



POWERING THROUGH TOGETHER

2020 Annual Report



IEEE

*Advancing Technology
for Humanity*

A Message to Our Community

2020 was a year like no other, filled with challenges—but also unexpected opportunities. As the COVID-19 pandemic rapidly spread across the globe, IEEE members and volunteers—and the organization as a whole—came together as one, actively responding to this threat with speed, agility and resourcefulness.

Though many IEEE members and volunteers were impacted by the pandemic, that did not stop them from pivoting their own work and joining the front lines. We express our heartfelt thanks to all who worked tirelessly to leverage technology to continue their work and conduct their research, in some cases in the development of vital treatments, tracing mechanisms and preventive measures.

IEEE, too, learned much from the experience. During this time of crisis, IEEE pulled together to keep the organization moving forward, adapting procedures to ensure our members and volunteers could stay engaged. We found new ways to connect, and, despite the loss of in-person contact, IEEE became more vital than ever.

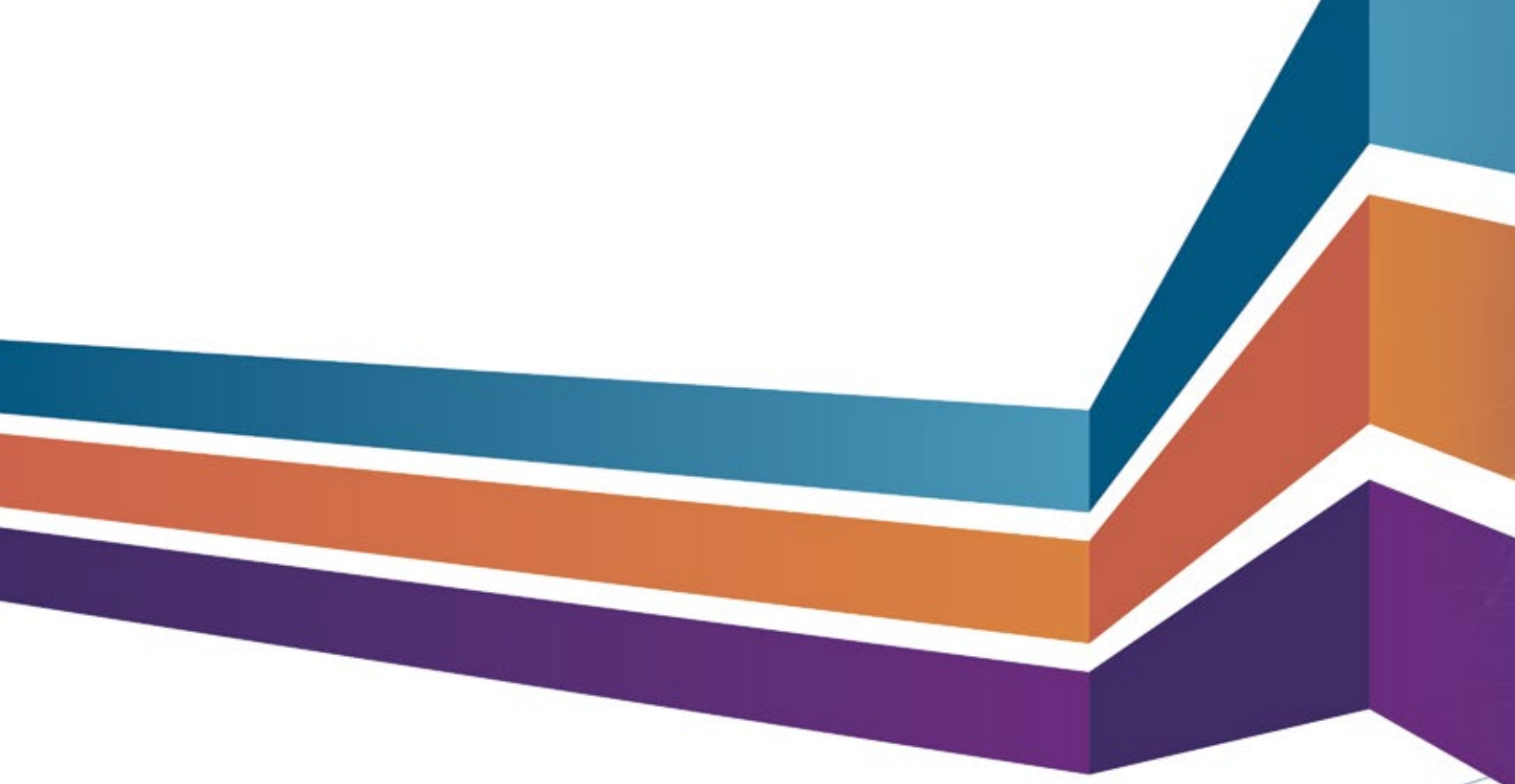
Throughout it all, IEEE remained true to our mission of advancing technology for humanity. Today, we are more committed than ever to sustaining this mission as we move confidently into the future—together.



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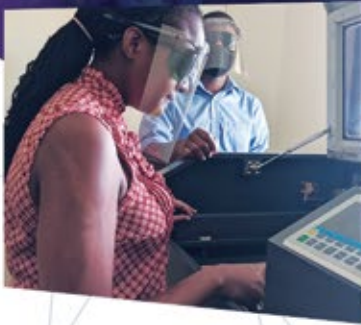


Powering Through Together

The COVID-19 pandemic brought together the power of the IEEE community across the globe to help humanity move forward.

IEEE took critical steps to keep the mission and work of our organization in motion. We reimagined in-person meetings and live events, while finding new ways to connect—from transitioning our conferences to virtual events to providing free access to a collection of COVID-19-related research articles and standards.

Despite the many challenges, IEEE remained nimble, resourceful and optimistic. As the world's largest technical professional organization, we hold an unwavering belief that we can overcome any obstacle and thrive during the most difficult of times. By meeting the occasion head-on and racing to find urgent solutions, IEEE members and volunteers helped to create the life-saving technologies that will lead to a healthier and more prosperous world.



Top Left: Project team members from the IEEE Uganda Section used 3D printing technologies to make face shields for frontline workers in its response to COVID-19. The project was funded by the IEEE Humanitarian Activities Committee (HAC) and the IEEE Special Interest Group on Humanitarian Technology (SIGHT).

Top Right: COVID-19 News and Resources Hub at IEEE Spectrum

Bottom Right: IEEE volunteer Daniel Falla
Photo Courtesy of National Grid



Above: Toshio Fukuda (left) and Stephen P. Welby pointing to their IEEE Fellow pins

Message from the IEEE President and the Executive Director

As we look back on 2020, we marvel at what has been 12 world-changing, paradigm-shifting months. In this year of unprecedented challenge, the mission of IEEE did not waver. We remained committed to fostering technological innovation and excellence for the benefit of humanity. We came together in new ways, faced the challenges of a global pandemic and emerged even stronger.

Throughout 2020, our international community of engineers, technologists, scientists and researchers continued to respond to the COVID-19 pandemic. This worldwide crisis brought with it public health challenges, global economic uncertainty and transformative lifestyle changes that will most likely have a lasting effect on not only business and markets, but also our attitudes and behaviors. Understanding the pandemic's far-reaching implications for IEEE required that we successfully navigate the financial and operational challenges of coronavirus while also rapidly addressing the impact on our members.

The role of IEEE became even more imperative: to facilitate the exchange of knowledge, advance the technical state of the art, promote guidelines and standards for professional excellence, and raise public awareness and recognition of our members' contributions.

Despite the loss of face-to-face opportunities and interaction, IEEE became more vital than ever in 2020. IEEE operations not only continued but intensified to meet the increased need for access to technical resources; the need for swifter dissemination of pandemic-related papers, a seamless transition to online platforms for conferences and events and, perhaps most importantly, embracing new ways to connect and communicate.

In response to the pandemic's challenges, we learned even more ways to use technology to work smarter and to reach wider audiences by engaging them how and where it worked best for them. We

supported the research and technology community with a historic number of journal papers and conference proceedings published. We replaced travel with virtual meetings and events. We supported our members with new models for outreach, turning local events into global ones. We made efforts to engage members in more languages than ever before.

IEEE continues to envision new opportunities and environments to ensure we are reaching our members wherever they are and meeting their transformed needs. We are focused on the capabilities that will ensure that our organization is as pioneering and agile as our members are. We will continue to look for ways to improve IEEE's products, our communications and our advocacy. We will also continue to engage the public, policymakers and the news media about the important work that our members and colleagues do each and every day.

Another promising development for IEEE is the ongoing evolution of its role within the field of continuing professional education and lifelong learning. It is imperative that IEEE be one of the driving forces within the area of professional development—taking advantage of the latest online platforms and our unique worldwide volunteer community, which can provide a local-content perspective from almost anywhere on the planet. Throughout 2020, we dedicated time, energy and expertise to this important topic.

In a year of unprecedented challenge and uncertainty, we've had the remarkable opportunity to witness IEEE's mission—advancing technology for the benefit of humanity—in action by our members, who are making significant improvements throughout society. Many IEEE members continue to be directly and indirectly engaged in the fight against this global pandemic—supporting biomedical research and applications, providing data analysis and modeling, maintaining critical communications and power

infrastructure and caring for each other. Their efforts have resulted in numerous technological innovations in a wide variety of sectors, including artificial intelligence and machine learning, robotics, cybersecurity, finance, health IT, logistics and agriculture.

The year certainly demonstrated the impact that professional engineers and technologists have on society. We witnessed amazing engineering developments and important medical and technological breakthroughs. We stayed connected and engaged, leveraging computing and communications to allow critical work to continue while keeping individuals and families safe. The challenges and changes we witnessed in local communities, across nations and around the world confirm that the work of professional engineers, technologists and educators, and young professionals and students preparing for technical careers, will continue to be in high demand and have significant societal impact.

Navigating the post-COVID environment will require adaptability, flexibility and innovation. We are confident that a future of promise and possibility lies ahead for the global professional community of IEEE. In the face of a global pandemic, IEEE members have changed our world—and we will continue do so every day.

