SET Congressional Visits Day
(Washington, D.C.) (8-9 May)
- IEEE Honors Ceremony
(San Francisco, Calif.) (11 May)
- IEEE WIE Int'l Women's Leadership Conference
(San Jose, Calif.) (21-22 May)
- IEEE-USA Future Leaders Forum
(Austin, Texas) (26-28 July)
- Region 1 Board Meeting
(White Plains, N.Y.) (11-12 August)
- Dallas Section IEEE Day Luncheon
(Dallas, Texas) (2 October)
- IEEE Int'l Symposium on Technology and Society
(Washington, D.C.) (13 November)
- National Competitiveness Forum
(Washington, D.C.) (27-28 November)

2018 AWARDS AND RECOGNITIONS

IEEE-USA Award for Distinguished Public Service



The Honorable William Hurd (Texas-23)

For leadership in Congress advocating cybersecurity and technology legislation



The Honorable Ro Khanna (California-17)

For leading efforts in Congress to enact real digital privacy rights for internet users

IEEE-USA Robert S. Walleigh Award for Distinguished Contributions to Engineering Professionalism



John Paserba (Region 2)

For significant and sustained contributions to engineering professionalism and IEEE student member engagement

IEEE-USA Harry Diamond Memorial Award



Dr. Donald Steinbrecher (Region 1)

In recognition of groundbreaking work in broadband high dynamic range signals acquisition systems, and research establishing the U.S. Navy's leadership role in software defined electromagnetic signals receiving and transmitting systems

IEEE-USA Jim Watson Student Professional Awareness Achievement Award



James Peterman (Region 3)

For sustained leadership and active contribution to the IEEE Student Professional Awareness Program and student activities

IEEE-USA Entrepreneur Achievement Award for Leadership in Entrepreneurial Spirit



Dr. Duncan Moore (Region 1)

For extraordinary contributions in creating a far-reaching entrepreneurial culture for IEEE's U.S. Members

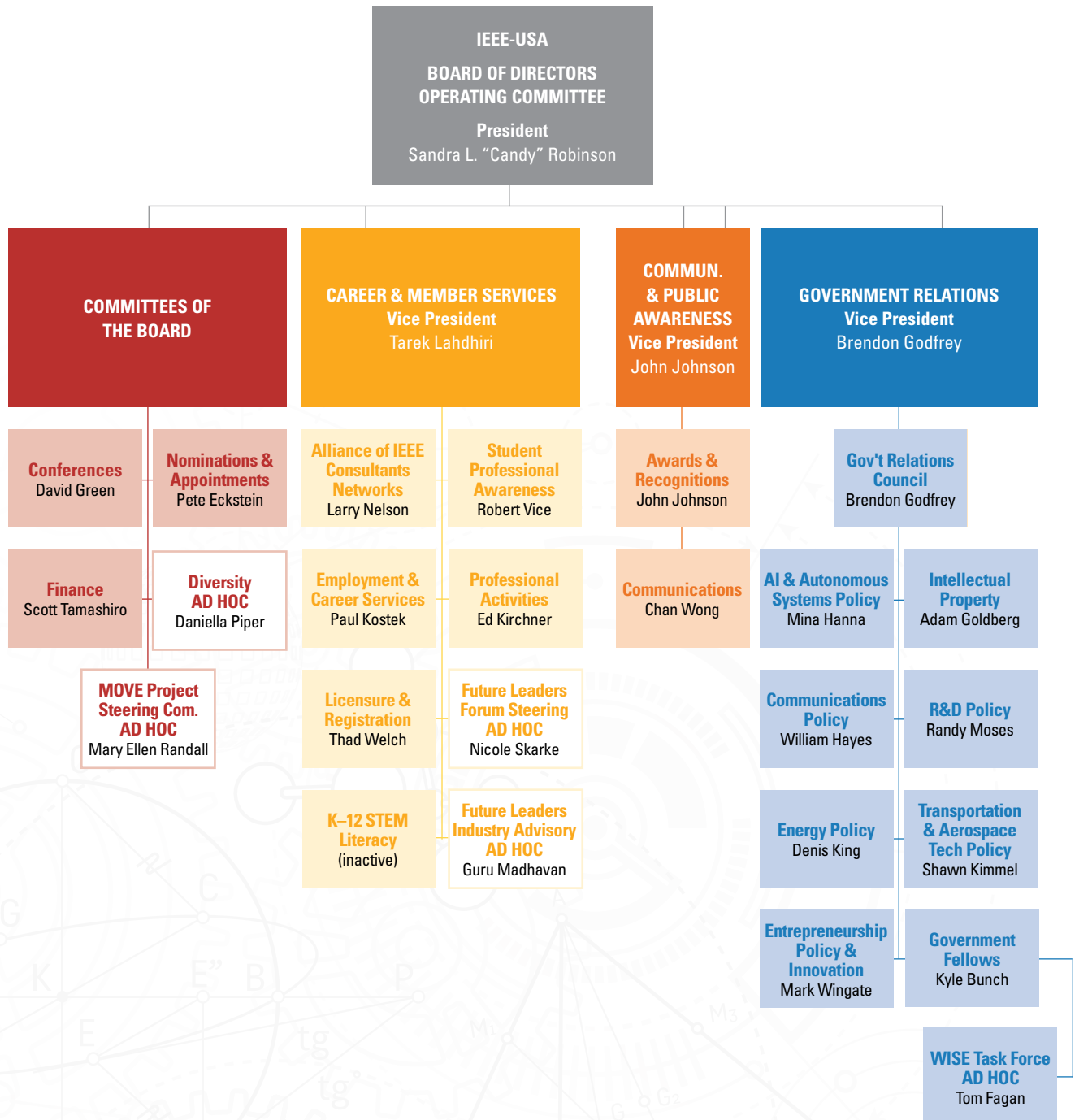
Award for Distinguished Literary Contributions Furthering Public Understanding and the Advancement of the Engineering Profession