Sincerely,



Toshio Fukuda 2020 IEEE President & CEO



Stephen P. Welby IEEE Executive Director & COO

IEEE BY THE NUMBERS

IEEE Xplore®
Digital Library

5,000,000+

Total Documents

192,262,982 Total Usage*

222,035

New Conference Articles

86,052

New Journal and
Magazine Articles

138

Standards Approved
for Publication

*PDF downloads and HTML views

396,007

Total Members

Top 5 Countries for Members



107,618

Student Members

Top 5 Countries for Student Members



Ten Regions Worldwide

Sections

342

**Student
Branches**

3,485

Chapters

2,562

1,611

IEEE Sponsored Conferences
in 96 Countries

465,000+

Conference Attendees
Virtual and In-Person



2020

IEEE Society Memberships

5,341	IEEE Aerospace and Electronic Systems Society	2,716	IEEE Magnetics Society
9,285	IEEE Antennas and Propagation Society	10,939	IEEE Microwave Theory and Techniques Society
1,626	IEEE Broadcast Technology Society	3,939	IEEE Nuclear and Plasma Sciences Society
11,087	IEEE Circuits and Systems Society	1,821	IEEE Oceanic Engineering Society
29,920	IEEE Communications Society	6,967	IEEE Photonics Society
8,162	IEEE Computational Intelligence Society	39,687	IEEE Power & Energy Society
49,978	IEEE Computer Society	10,210	IEEE Power Electronics Society
2,390	IEEE Consumer Technology Society	780	IEEE Product Safety Engineering Society
8,388	IEEE Control Systems Society	591	IEEE Professional Communication Society
1,914	IEEE Dielectrics and Electrical Insulation Society	1,552	IEEE Reliability Society
3,402	IEEE Education Society	14,801	IEEE Robotics and Automation Society
3,548	IEEE Electromagnetic Compatibility Society	18,347	IEEE Signal Processing Society
9,720	IEEE Electron Devices Society	1,720	IEEE Society on Social Implications of Technology
2,425	IEEE Electronics Packaging Society	10,165	IEEE Solid-State Circuits Society
9,301	IEEE Engineering in Medicine and Biology Society	5,114	IEEE Systems, Man, and Cybernetics Society
4,422	IEEE Geoscience and Remote Sensing Society	3,101	IEEE Technology and Engineering Management Society
9,456	IEEE Industrial Electronics Society	2,191	IEEE Ultrasonics, Ferroelectrics, and Frequency Control Society
12,877	IEEE Industry Applications Society	5,314	IEEE Vehicular Technology Society
4,042	IEEE Information Theory Society		
3,870	IEEE Instrumentation and Measurement Society		
2,105	IEEE Intelligent Transportation Systems Society	333,214	Total Society Memberships

53% of IEEE Members

Belonged to One or More Societies in 2020



*Top: Display screen of temperature values on μ Therm-FaceSense's temperature screening system
Photo Credit: Kornrawee Kaewmoon*

*Bottom: A self-driving vehicle delivers lunch boxes to workers in Pingshan District in Shenzhen, China.
Photo Courtesy of Unity Drive Innovation*



Innovating Over Obstacles

2020 was a year of unprecedented disruption. IEEE members adapted their work with determination, dedication and resolve to support efforts in the fight against COVID-19. *IEEE Spectrum*, IEEE's flagship magazine, shared a number of these inspiring stories throughout the year.



Modeling the Effectiveness of Preventive Measures

H. Vincent Poor, an IEEE Fellow and professor of electrical engineering at Princeton University in New Jersey, led a team of researchers in the development of a mathematical model that evaluates the impact of factors that can help limit the spread of COVID-19, such as mask wearing and contact tracing. The model also accounts for mutations in the virus.



*Above: H. Vincent Poor
Photo Credit: Sameer A. Khan/Fotobuddy*



Keeping Medical Workers Safe with 3D Printing

When the pandemic first hit, IEEE member Samantha Snabes responded by pivoting her 3D printing company to create personal protective equipment for medical workers. Snabes realized 3D printing was the ideal solution to bridge short-term supply gaps thanks to its ability to produce masks and shields at a faster rate than traditional manufacturing methods.



Above: The Gatekeeper camera component scans individuals, produces a visual image of each and displays their temperature. Photo Courtesy of Longan Vision



Using AR to Combat COVID-19

Before the pandemic hit, Canadian IEEE member Enzo Jia was busy developing an augmented reality visor with thermal imaging to help firefighters see through smoke. When COVID-19 began spreading in Canada, Jia and his colleagues realized they could use the same thermal imaging to check for virus symptoms. Specifically, they created an innovative device called Gatekeeper that can be mounted on a wall or tripod to measure the body temperature of up to five people at once. To date, units have been installed in long-term care facilities, grocery stores and universities.



Top: Augmented reality visor with thermal imaging camera Photo Courtesy of Longan Vision

Bottom: The Gatekeeper measurement component monitors the calibrated temperature of an area. Photo Courtesy of Longan Vision

Gatekeeper can measure the body temperature of up to 5 people at once



Hands-On Learning in a Virtual World

COVID-19 has forced universities around the world to hold classes remotely. IEEE Senior member Marco Winzker wasn't going to let that stop him from offering hands-on experimentation to his students. As the head of the Centre for Teaching Development and Innovation at Bonn-Rhein-Sieg University of Applied Sciences in Germany, Winzker made the decision to open up his remote lab to anyone in the world—allowing them to attend for free. The lab provides students across the globe with the opportunity to perform hands-on experiments with real hardware over the Internet, such as designing digital circuits.

More than 100 students from 30 countries attended the remote lab



Building and Repairing Ventilators to Help Patients

Volunteers from the IEEE Rio de Janeiro Section repaired more than a dozen broken ventilators used in public hospitals. To cover their expenses, the IEEE volunteers received US \$5,000 from the COVID-19 Fund sponsored by the IEEE Humanitarian Activities Committee (HAC) and the IEEE Special Interest Group on Humanitarian Technology (SIGHT). Meanwhile, members of the IEEE Kenyatta University Student Branch in Nairobi designed and built a low-cost ventilator for COVID-19 patients. The project addressed the shortage of mechanical ventilators in Kenya.

*Below: IEEE Rio de Janeiro Section volunteers [from left] Julia Neri, Neilson Dantas, Felipe Piancó, Alexandre Pinhel, Yuri Gabrich, and Wanderson Araújo
Photo Credit: Alexandre Pinhel*





Robot Vehicles Make Contactless Deliveries

IEEE Senior member Ming Liu helped ensure that needed groceries were safely delivered to communities under lockdown. Liu's Shenzhen-based startup developed a fleet of self-driving vans that delivered fresh produce to areas under quarantine. The vans made more than 2,500 autonomous trips in China. The unmanned vehicles provide a "contactless" alternative to regular deliveries, helping reduce the risk of person-to-person spread of COVID-19.

Above: A self-driving vehicle departs a distribution center to deliver fresh fruits, vegetables and other supplies to residents in Zibo, in the Shandong province of China.
Photo Courtesy of Unity Drive Innovation



Temperature-Screening System Increases Efficiency

IEEE Senior member Sarun Sumriddetchkajorn is part of a team of researchers at Thailand's National Electronics and Computer Technology Center that built a temperature-screening system called μ Therm-FaceSense. The system can check the body temperature of up to nine people at a time. More places are doing temperature screenings before entry, so the ability to scan several people at once can help eliminate long lines. Dozens of units were installed in hospitals, correctional facilities and public transportation systems throughout the country.



**Scans up to 9
people at once**

Right: Developed by researchers in Thailand, the temperature-screening system μ Therm-FaceSense uses a visible camera, a thermal imaging camera, Lidar and facial recognition technology.
Photo Credit: Kornrawee Kaewmoon





Center: Volunteers from the IEEE Kyambogo University Student Branch IEEE SIGHT Group in Uganda designed and created 3D-printed devices with IEEE HAC and SIGHT funding to help frontline workers avoid touching high-contact places such as door handles and elevator buttons.

Bottom Left: COVID-19 News and Resources Hub at IEEE Spectrum

Bottom Right: In the IEEE Rio de Janeiro Section, a project team used HAC and SIGHT funding to train volunteers to repair hospital machinery, such as ventilators, working in partnership with local universities, professional associations, industry representatives and the Brazilian government.



Supporting Our Members and Volunteers

IEEE's response to the COVID-19 pandemic was instantaneous. The first in-person conference was postponed on January 24. By early March all in-person meetings were eliminated and the first large virtual conference was organized. We also launched the IEEE COVID-19 News and Resources Hub to deliver critical resources from across IEEE to assist our members and volunteers and highlight their technology developments to fight the virus.



- **1,700+**
Events went virtual or hybrid
- **1,549**
Virtual Events
- **162**
Hybrid Events

Above: IEEE member Benoit Pelletier, 2020 5G World Forum keynote speaker

IEEE Conferences Pivot

As the virus spread IEEE quickly took action, engaging conference organizers to navigate them through the process of shifting to a virtual format. IEEE was able to leverage the Digital Event Center of Excellence, which it had developed long before the pandemic. This resource presented alternatives to conference organizers who were evaluating contracts, finances, digital models and pathways for publishing the important research at the heart of many of IEEE's events.

The Meetings, Conferences and Events team produced over 50 virtual conferences at no charge. They also provided platforms and materials for organizers to produce another 50 events, again at no charge. 2020 conferences included:

IEEE International Conference on Acoustics, Speech and Signal Processing

- Transitioned to virtual within six weeks:
16,000 attendees, **12,000** of whom attended for the first time

2020 Virtual 5G World Forum

- Program included sessions, speakers and tutorials:
728 attendees from **49** countries

IEEE International Conference on Computational Electromagnetics

- First hybrid event, which implemented specific protocols to keep attendees safe, including divided meeting rooms to ensure social distancing requirements were met

Conference Organizers Rise to the Occasion

By mid-February, COVID-19 was affecting the planning of nearly every one of IEEE's almost 2,000 conferences. But conference organizers rose to the challenge. IEEE Senior member Humphrey Muhindi worked with IEEE staff to pivot IEEE PowerAfrica 2020, held in August, from an in-person to a virtual conference within three months. Despite the obstacles, the conference, which he co-chaired, delivered 60 different sessions and saw its highest number of registrations and presented technical papers.

Right: IEEE Senior member Humphrey Muhindi, PowerAfrica Conference General Co-Chair

Below: Virtual PowerAfrica Platinum Sponsor Session during the 2020 IEEE Power & Engineering Society and IEEE Industry Applications Society PowerAfrica Conference



COVID-19 Resources for Members

IEEE created the COVID-19 News and Resources Hub, which compiled products, services, courses and tools to help IEEE members during the pandemic. As the organization made existing and new resources available, they were immediately populated to the Hub. In-depth coverage of IEEE members developing cutting-edge technologies and solutions to combat the spread of coronavirus were also reported by *IEEE Spectrum*.

IEEE-USA, an organizational unit created in 1973 to support the career and public policy interests of IEEE's U.S. members, launched the "Here to Help" campaign featuring online content and resources to assist members during the COVID-19 crisis. The campaign included everything from an online panel discussion on how job seekers can stand out in a virtual world to tips and tricks on how to stay active at home when gyms are closed. IEEE-USA also made its ebooks free to all IEEE members worldwide.



2.29 million

Page views



1.66 million

Visitors

Right: COVID-19 News and Resources Hub at IEEE Spectrum





IEEE Provides Free Access to COVID-19-Relevant Research and Standards

IEEE provided free access to a collection of COVID-19-related research articles and standards. Included were COVID-19-related papers and standards in the IEEE *Xplore*® Digital Library on topics such as using artificial intelligence for health diagnostics, telemedicine and the use of robotics in laboratories.

IEEE *Xplore*®
Digital Library

IEEE Societies Fast-Track Valuable Content

The IEEE Engineering in Medicine and Biology Society created a fast track for the rapid review and publication of research and data that could help in the fight against COVID-19. The Society committed to an expedited peer-review process that ensured high-quality, relevant papers were disseminated in a matter of days, rather than months, to clinicians and engineers working on the front lines.

The IEEE Power & Energy Society also delivered a global report, "Sharing Knowledge on Electrical Energy Industry's First Response to COVID-19," featuring insights on how the industry worked to keep the lights on during the pandemic. The report delved into the steps that electric utilities and system operators took to mitigate the effects of the pandemic and provide safe and reliable power to their communities.





IEEE Sections Congress 2020 Goes Virtual

Pivoting to an all-virtual format, IEEE Sections Congress provided an opportunity for more than 350 volunteers from across the globe to review recommendations that focused on improving membership activities. Recommendations were received from all 10 IEEE Regions, and covered a variety of topics ranging from providing continuing education programs to engaging with local industry leaders. The virtual training portion of Sections Congress was rescheduled to 2021.





Top: IEEE student volunteers from the Kyambogo University Student Branch in Uganda and its IEEE SIGHT Group in Uganda hold a planning session about the design of 3D-printed door-opening devices to help frontline workers avoid touching high-contact places in their daily routines. Funding from IEEE HAC and SIGHT allowed them to make over 800 devices.

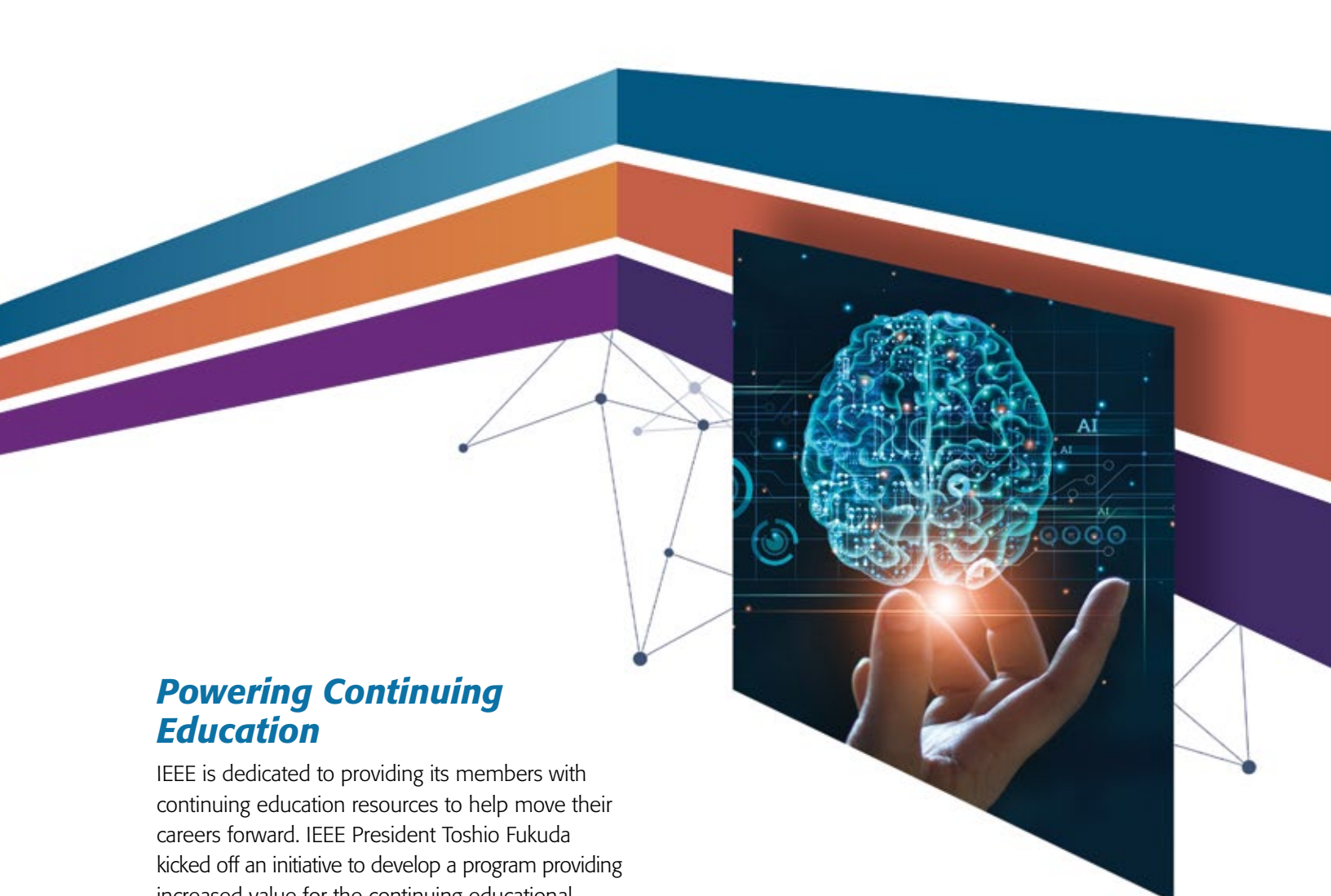
Center: A student enrolled in the TryEngineering program working on soldering a circuit

Bottom: As a part of TryEngineering Together eMentoring, STEM professionals support student STEM learning in this virtual TryEngineering Live event.



Commitment to Lifelong Learning

IEEE continued to support its members throughout the pandemic by offering resources to help them advance professionally—whether they are young professionals just beginning their careers or higher-grade members.



Powering Continuing Education

IEEE is dedicated to providing its members with continuing education resources to help move their careers forward. IEEE President Toshio Fukuda kicked off an initiative to develop a program providing increased value for the continuing educational needs of IEEE members and technical professionals. Specifically, IEEE created the role of “Educator-in-Chief” in each of the key areas of artificial intelligence, internet of things and smart grid to help identify and develop content and resources to support lifelong learning opportunities.



42,272

Registrants



13,210

Attended in Real-Time



60+

Virtual Events



16,508

On-Demand Views

IEEE Embraces Virtual Learning

In 2020, IEEE developed creative responses to the pandemic, including the launch of more than 60 free educational webinars produced by IEEE Educational Activities and designed for students, faculty and technical professionals. Many people used their extra time at home to engage in virtual learning and stay current on the latest technology trends. 2020 also brought record usage of IEEE online courses.



Above: Virtual participants of the Region 10 2020 Student, Young Professionals, Women in Engineering and Life Member Congress



IEEE Engages with Young Professionals Across the Globe

In 2020, IEEE continued its work to include more young professionals in the organization's leadership, as well as fostering greater geographic diversity.

One event to support these efforts was the Region 10 Student, Young Professionals, Women in Engineering and Life Member Congress, which was held virtually. The theme was "Pandemic to Opportunity—Collaborative Leadership Toward Technology Advancement for Humanity." The Congress enabled students and young professionals to explore new modes of collaboration and discover meaningful ways to advance technology both during and after the pandemic.



Top: Volunteers from the IEEE Uganda Section IEEE SIGHT group install a solar panel at the Mukujju Health Center to improve its ability to offer quality medical care to the local community.

Bottom Left: IEEE MOVE truck outside the disaster relief operation headquarters in Nashville, TN

Bottom Right: Volunteers from the IEEE Uganda Section used funding from IEEE HAC and SIGHT to make over 3,300 3D-printed face shields for frontline healthcare workers (some of whom are pictured here) and assist their country in its response to the COVID-19 pandemic.



Advancing Technology for Humanity

Despite the pandemic, technology and innovation continue to move forward. Throughout the year, IEEE worked to ensure that technology professionals had the information they needed to pursue innovation and develop solutions that benefit people everywhere.

IEEE Defines an Ethical Approach to Artificial Intelligence

The IEEE Standards Association (IEEE SA) completed the first phase of its efforts in autonomous and intelligent systems certification. This work is focused on developing critical certification criteria for responsible innovation and delivery of autonomous and intelligent systems. IEEE invited companies, governments, public bodies and other interested stakeholders to engage in the second phase of work, which is aimed at deploying trustworthy systems in business-to-business, business-to-consumer and business-to-government environments.

Extending Knowledge in Quantum Technologies

IEEE-USA, with support from the IEEE Quantum Initiative, IEEE's leading community for all projects and activities on quantum technologies, was proud to be a founding partner of a new quantum education initiative sponsored by the White House Office of Science and Technology Policy and the National Science Foundation. The new Q-12 Education Partnership program helps teachers incorporate lessons on quantum science and quantum engineering into their curricula—all packaged in one easy-to-navigate website.

To share the latest research on this rapidly emerging topic with the technology community, IEEE hosted a Virtual IEEE International Conference on Quantum Computing and Engineering (QCE20) event. The inaugural five-day event, IEEE Quantum Week, served as a showcase for quantum research, practice, applications, standards, education and training. More than 270 hours of high-quality content was delivered to 2,500 audience members who ranged from “new to quantum” to “quantum experts.”

Below: Dashboard of a virtual room at the 2020 Virtual IEEE International Conference on Quantum Computing and Engineering





*Top Left: Student members from the Zambia Section IEEE SIGHT Group designed, produced and distributed 10,000 high-efficiency, reusable face masks.
Top Right: Volunteers from the IEEE Uganda Section conducted a project to reduce the spread of COVID-19 in the Imvepi Refugee Settlement Camp.
Bottom Left: The Malaysia Section IEEE Engineering in Medicine and Biology Society Chapter prepared a structure that decreases the chance of spreading the coronavirus between dentists and hygienists and their patients.*

IEEE SIGHT Grant Program Supports COVID-Related Projects

The IEEE Humanitarian Activities Committee and Special Interest Group on Humanitarian Technology (SIGHT) held a special call for IEEE member proposals to support grassroots humanitarian technology and sustainable development projects. The more than 100 funded projects include:

The IEEE Malaysia Section IEEE Engineering in Medicine and Biology Society Chapter received funding to create a device that limits the spread of patient aerosols generated during dental appointments. The device allows dentists to work with patients while maintaining a higher degree of safety. Over 150 devices were distributed to a government hospital and clinics in Malaysia.

The IEEE Uganda Section received funding for its project that used 3D printing technologies to assist the country by addressing the lack of medical supplies. The team produced 3D-printed face shields and made them available to front-line health workers.

The IEEE Zambia Section SIGHT Group used its funding to design, produce and distribute reusable face masks. They also created educational materials on measures to reduce the spread of the virus and shared them with community members.

Additionally, IEEE India, in collaboration with the India Council, put out a call for proposals to address and mitigate the COVID-19 pandemic. The result was the funding for Virobot, a robotic nurse designed to assist doctors and caregivers while attending to COVID-19 patients.



United Nations Grants IEEE Consultative Status in Sustainable Development Efforts

IEEE received consultative status with the United Nations Economic and Social Council (ECOSOC) in 2020. ECOSOC is at the heart of the United Nation's efforts to advance the three dimensions of sustainable development—economic, social and environmental. This approval recognizes IEEE's contributions to sustainable development and humanitarian technology, supporting the achievement of the UN Sustainable Development Goals and provides further opportunities to contribute to these efforts.