Dr. Guru Madhavan (Region 2)

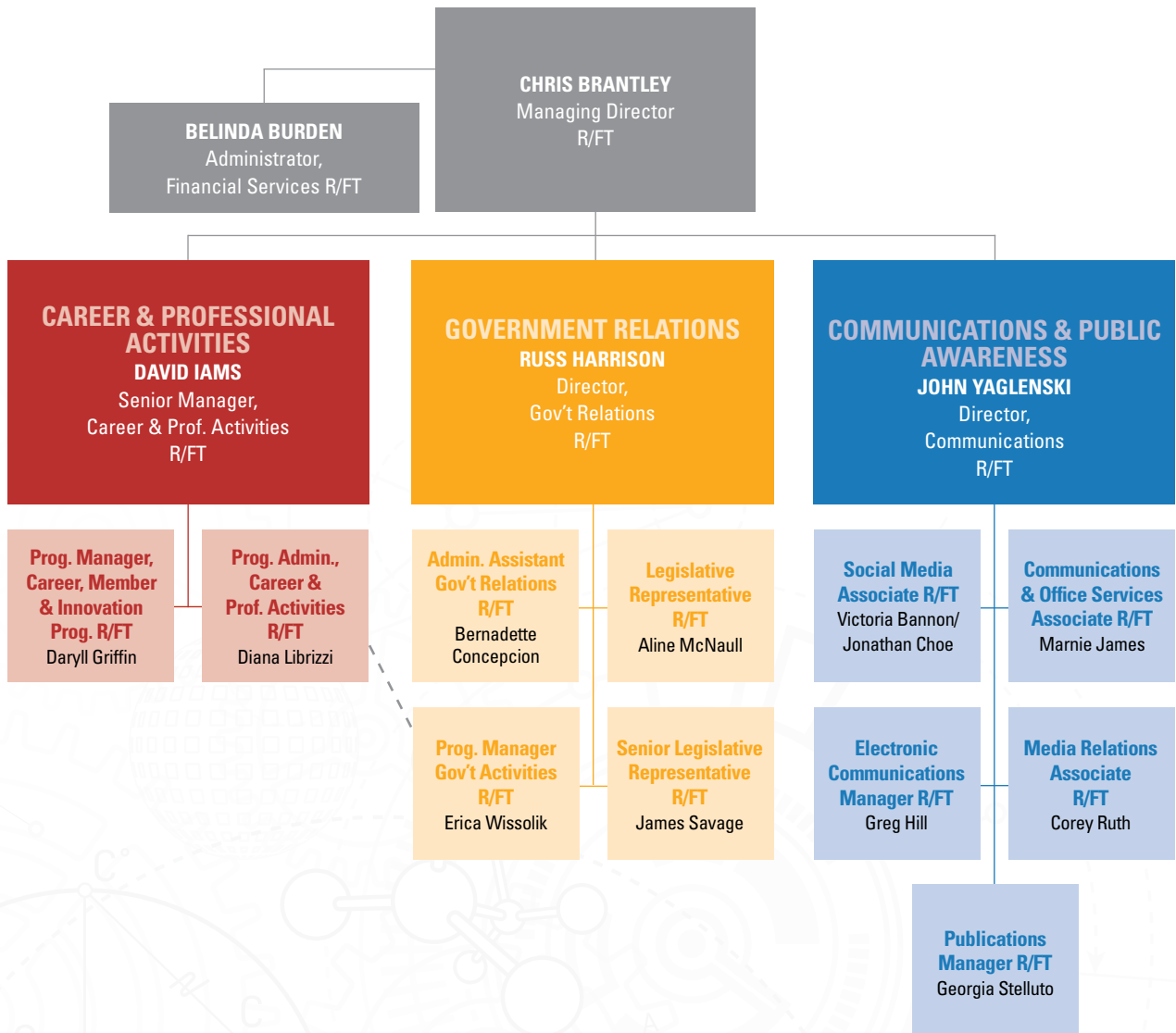
For outstanding contributions in enhancing public consciousness of the engineering profession through his book, "Applied Minds: How Engineers Think"