President Fukuda Delivers Keynote Address to Chinese Scholars

IEEE President Toshio Fukuda delivered the keynote address at the 22nd Annual Meeting of the China Association for Science and Technology (CAST). This was a high honor as President Fukuda was the only international keynote speaker at the event.

Right: Photo courtesy of CAST



Bridging the Gap Between Standards Developers and Technical Communities

This year saw the introduction of IEEE SA OPEN, an open-source collaboration platform that provides support and services for open-source projects, including projects related to standards development, community projects, projects undertaken by industry consortia and projects sponsored by industry for the benefit of humanity. IEEE SA OPEN is designed to bridge the gap between standards developers and other open technical communities to enable nimble and creative technical solutions. The platform, which includes source code management, collaboration, testing and other tools that are available to Open Community Projects at no charge, was used in the development of standards in 2020.

MOVE Truck Assists in Recovery Efforts

IEEE's MOVE (Mobile Outreach Vehicle) truck responded to five natural disasters impacting multiple regions of the U.S. The mobile emergency relief program provides disaster victims and Red Cross volunteers with a range of services including cell phone charging, Wi-Fi access, technical support and power and lighting supply. Even during COVID-19, IEEE was ready to help. The MOVE truck was fully equipped with personal protective gear and volunteers were trained on the appropriate protocols for operating in a pandemic.

Right: IEEE MOVE truck preparing to deploy during Hurricane Isaias







Expanded Offerings in Open Access Provide Diverse Publishing Options

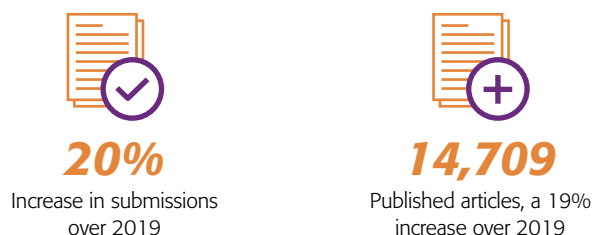
IEEE is a global leader in open access publishing in engineering, computer science and technology, offering multiple tools and publishing options that support research reproducibility. These efforts ultimately enable engineers to make new discoveries and build the next generation of technology.

New Gold Fully Open Access Journals Added to IEEE Portfolio

To support the growing interest in open access publishing, IEEE continues to launch additional open access journals, providing more publishing options for researchers and authors seeking to share their work with a broader audience. In 2020, IEEE added 14 new gold fully open access journals to its open access publishing portfolio, with 13 meeting or exceeding their article publishing goals.

IEEE Access® Makes Major Strides

The multi-disciplinary open access journal continued to grow in 2020:



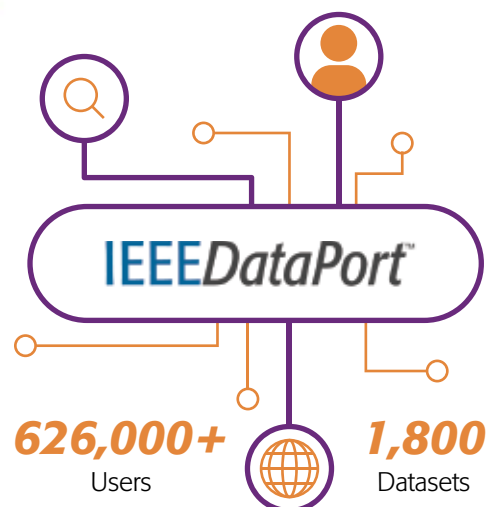
IEEE Access continues to have a quick turnaround time for authors, with an average article submission-to-publication time of just four weeks.

IEEE Forges First Read and Publish Agreement

IEEE inked its first Open Access Read and Publish agreement with the University of Illinois, a leading institution for engineering research. Under the agreement, researchers have access to IEEE's premier collection of journals, conferences and standards via the IEEE *Xplore* Digital Library and are able to publish articles via open access—free and available to be read by the general public—without having to be responsible for article processing charges.

Journal Article Garneres Major Media Coverage

A study published in the *IEEE Open Journal of Engineering in Medicine and Biology* by a team of MIT researchers earned the attention of major media outlets, including *Fortune*, *Psychology Today* and *USA Today*. The researchers behind the study were able to build artificial intelligence models that accurately detect virus infection in COVID-19 patients using a voice recording of their cough. The pandemic further demonstrated the importance of open access publishing, allowing free access to groundbreaking, timely research.



In Support of Open Science

IEEE DataPort Sees Gains in 2020

IEEE DataPort continued to experience strong growth in 2020, reaching more than 626,000 users and 1,800 datasets. IEEE DataPort is an accessible online data platform that allows users to store, search, access and manage datasets of up to two terabytes across a broad range of topics. The platform also helps technologists analyze datasets while supporting open data initiatives that keep referenceable data available for reproducible research.



*Top Right: A student participating in a TryEngineering activity soldering a drone
Bottom Right: IEEE Xtreme 14.0 coding competition participants from An-Najah National University, West Bank, Palestine*



Elevating Engagement

IEEE members and volunteers are passionate about advancing technological innovation to inspire change and make the world a better, more prosperous place for everyone. In 2020, despite the circumstances, IEEE engaged deeply with the global community and we strengthened our outreach efforts around the world, offering to members opportunities that were inclusive and accessible to all.

IEEE Keeps Student Members Engaged

IEEE kept student members engaged in the organization throughout the pandemic, even though they were not able to meet on campus. IEEE offered various remote workshops, socials and other events during the year to help prepare student members academically and professionally. At the University of California, Los Angeles, IEEE student member Bryan Wong organized a hackathon for students, as well as an alumni career panel and a hands-on soldering workshop—all held remotely.

IEEE Members Share Technology Solutions

Top-tier media outlets turned to IEEE members for expert insight into how technology can help society adapt during the pandemic. Some examples include:

IEEE Fellow Karen Panetta was featured in an *NBC News* story that discussed how human-robot cooperation is enabling society to combat COVID-19 via improved cleaning and disinfecting capabilities.

IEEE member Antonio Espingardeiro spoke with *The Engineer* about how COVID-19 has accelerated the broad implementation of AI and robotics, and why this trend is likely to become more prevalent in the future.

IEEE member Mario Milicevic was featured in *MarketWatch* discussing how the tremendous bandwidth demands resulting from so many people working and learning from home during the pandemic are impacting the internet's ability to function properly.

IEEE member Carmen Fontana was quoted in *InformationWeek* about the importance of cloud technology in a post-COVID world.

Below: Sample of news coverage featuring IEEE member insights





Above: IEEE Day 2020 virtual participants from the IEEE Cairo University Student Branch in the IEEE Egypt Section

IEEE Day Hosts Virtual Global Celebration

IEEE continued its IEEE Day tradition to showcase how the world advances technology for a better tomorrow. For the first time in its 11-year history, IEEE Day held all its events virtually. The commemoration included personal testimonials from IEEE members and volunteers discussing how IEEE has enhanced their careers.



IEEE App Makes It Easy to Stay Connected

The IEEE App, which gives members and the general public the ability to engage with all things IEEE, reached over 375,000 downloads in 2020. Given the unprecedented nature of 2020, it was more important than ever to stay up-to-date with the latest news on technological advancements. The IEEE App made it easier for people around the world to stay connected and learn about the many opportunities IEEE offers around the world.

375,000+
Downloads in 2020



An Ongoing Commitment to Diversity and Inclusion

IEEE's 2019 diversity and inclusion efforts carried over into 2020 with the approval of an updated IEEE Code of Ethics. The changes incorporate high-level principles that include a commitment to uphold the highest standards of integrity and ethical conduct in professional activities, as well as to treat all persons fairly and with respect and to not engage in harassment or discrimination.



Above: IEEE President Toshio Fukuda (left) and NEC Chairman of the Board Nobuhiro Endo at the dedication ceremony of two IEEE milestones in Tokyo, Japan, in December 2020.



Notable Achievements

IEEE has actively shaped the future of technology—and the world—by tirelessly advancing innovation and technological excellence. In 2020, IEEE honored numerous leaders across multiple disciplines whose achievements sparked radical transformation and made our planet a better, more sustainable place to live. Additionally, 282 IEEE members with extraordinary accomplishments were elevated to IEEE Fellow status.



Top Left: IEEE Life Fellow and Medal of Honor Recipient Chenming Hu

Top Right: Front display of the Medal of Honor and the IEEE Simon Ramo Medal

Chenming Hu Receives IEEE Medal of Honor

Sponsored by the IEEE Foundation, the Medal of Honor is IEEE's pinnacle of recognition. In 2020, it was awarded to IEEE Life Fellow Chenming Hu, a professor at the University of California, Berkeley, for "a distinguished career of developing and putting into practice semiconductor models, particularly 3-D device structures that have helped keep Moore's Law going over many decades." Hu's pioneering achievements in transistor models and novel transistor structures have enabled the continued scaling of semiconductor devices, ultimately leading to the production of smaller, less expensive and more powerful computers and electronic devices.

Space Pioneers Awarded Prestigious IEEE Simon Ramo Medal

Dr. B.N. Suresh and Dr. K. Sivan of the Indian Space Research Organization received the prestigious 2020 IEEE Simon Ramo Medal. The two recipients were recognized for "their outstanding leadership in developing the national space program of India and for pioneering space technology."

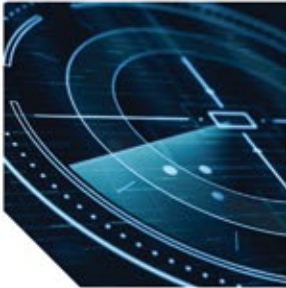
IEEE History Center Celebrates 40th Anniversary

In 2020, the IEEE History Center celebrated its 40th anniversary. The mission of the IEEE History Center is to preserve, research and promote the history of information and electrical technologies. Industry luminaries, including IEEE President Toshio Fukuda and IEEE Past President José Moura, gathered virtually to raise a toast to the IEEE History Center.



Honoring Historic Technology Milestones

Each year, the IEEE Milestones in Electrical Engineering and Computing program recognizes exceptional technical achievements that occurred at least 25 years ago. In 2020, four Milestones were dedicated, including:



1921-1923

Piezoelectric Quartz Oscillator

Middletown, Connecticut

Piezoelectric quartz oscillators advanced ultrasonics, sonar, radar and myriads of other electronic applications, and appeared in everyday life through their use in quartz wristwatches.

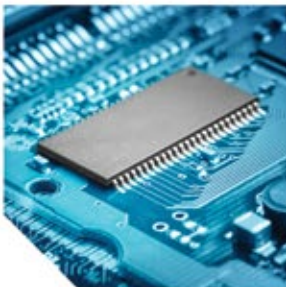


1971

Demonstration of the ALOHA Packet Radio Data Network

Honolulu, Hawaii

ALOHAnet was the first network to demonstrate that communication channels could be efficiently shared on a large scale, leading directly to the development of Ethernet and personal wireless communication technologies.



1980

First Commercial Digital Signal Processor Chip

Kawasaki, Japan

NEC developed the first commercially available, programmable digital signal processor chip, accelerating the adoption of digital signal processing in communications and broadcasting.



1982

First Operational Large-Scale Latent Fingerprint Identification System

Tokyo, Japan

NEC introduced the world's first large-scale automated fingerprint identification system (NEC AFIS), equipped with a latent fingerprint matching function that enabled the world's police agencies to expedite searches for suspects.



Above: Photo taken February 2020

2020 IEEE Board of Directors

Back Row from left

Tapan K. Sarkar*, Keith A. Moore, Jason J. Gu, Kukjin Chun, Alfred E. Dunlop, Thomas M. Conte, Manuel Castro, Wolfram Bettermann, James M. Conrad, Elizabeth Burd

2nd Row from left

Stephen P. Welby, Ljiljana Trajković, Stephen M. Phillips, Akinori Nishihara, Theodore "Ted" W. Hissey, Kazuhiro Kosuge, David A. Koehler, James R. Look, Eduardo F. Palacio, Joseph V. Lillie, Jill I. Gostin, John P. Verboncoeur

Front Row from left

Alberto Sanchez, Rabab Kreidieh Ward, Miriam P. Sanders, José M.F. Moura, Toshio Fukuda, Susan K. (Kathy) Land, Robert S. Fish, Kathleen A. Kramer, Magdalena Salazar-Palma, David B. Durocher

**IEEE thanks 2020 IEEE Director and Vice President, Publication, Services, and Products Board Dr. Tapan Sarkar for his years of service to the IEEE community. Sadly, Dr. Sarkar passed away in 2021. He will be missed by his colleagues and friends within the IEEE community.*

Not pictured: Sergio Benedetto



Above: Photo taken October 2020

IEEE Management Council

From left

Karen L. Hawkins, Donna Hourican, Steven Heffner, Jamie Moesch, Stephen Welby,
Thomas R. Siegert, Cherif Amirat, Mary Ward-Callan, Cecelia Jankowski

Not pictured: Chris Brantley, Konstantinos Karachalios, Sophia A. Muirhead

MESSAGE FROM THE TREASURER

2020 was an unprecedented year with COVID-19 disrupting all aspects of daily life. Yet, through it all, IEEE pulled together as an organization and kept moving forward by being agile and responsive with its activities, such as transitioning many of its in-person conferences to virtual or hybrid events. IEEE continues to focus on its mission of advancing technology for the benefit of humanity.

I am pleased to present the audited financial reports of IEEE. These reports indicate that the overall financial health of the organization remains strong, with total assets of US \$917.9 million exceeding total liabilities of \$252.6 million as of December 31, 2020.

The IEEE Statement of Activities reflects total revenues for 2020 of \$467.0 million, a decrease of \$90.6 million, or 16%, from 2019. IEEE had total operating expenses for 2020 of \$393.5 million. This represents a decrease of \$115.1 million, or 23.0%, from 2019. Accordingly, IEEE's expenses decreased more than the decline in revenues, resulting in an increase in net assets of \$73.6 million from operations, as further discussed below:

- **Periodicals and Media:** revenues increased by \$0.2 million or 0.1%, while expenses reduced by \$19.8 million or 10%. Despite the impact of the pandemic, overall performance was driven by sustained customer demand for IEEE products and continued focus on improving publication efficiency and cost reduction.
- **Conferences:** revenues declined by \$83.4 million or 39%, principally driven by pandemic-related cancellation of planned large face-to-face conferences and events. To mitigate this impact, IEEE successfully organized virtual and hybrid conferences in 2020. Conference expenses declined by \$81.5 million or 49%, largely driven by the smaller number of events and reduction in conference travel.

- **Membership:** revenues declined by \$4.4 million or 7% due to lower membership renewal revenues, which was offset by expenses declining by \$9.1 million or 10%.
- **Standards Association:** revenues declined by \$2.7 million or 6% due to a reduction in Standards Working Groups revenues, which was offset by expenses declining by \$0.5 million or 1%.

Non-operating activities generated \$59.5 million in net gain, primarily due to \$69.7 million in net gain from investments (inclusive of interest and dividends) and \$0.5 million in income tax benefit related to IEEE GlobalSpec. These gains were offset by a \$10.7 million loss on the sale of IEEE GlobalSpec assets.

Overall, IEEE Net Assets increased \$133.1 million in 2020 to \$665.3 million, as compared to the 2019 year-end balance of \$532.2 million.

Grant Thornton LLP, the independent auditors for IEEE, met with the IEEE Audit Committee to discuss the scope and results of the financial statement audit, to review the adequacy of IEEE's internal accounting controls and to examine the quality of IEEE's financial reporting prior to issuing its opinion on the financial statements. IEEE received an unmodified opinion from Grant Thornton LLP in the Report of Independent Certified Public Accountants.

IEEE is tax-exempt under Section 501(c)(3) of the Internal Revenue Code. The IEEE Foundation is a separately incorporated, related organization of IEEE; accordingly, its audited financial statements are not included in the accompanying documents.

I submit these financial statements with confidence that IEEE continues to be a financially sound organization.



A handwritten signature in black ink, reading "Joseph V. Lillie". The signature is fluid and cursive.

Joseph V. Lillie
2020 IEEE Treasurer

REPORT OF INDEPENDENT CERTIFIED PUBLIC ACCOUNTANTS

To the Board of Directors of: **The Institute of Electrical and Electronics Engineers, Incorporated**

We have audited the accompanying consolidated financial statements of The Institute of Electrical and Electronics Engineers, Incorporated and subsidiaries (collectively, the "Institute"), which comprise the consolidated statements of financial position as of December 31, 2020 and 2019, and the related consolidated statements of activities and cash flows for the years then ended, and the related notes to the consolidated financial statements.

Management's responsibility for the financial statements

Management is responsible for the preparation and fair presentation of these consolidated financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's responsibility

Our responsibility is to express an opinion on these consolidated financial statements based on our audits. We conducted our audits in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the consolidated financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the consolidated financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the consolidated financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the Institute's preparation and fair presentation of the consolidated financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Institute's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of The Institute of Electrical and Electronics Engineers, Incorporated and subsidiaries as of December 31, 2020 and 2019, the changes in their net assets and their cash flows for the years then ended in accordance with accounting principles generally accepted in the United States of America.



Iselin, New Jersey
June 2, 2021

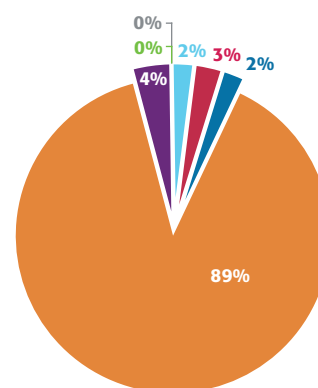
CONSOLIDATED STATEMENTS OF FINANCIAL POSITION

As of December 31, 2020 and 2019

ASSETS	2020	2019
CURRENT ASSETS		
Cash and cash equivalents	\$ 20,126,300	\$ 22,122,700
Accounts receivable, less allowance for doubtful accounts of \$1,708,300 in 2020 and \$1,648,200 in 2019	27,451,200	41,699,100
Prepaid expenses and other assets	17,550,500	19,710,300
Investments, at fair value	813,132,500	649,984,400
Investments - other	3,435,900	2,537,000
Total current assets	881,696,400	736,053,500
NONCURRENT ASSETS		
Land, buildings, and equipment, net	35,594,300	39,415,300
Goodwill	-	2,289,700
Intangible assets	-	7,228,300
Deferred tax assets	636,700	145,500
Total assets	\$ 917,927,400	\$ 785,132,300
LIABILITIES AND NET ASSETS		
CURRENT LIABILITIES		
Accounts payable and accrued expenses	\$ 55,516,100	\$ 56,138,900
Capital lease obligations	114,300	156,700
Accrued pension and other employee benefits	537,000	392,200
Amounts held on behalf of IEEE Foundation, Incorporated	54,112,600	48,367,900
Deferred revenue	117,816,500	125,505,700
Total current liabilities	228,096,500	230,561,400
NONCURRENT LIABILITIES		
Capital lease obligations, net of current portion	28,000	436,800
Accrued pension and other employee benefits, net of current portion	24,509,400	21,926,200
Total liabilities	252,633,900	252,924,400
Commitments and contingencies		
NET ASSETS		
Without donor restrictions		
Undesignated	644,640,500	509,919,700
Board-designated fund	18,604,200	20,400,000
Total without donor restrictions	663,244,700	530,319,700
With donor restrictions	2,048,800	1,888,200
Total net assets	665,293,500	532,207,900
Total liabilities and net assets	\$ 917,927,400	\$ 785,132,300

2020 ASSETS

IEEE net assets increased \$133.1 million, or 25%, to \$665.3 million, as of December 31, 2020 from \$532.2 million as of December 31, 2019. The increase in net assets is primarily due to income generated from operating activities. The surpluses from operating activities were then invested primarily into marketable securities and fixed income investments. Non-operating activities also increased net assets primarily through income earned on investment balances.



- CASH AND CASH EQUIVALENTS
- ACCOUNTS RECEIVABLE, LESS ALLOWANCE FOR DOUBTFUL
- PREPAID EXPENSES AND OTHER ASSETS
- INVESTMENTS (CURRENT AND LONG-TERM)
- LAND, BUILDINGS AND EQUIPMENT, NET OF ACCUMULATED DEPRECIATION
- GOODWILL AND INTANGIBLES, NET
- DEFERRED TAX ASSETS

The accompanying notes are an integral part of these consolidated financial statements.

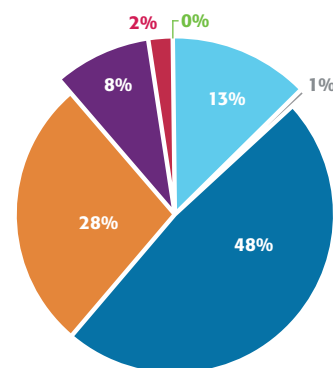
CONSOLIDATED STATEMENT OF ACTIVITIES

For the year ended December 31, 2020

	Without Donor Restrictions	With Donor Restrictions	Total
REVENUES			
Memberships	\$ 59,523,600	\$ -	\$ 59,523,600
Periodicals and media	234,579,000	-	234,579,000
Conferences	129,029,800	-	129,029,800
Standards	41,491,500	-	41,491,500
Public imperatives	2,166,600	235,500	2,402,100
Other income	9,300	-	9,300
Net assets released from restrictions	143,400	(143,400)	-
Total revenues	466,943,200	92,100	467,035,300
EXPENSES			
Program services:			
Memberships	80,553,100	-	80,553,100
Periodicals and media	171,836,100	-	171,836,100
Conferences	84,965,400	-	84,965,400
Standards	37,730,700	-	37,730,700
Public imperatives	11,241,500	-	11,241,500
Total program services	386,326,800	-	386,326,800
Supporting services:			
General and administrative	7,144,000	-	7,144,000
Total expenses	393,470,800	-	393,470,800
Changes in net assets before non-operating activities	73,472,400	92,100	73,564,500
NON-OPERATING ACTIVITIES			
Investment gain, net	69,633,800	68,500	69,702,300
Pension and related benefits activity other than net periodic benefit cost	10,400	-	10,400
Loss on sale and dissolution of IEEE GlobalSpec, Inc.	(10,691,000)	-	(10,691,000)
Changes in net assets before income tax	132,425,600	160,600	132,586,200
Benefit for income taxes	499,400	-	499,400
Changes in net assets	132,925,000	160,600	133,085,600
Net assets, beginning of year	530,319,700	1,888,200	532,207,900
Net assets, end of year	\$ 663,244,700	\$ 2,048,800	\$ 665,293,500

2020 REVENUES

The IEEE Statement of Activities reflects total revenues for 2020 of \$467.0 million, a decrease of \$90.6 million, or 16%, from 2019. Principally driven due to pandemic-related cancellation of planned large face-to-face conferences and events.