2018 VOLUNTEER ORGANIZATION



APPENDIX V

2018 STAFF ORGANIZATION



IN MEMORIAM

John Meredith, IEEE Life Fellow, director emeritus of the IEEE Foundation, former Region 5 director, and 2007 IEEE-USA President, passed away in September, after a brief illness. John gave decades of service as a volunteer, with a list of accomplishments a mile long.

He served on dozens of committees and boards at the section, region and national level, was active in the Communications and Circuits and Systems Societies, helped organize countless conferences and was honored with awards many times. John brought a wealth of experience from his years in the Navy, industry and academia, and he never gave up his passion for learning.

"John was a tireless IEEE volunteer, giving of his time and attention to serve our members in many ways," said Tom Coughlin, 2019 IEEE-USA President. "He consistently encouraged me to do more in IEEE, and was a mentor to many people who have become leaders and strong contributors in the organization. I will miss his suggestions and gentle encouragement, and I know others will as well. The world is better for John having been in it."

In memory of John Meredith's many contributions to the profession, and to IEEE-USA, the IEEE-USA Board of Directors authorized the creation of the IEEE-USA John Meredith Professional Service Award. This new award will recognize one key individual each year, for outstanding volunteer efforts or contributions, in support of IEEE-USA.



ABOUT THE ANNUAL REPORT

The *2018 IEEE-USA Annual Report* highlights the mission, goals and programs of IEEE-USA, and its activities and achievements in 2018. This Report was developed, produced and published as a benefit to members—to increase both member and non-member awareness of the programs and services IEEE-USA provides to advance the profession—and for the benefit of U.S. IEEE members. It also serves as a reference for members seeking information on specific programs or issues, or for those seeking opportunities to volunteer their time and expertise, in support of their profession.

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ABOUT IEEE-USA

IEEE-USA advances the public good and promotes the careers and public policy interests of nearly 160,000 engineering, computing and technology professionals, who are U.S. members of IEEE. With more than 423,000 members, in over 160 countries, IEEE is dedicated to advancing technological innovation and excellence, for the benefit of humanity.

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