- MEMBERSHIP
- PUBLIC IMPERATIVES
- PERIODICALS & MEDIA
- CONFERENCES
- STANDARDS
- IEEE GLOBAL SPEC, INC.
- OTHER INCOME

The accompanying notes are an integral part of this consolidated financial statement.

CONSOLIDATED STATEMENT OF ACTIVITIES

For the year ended December 31, 2019

	Without Donor Restrictions	With Donor Restrictions	Total
REVENUES			
Memberships	\$ 63,892,500	\$ -	\$ 63,892,500
Periodicals and media	234,358,700	-	234,358,700
Conferences	212,398,900	-	212,398,900
Standards	44,181,600	-	44,181,600
Public imperatives	2,576,000	139,700	2,715,700
Other income	109,900	-	109,900
Net assets released from restrictions	126,100	(126,100)	-
Total revenues	557,643,700	13,600	557,657,300
EXPENSES			
Program services:			
Memberships	89,690,800	-	89,690,800
Periodicals and media	191,647,700	-	191,647,700
Conferences	166,487,300	-	166,487,300
Standards	38,263,200	-	38,263,200
Public imperatives	12,320,100	-	12,320,100
Total program services	498,409,100	-	498,409,100
Supporting services:			
General and administrative	10,190,700	-	10,190,700
Total expenses	508,599,800	-	508,599,800
Changes in net assets before non-operating activities	49,043,900	13,600	49,057,500
NON-OPERATING ACTIVITIES			
Investment gain, net	72,928,300	77,800	73,006,100
Pension and related benefits activity other than net periodic benefit cost	(1,554,900)	-	(1,554,900)
Gain on sale of land and building	1,827,700	-	1,827,700
Changes in net assets before income tax	122,245,000	91,400	122,336,400
Benefit for income taxes	744,700	-	744,700
Changes in net assets	122,989,700	91,400	123,081,100
Net assets, beginning of year	407,330,000	1,796,800	409,126,800
Net assets, end of year	\$ 530,319,700	\$ 1,888,200	\$ 532,207,900

The accompanying notes are an integral part of this consolidated financial statement.

CONSOLIDATED STATEMENTS OF CASH FLOWS

For the years ended December 31, 2020 and 2019

	2020	2019
CASH FLOWS FROM OPERATING ACTIVITIES		
Changes in net assets	\$ 133,085,600	\$ 123,081,100
Adjustments to reconcile changes in net assets to net cash provided by operating activities:		
Depreciation and amortization	14,003,400	15,896,200
Unrealized gains on investments	(48,081,200)	(51,211,000)
Gains on sale of investments	(11,752,800)	(9,221,500)
Gain on sale of land and building	-	(1,827,700)
Loss on sale and dissolution of IEEE GlobalSpec, Inc.	10,691,000	-
Bad debt expense	909,300	385,200
<i>Changes in assets and liabilities:</i>		
Accounts receivable	8,384,900	(6,167,100)
Prepaid expenses and other assets	1,771,500	(1,017,600)
Accounts payable and accrued expenses	(1,600,900)	1,883,600
Accrued pension and other employee benefits	2,728,000	(6,921,100)
Amounts held on behalf of IEEE Foundation, Incorporated	5,744,700	6,179,600
Deferred revenue	(5,877,900)	5,246,900
Income tax payable and deferred tax liability	(491,200)	(857,000)
Net cash provided by operating activities	109,514,400	75,449,600
CASH FLOWS FROM INVESTING ACTIVITIES		
Proceeds from sales of investments	302,243,800	352,954,300
Proceeds from sale of IEEE GlobalSpec, Inc.	2,000,000	-
Proceeds from sales of building and equipment	-	1,971,700
Purchases of investments	(406,456,800)	(417,619,100)
Purchase of land, buildings and equipment	(11,219,700)	(6,901,000)
Net cash used in investing activities	(113,432,700)	(69,594,100)
CASH FLOWS FROM FINANCING ACTIVITIES		
Change in cash overdraft	1,989,700	(1,693,700)
Payment of capital lease obligations	(67,800)	(145,700)
Net cash provided by (used in) financing activities	1,921,900	(1,839,400)
Net (decrease) increase in cash and cash equivalents	(1,996,400)	4,016,100
Cash and cash equivalents, beginning of year	22,122,700	18,106,600
Cash and cash equivalents, end of year	\$ 20,126,300	\$ 22,122,700
SUPPLEMENTAL DATA		
Interest paid on letter of credit	\$ -	\$ 62,700
Purchases of fixed assets included in accounts payable and accrued expenses	\$ 184,700	\$ 385,800
Aquisition of equipment through capital lease obligations	\$ -	\$ 539,900

The accompanying notes are an integral part of these consolidated financial statements.

NOTES TO CONSOLIDATED FINANCIAL STATEMENTS

December 31, 2020 and 2019

NOTE 1. THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INCORPORATED

The objectives of The Institute of Electrical and Electronics Engineers, Incorporated (the "Institute," or "IEEE") are (a) scientific and educational, directed toward the advancement of the theory and practice of electrical engineering, electronics engineering, computer engineering, computer sciences and the allied branches of engineering and related arts and sciences and (b) professional, directed toward the benefit of the engineering community and the general public.

In 2016, the Institute, through its for-profit subsidiary, IEEE, Inc., expanded its activities in furtherance of these objectives with the acquisition of GlobalSpec, Inc., a leading source of news, data and analytics for the global engineering and technical community including the widely known brand name Engineering360. The new for-profit subsidiary of IEEE, Inc. was renamed IEEE GlobalSpec, Inc. ("IEEE GlobalSpec") (wholly owned by IEEE, Inc.) and significantly complements IEEE's already broad offerings for engineers as well as its emerging position in research analytics, further fueling the organization's value to the industry through its business-oriented, content rich marketing platforms. Refer to Note 2 for information relating to the sale and dissolution of IEEE GlobalSpec during fiscal year 2020.

Implementation of the Institute's objectives is performed by members and volunteer communities organized as regions, sections, chapters, societies and councils (collectively, "units"), none of which are separately incorporated, and their financial results are incorporated in the Institute's accompanying consolidated financial statements. These units were formed to serve the technical interests of members and to coordinate local activities of the sections and the broader activities of the Institute. The societies and councils promote the technical interests of their members through symposia, conferences, various publications and the development of standards.

The consolidated financial statements include the accounts of IEEE, Inc., Global IEEE Institute for Engineers, Inc., IEEE Global LLC, IEEE International LLC, IEEE Europe GmbH, IEEE Latin America SA, IEEE Broadcast Technology Convention LLC, IEEE Worldwide Limited, IEEE Asia-Pacific Limited, IEEE GlobalSpec, Inc.¹ and IEEE Technology Center GmbH.

¹Results of IEEE GlobalSpec, Inc. through July 31, 2020 have been included in the accompanying consolidated financial statements. Refer to Note 2 for information relating to the sale and dissolution of IEEE GlobalSpec, Inc.

NOTE 2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Basis of Presentation

The Institute's consolidated financial statements are presented in conformity with U.S. generally accepted accounting principles ("U.S. GAAP") and have been prepared on the accrual basis of accounting. All intercompany accounts and transactions have been eliminated in the accompanying consolidated financial statements.

Net Asset Classifications

The Institute's net assets, revenues, expenses, gains and losses are classified based on the existence or absence of donor-imposed restrictions. Accordingly, the net assets of the Institute and changes therein are classified and reported as follows:

Without donor restrictions - net assets that are not subject to donor-imposed stipulations. Net assets without donor restrictions may be designated for specific purposes by actions of the Board of Directors. Net assets without donor restrictions can be utilized to carry out any of the purposes of the Institute.

Included within net assets without donor restrictions are balances of \$18,604,200 and \$20,400,000 as of December 31, 2020 and 2019, respectively, relating to funds that were designated by the Board of Directors for the purpose of upgrading the Institute's financial systems and processes.

With donor restrictions - represent amounts restricted by donors for specific activities of the Institute or to be used at some future date. The Institute records contributions as net assets with donor restrictions if they are received with donor stipulations that limit their use either through purpose or time restrictions. When a donor restriction expires, that is, when a time restriction ends or a purpose restriction is fulfilled, net assets with donor restrictions are reclassified to net assets without donor restrictions and reported on the consolidated statement of activities as net assets released from restrictions. However, when restrictions on donor-restricted contributions and investment returns are met in the same accounting period, such amounts are reported as part of net assets without donor restrictions.

Another portion of net assets with donor restrictions include funds wherein donors have stipulated that the principal contributed be invested and maintained in perpetuity. Income earned from these investments is available for expenditure according to restrictions imposed by donors and consideration of the appropriation for expenditure criteria by the Institute pursuant to the New York Prudent Management of Institutional Funds Act ("NYPMIFA").

Cash and Cash Equivalents

Cash and cash equivalents are defined as cash balances held in bank accounts and highly liquid short-term investments held by the Institute for operating use with original maturities of three months or less from the date of purchase.

Investments

Investments in publicly traded debt and equity securities are recorded at fair value determined on the basis of quoted market prices as of the reporting date. Investments in alternative investments (e.g. commingled funds) that are not readily marketable are reported at fair value as determined by the respective investment manager as of the reporting date. The Institute follows guidance on measuring the fair value of alternative investments, which offers investors a practical expedient for measuring the fair value of investments in certain entities that calculate net asset value ("NAV"). Under this practical expedient, entities are permitted to use NAV without adjustment for certain investments which: (a) do not have a readily determinable fair value and (b) prepare their financial statements consistent with the measurement principles of an investment company or have the attributes of an investment company. Additionally, the Institute follows guidance that removes the requirement to categorize, within the fair value hierarchy, all investments for which the fair value is measured using NAV.

Such valuations involve assumptions and methods that are reviewed by the Institute and have been concluded to be reasonable and appropriate. Because such investments are not readily marketable, their estimated fair value is subject to uncertainty and therefore may differ from the value that would have been used had a ready market for such investments existed. Such difference could be material. However, the risk to the Institute is limited to the amount of the Institute's investment in each of the respective funds with respect to its ownership interests.

Purchases and sales of securities are reflected on a trade-date basis. Gains and losses on sales of securities are determined on an average cost basis and are recorded on the consolidated statement of activities in the period in which the securities are sold. Dividends and interest are recognized as earned.

Investments - Other

Investments - other consist of certificates of deposit held to maturity with original maturities greater than three months that are not debt securities and are carried at amortized cost.

Fair Value Measurements

The Institute follows guidance that defines fair value, establishes a framework for measuring fair value and expands disclosures about fair value measurements. This guidance provides a consistent definition of fair value, which focuses on an exit price between market participants in an orderly transaction. The guidance also prioritizes the use of observable inputs and minimizes the use of unobservable inputs by requiring that observable inputs be used when available to determine the fair value of an instrument as of the reporting date.

Observable inputs are inputs that market participants would use in pricing the asset or liability based on market data obtained from independent sources. Unobservable inputs reflect assumptions that market participants would use in pricing the asset or liability based on the best information available in the circumstances. The hierarchy is broken down into three levels based on the transparency of inputs as follows:

Level 1 - Quoted prices are available in active markets for identical assets or liabilities as of the measurement date. A quoted price for an identical asset or liability in an active market provides the most reliable fair value measurement because it is directly observable to the market.

Level 2 - Pricing inputs are other than quoted prices in active markets, which are either directly or indirectly observable as of the measurement date. The nature of these securities include investments for which quoted prices are available but traded less frequently and investments that are fair valued using other securities, the parameters of which can be directly observed.

Level 3 - Securities that have little to no pricing observability as of the measurement date. These securities are measured using management's best estimate of fair value, where the inputs into the determination of fair value are not observable and require significant management judgment or estimation.

Inputs are used in applying the various valuation techniques and broadly refer to the assumptions that market participants use to make valuation decisions, including assumptions about risk. Inputs may include price information, volatility statistics, specific and broad credit data, liquidity statistics and other factors. A financial instrument's level within the fair value hierarchy is based on the lowest level of any input that is significant to the fair value measurement. However, the determination of what constitutes "observable" requires significant judgment by an entity. The Institute considers observable data to be that market data that is readily available, regularly distributed or updated, reliable and verifiable, not proprietary and provided by independent sources that are actively involved in the relevant market. The categorization of a financial instrument within the hierarchy is based upon the pricing transparency of the instrument and does not necessarily correspond to the Institute's perceived risk of that instrument.

Revenue

In accordance with Financial Accounting Standards Board ("FASB") Accounting Standards Codification ("ASC") *Topic 606, Revenue from Contracts with Customers* ("ASC 606"), the Institute recognizes revenue when control of the promised goods or services are transferred to the Institute's customers in an amount that reflects the consideration the Institute expects to be entitled to in exchange for those goods or services.

The standard outlines a five-step model whereby revenue is recognized as performance obligations within a contract are satisfied.

Public Imperatives

Public imperative revenues primarily consist of grants and contributions, including unconditional promises to give. Grants and unconditional promises to give are reported as revenues in the period received. Conditional contributions are recorded as revenue when the conditions on which they depend are substantially met.

Public imperatives are social good activities that are directed at the public and not an individual or small group of individuals. They are generally related to the promotion of the public's understanding and appreciation of the Institute's fields of interest and/or positioning the Institute's technical expertise in ways to benefit humanity. Typically, these activities are not expected to create a financial surplus but rather are funded by the surplus of other activities.

- * Public imperative revenues primarily consist of IEEE-USA Assessments, History Center and Foundation-related activities.
- * Public imperative expenses consist of History Center, grants, certain IEEE-USA activities, and educational activities, initiatives, honors ceremonies, presentations and some Society activities.

Accounts Receivable and Allowance for Doubtful Accounts

Accounts receivable are recorded at the invoiced amount and do not bear interest. The Institute reviews a customer's credit history before extending credit. The Institute maintains allowances for doubtful accounts against certain billed receivables based upon the latest information available regarding whether the receivables are ultimately collectible. Assessing the collectability of customer receivables requires management's judgment. The Institute determines its allowance for doubtful accounts by specifically analyzing individual accounts receivable, historical bad debts, customer

creditworthiness, current economic conditions and accounts receivable aging trends. Valuation reserves are periodically re-evaluated and adjusted as more information about the ultimate collectability of accounts receivable becomes available. Upon determination that a receivable is uncollectible, the respective receivable balance and any associated reserve are written off. Any payments subsequently received on such receivables are recorded as income in the period received.

Land, Buildings and Equipment

Land, buildings and equipment are stated at cost, including interest expense capitalized during the period of construction, or period of development, until the time that it is ready for its intended use. Additions and improvements costing more than \$5,000 and with useful lives greater than three years are capitalized. Maintenance and repairs are expensed as incurred.

Assets acquired under capital lease agreements are depreciated over the term of the respective lease agreement to which they pertain. Leasehold improvements are amortized over their useful lives or lease period, whichever is shorter.

Included in land, buildings and equipment are certain implementation costs relating to a financial system upgrade. During fiscal year 2020, the Institute began the process of updating its financial system and moving to an integrated, cloud-based platform for financial recording and reporting (including contracts, banking and expense reporting). This implementation will be a phased approach and is anticipated to be completed in 2021. The Institute capitalized implementation costs relating to such financial system upgrade in accordance with FASB Accounting Standards Update ("ASU") 2018-15, *Customer's Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement That Is a Service Contract*, and such costs are reflected in the "Information systems upgrade in process" line of Note 5.

Depreciation and amortization are provided on a straight-line basis over the following estimated useful lives:

	Years
Buildings	20 - 40
Building improvements	10 - 15
Furniture, equipment and vehicles	5 - 10
Software and information systems	3 - 5
Computers	3

Goodwill

Goodwill represents the excess of the purchase price over the fair value of net tangible and intangible assets acquired in a business combination and is not amortized. The Institute evaluates goodwill for impairment at least annually and more frequently if certain indicators are encountered that may indicate that the carrying value of goodwill may not be fully recoverable. Goodwill is tested at the reporting unit level with the fair value of the reporting unit being compared to its carrying amount, including goodwill.

The Institute performs its annual impairment test as of March 31st each year. The Institute first assesses qualitative factors to determine whether it is more likely than not that the fair value of a reporting unit, related to such goodwill, is less than the carrying amount. If the fair value exceeds the carrying value, goodwill is not impaired and no further testing is performed. However, if the carrying amount exceeds the fair value, the Institute should recognize an impairment charge for the amount by which the carrying amount exceeds the fair value, not to exceed the total amount of goodwill allocated to that reporting unit.

As part of the sale of IEEE GlobalSpec, Inc., the Institute wrote off its remaining goodwill balance relating to IEEE GlobalSpec, Inc. Refer to the ***Sale and Dissolution of IEEE GlobalSpec, Inc.*** section below for details relating to such sale and dissolution.

Impairment of Long-Lived Assets and Intangible Assets

Long-lived assets, including land, buildings and equipment, and intangible assets, are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount of the asset may not be recoverable. If the carrying amount of the reporting unit exceeds its fair value and the carrying amount is not recoverable, an impairment charge is recognized. An impairment loss is measured as the amount by which the long-lived asset (or asset group) exceeds its fair value. Fair value is determined through various valuation techniques including discounted or undiscounted cash flow models, quoted market values and third-party independent appraisals, as considered necessary.

Intangible assets with definite lives are amortized over their estimated useful lives. The Institute amortizes intangible assets on a straight-line basis over periods ranging from three to 20 years and records amortization expense as part of supporting services in its consolidated statement of activities. The weighted average useful life of intangible assets is estimated at six years.

The following table presents identified intangible assets as of December 31, 2019:

2019				
	Amortization Period	Gross Amount	Accumulated Amortization	Net Amount
INTANGIBLE ASSETS				
Registered users	5 years	\$ 12,600,000	\$ 9,240,000	\$ 3,360,000
Internally developed internal-use technology	4 years	11,700,000	10,725,000	975,000
Other (a)	3 - 20 years	3,900,000	1,006,700	2,893,300
Total		\$ 28,200,000	\$ 20,971,700	\$ 7,228,300

(a) Represents the value associated with trade name, long-form content and customer relationships.

As of December 31, 2020, the Institute did not hold any of the above-referenced identified intangible assets (which were related to the Institute's acquisition of IEEE GlobalSpec, Inc.) as a result of the sale of IEEE GlobalSpec, Inc. during fiscal year 2020. Therefore, the Institute wrote off its remaining intangible assets relating to IEEE GlobalSpec, Inc. in connection with such sale. Refer to the ***Sale and Dissolution of IEEE GlobalSpec, Inc.*** section for details relating to such sale.

The Institute recorded amortization of identified intangible assets of \$2,573,200 and \$5,687,200 as of December 31, 2020 and 2019, respectively.

Sale and Dissolution of IEEE GlobalSpec, Inc.

On July 31, 2020, IEEE, Inc. sold the assets and certain liabilities of IEEE GlobalSpec, Inc. for a total sales price of \$2,000,000. Subsequently, IEEE, Inc. dissolved IEEE GlobalSpec, Inc. on December 21, 2020. The resulting loss on the sale and dissolution of IEEE GlobalSpec, totaling approximately \$10,691,000, is included in the corresponding line within the accompanying consolidated statement of activities.

Accounts Payable and Accrued Expenses

Cash overdrafts are included in accounts payable and accrued expenses. At December 31, 2020 and 2019, cash overdrafts amounted to \$1,989,700 and \$0, respectively.

Concentration of Market and Credit Risks

Cash, cash equivalents and investments are exposed to interest rate, market and credit risks. The Institute maintains its cash and cash equivalents in various bank deposit accounts that may exceed federally insured limits at times. To minimize risk, the Institute's cash accounts are placed with high-credit quality financial institutions, and the Institute's investment portfolio is diversified with several investment managers in a variety of asset classes. The Institute regularly evaluates its depository arrangements and investments, including performance thereof.

Operating Measure

The Institute classifies its consolidated statement of activities into operating and non-operating activities. Operating activities include all income and expenses related to carrying out the Institute's mission. Non-operating activities include interest and dividends, realized and unrealized gains (losses) on investments, pension and other employee benefit related activity other than net periodic benefit cost, and other items considered to be unusual or of a non-recurring nature.

Income Taxes and Tax Status

a. Uncertain Tax Positions

The Institute is qualified under Section 501(c)(3) of the Internal Revenue Code ("Code") as an organization exempt from federal income tax and applicable state income tax and is classified as a publicly supported charitable organization under Section 509(a)(2) of the Code. Nevertheless, the Institute is subject to tax on income unrelated to its exempt purpose, unless that income is otherwise excluded by the Code.

The Institute follows guidance that clarifies the accounting for uncertainty in tax positions taken or expected to be taken in a tax return, including issues relating to financial statement recognition and measurement. This section provides that the tax effects from an uncertain tax position can be recognized in the financial statements only if the position is "more-likely-than-not" to be sustained if the position were to be challenged by a taxing authority. The assessment of the tax position is based solely on the technical merits of the position, without regard to the likelihood that the tax position may be challenged. As of December 31, 2020 and 2019, management has determined that there are no significant uncertain tax positions that would require recognition or disclosure in the accompanying consolidated financial statements.

b. The Institute's Income Tax Provision

The Institute has historically conducted unrelated business income activities and filed a federal Form 990-T and associated state equivalent

unrelated business income tax returns. The Institute's financial statements reflect the changes effectuated by the 2017's Tax Cuts and Jobs Act ("TCJA") that require the Institute to track its federal Net Operating Losses ("NOLs") into separate buckets. Pre-TCJA NOLs generated prior to January 1, 2018 can be carried forward up to 20 years, while post-TCJA NOLs generated after December 31, 2017 can be carried forward indefinitely.

For the year ending December 31, 2020, the Institute generated an additional gross federal NOLs of \$395,100, with a cumulative total gross federal NOLs of \$3,034,800, of which \$2,353,300 NOLs is pre-TCJA and \$681,500 NOLs is post-TCJA, all are carryforward to future periods. The Institute also has a cumulative total gross state NOLs of \$279,000 with carry forward periods which vary from 12 years to indefinitely.

Deferred income taxes are recognized for the temporary differences between the tax bases of assets and liabilities and their financial reporting amounts at each year-end on the basis of enacted tax laws and statutory tax rates applicable to the periods in which the differences are expected to affect taxable income. Pursuant to ASC 740-10-30-2(b) that valuation allowances are recognized if, based on the weight of available evidence, it is more likely than not that all or some portion of any deferred tax asset will not be realized. The benefit or provision for income tax represents the income tax benefit or payable for the year and the change in deferred tax assets and liabilities during the period.

As of December 31, 2020 and 2019, the Institute's lone deferred tax asset is its NOLs; the Institute recognized a deferred tax asset of \$636,700 and \$145,500, respectively. The Institute's deferred tax assets are netted with deferred tax liabilities on the accompanying 2020 and 2019 consolidated statements of financial position.

c. Income Tax Provisions of For-Profit Subsidiaries

IEEE, Inc. and IEEE GlobalSpec, Inc., subsidiaries of the Institute, are considered for-profit entities under the Code. For these subsidiaries, income tax expense, deferred tax assets and liabilities, and liabilities for unrecognized tax benefits reflect management's best assessment of estimated current and future taxes paid. Significant judgements and estimates are required in determining the consolidated income tax expense.

In July 2020, IEEE GlobalSpec, Inc.'s assets were sold to and certain liabilities were assumed by a third-party company and resulted in a taxable asset sale loss of \$1,289,100. The legal entity was liquidated in December 2020. IEEE GlobalSpec's gross federal NOLs of \$9,901,300 survived and carried over to its direct parent, IEEE, Inc.; however, the net deferred tax liabilities of \$2,407,200 and standalone state gross NOLs of \$3,949,200 were lost following liquidation.

As of December 31, 2020, IEEE, Inc. had a total gross federal NOLs of \$13,552,300 of which \$7,504,900 can be carried forward up to 20 years and \$6,047,420 can be carried forward indefinitely. Its deferred tax assets

totaled \$3,949,600 and since there was insufficient positive and objective evidence to support a position that IEEE, Inc. would ever be able to utilize the benefits of any of these deferred tax assets in the near future, the Institute's management recorded a valuation allowance of \$3,949,600 against the Institute's consolidated net deferred tax assets as of December 31, 2020.

d. Consolidated Income Tax Provision

For the years ended December 31, 2020 and 2019, the benefit for income taxes consisted of the following:

	2020	2019
Current:		
Federal	\$ -	\$ 5,700
State	(8,100)	106,600
	(8,100)	112,100
Deferred:		
Federal	(467,300)	(591,100)
State	(24,000)	(265,900)
	(491,300)	(857,000)
Benefit for income taxes	\$ (499,400)	\$ (744,700)

For the year ended December 31, 2020, the Institute's consolidated benefit for income tax is \$499,400, comprised of \$503,400 in tax benefit from the Institute's unrelated business income activities and (\$4,000) in provision expense from IEEE, Inc. and IEEE GlobalSpec, Inc. for-profit business income activities. For the year ended December 31, 2019, the consolidated benefit for income tax was \$744,700 comprised of \$1,215,500 in tax benefit from IEEE, Inc. and IEEE GlobalSpec, Inc. for-profit business income activities and \$470,700 in provision expense from the Institute's unrelated business income activities.

Use of Estimates

The preparation of consolidated financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the consolidated financial statements and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates.

Pronouncements

In February 2016, the FASB issued ASU 2016-02, *Leases (Topic 842)*, which requires organizations that lease assets (lessees) to recognize the assets and related liabilities for the rights and obligations created by the leases on the statements of financial position for leases with terms exceeding 12 months. ASU 2016-02 defines a lease as a contract or part

of a contract that conveys the right to control the use of identified assets for a period of time in exchange for consideration. The lessee in a lease will be required to initially measure the right-of-use asset and the lease liability at the present value of the remaining lease payments, as well as capitalize initial direct costs as part of the right-of-use asset. In October 2019, the FASB approved a proposal to defer the effective date of ASU 2016-02 by one year. Furthermore, in June 2020, the FASB issued ASU 2020-05, which deferred the effective date of ASU 2016-02 for not-for-profit entities by an additional year. Therefore, the guidance is effective for the Institute's fiscal year 2022. Early adoption is permitted. The Institute is in the process of evaluating the impact this standard will have on its consolidated financial statements.

In August 2018, the FASB issued ASU 2018-15, *Customer's Accounting for Implementation Costs Incurred in a Cloud Computing Arrangement That Is a Service Contract*, which aligns the requirements for capitalizing implementation costs incurred in a hosting arrangement that is a service contract with the requirements for capitalizing implementation costs incurred to develop or obtain internal-use software (and hosting arrangement that include an internal-use software license). Accordingly, ASU 2018-15 requires an entity in a hosting arrangement that is a service contract to follow the guidance in Subtopic 350-40 to determine which implementation costs to capitalize as an asset related to the service contract and which costs to expense. Early adoption is permitted. The Institute elected to early adopt ASU 2018-15 during fiscal year 2020.

Subsequent Events

The Institute evaluated its December 31, 2020 consolidated financial statements for subsequent events through June 2, 2021, the date the consolidated financial statements were available to be issued. The Institute is not aware of any other material subsequent events which would require recognition or disclosure in the accompanying consolidated financial statements.

NOTE 3. REVENUE RECOGNITION

Membership Dues

The Institute offers membership for terms of one year. The Institute satisfies its performance obligation and recognizes revenue evenly over the membership term as its members simultaneously receive and consume the benefits over that timeframe. Generally, membership doesn't commence until after the Institute receives payment.

Payments received for membership dues in advance of the Institute satisfying its performance obligation are recorded within deferred revenue in the accompanying consolidated statements of financial position.

The changes in deferred revenue relating to membership dues were caused by normal timing differences between the satisfaction of performance obligations and customer payments.

For the year ended December 31, 2020, the Institute recognized membership dues revenue of approximately \$34,945,100 from amounts that were included in deferred revenue at the beginning of the year.

At December 31, 2020, deferred revenue relating to membership dues totaled \$32,858,300 and the related performance obligations are expected to be satisfied within one year.

Periodicals and Media

Periodicals revenues primarily include subscriptions and online products and content. Such revenues are recognized upon delivery of the online product or content or over the related subscription period.

Media revenue primarily includes advertising space sold in newsletters and periodicals and is recognized in the period the newsletter or periodical is issued and distributed.

Disaggregated Periodicals and Media revenue, follows:

	2020	2019
Periodicals	\$ 223,918,300	\$ 212,534,300
Media	10,660,700	21,824,400
	\$ 234,579,000	\$ 234,358,700

Payments received for periodicals and media agreements in advance of the Institute satisfying its performance obligations are recorded within deferred revenue in the accompanying consolidated statements of financial position and recognized as revenue in future periods as performance obligations are satisfied. The changes in deferred revenue were caused by normal timing differences between the satisfaction of performance obligations and customer payments.

For the year ended December 31, 2020, the Institute recognized periodicals and media revenue of approximately \$78,574,900 from amounts that were included in deferred revenue at the beginning of the year.

At December 31, 2020, deferred revenue relating to periodicals and media totaled \$80,490,100, and the related performance obligations are primarily expected to be satisfied within one year.

For the years ended December 31, 2020 and 2019, approximately 77% and 23% of periodicals and media revenue was recognized "over time" and at "point-in-time", respectively.

Conferences

Conference revenues primarily include registration and sponsorships, and also includes the conference proceedings and published articles related to respective conferences. Revenues from conference registration and sponsorships are recognized as the conferences take place. Revenues from conference proceedings and articles are recognized in the period in which they are sold.

For the year ended December 31, 2020, the Institute recognized conference revenue of \$11,096,300 from amounts that were included in deferred revenue at the beginning of the year.

At December 31, 2020, deferred revenue relating to conference revenues totaled approximately \$3,635,000 and the related performance obligations are expected to be satisfied within one year.

Standards

Standards revenues primarily include subscriptions, publications and online products and content relating to technology standards. Such revenues are recognized upon delivery of the online products or content or over the related subscription period.

Payments received for standards agreements in advance of the Institute satisfying its performance obligation are recorded within deferred revenue in the accompanying consolidated statements of financial position and recognized as revenue in future periods as performance obligations are satisfied. The changes in deferred revenue were caused by normal timing differences between the satisfaction of performance obligations and customer payments.

For the year ended December 31, 2020, the Institute recognized standards revenue of approximately \$889,500 from amounts that were included in deferred revenue at the beginning of the year.

At December 31, 2020, deferred revenue relating to standards revenues totaled \$833,100, and the related performance obligations are primarily expected to be satisfied within one year.

For the years ended December 31, 2020 and 2019, approximately 59% and 41% of standards revenue was recognized "over time" and at "point-in-time", respectively.

Accounts Receivable

Accounts receivables relating to the above revenues consist of the following:

	2020	2019
Periodicals and standards	\$ 17,876,500	\$ 24,155,800
Media	965,900	5,711,300
Conferences	8,968,300	11,140,300
Other	1,348,800	2,339,900
Total accounts receivable	29,159,500	43,347,300
Less: allowance for doubtful accounts	1,708,300	1,648,200
Accounts receivable, net of allowance for doubtful accounts	\$ 27,451,200	\$ 41,699,100

NOTE 4. INVESTMENTS

As of December 31, 2020, the Institute's investments, at fair value, by level within the fair value hierarchy, consist of the following:

	2020		
	Level 1	Net Asset Value	Total
<i>Common stock:</i>			
Consumer	\$ 27,377,900	\$ -	\$ 27,377,900
Technology	79,697,700	-	79,697,700
Financial services	42,772,400	-	42,772,400
Healthcare	32,947,600	-	32,947,600
Industrials	21,051,300	-	21,051,300
Energy	7,615,000	-	7,615,000
Other	13,216,500	-	13,216,500
Total common stocks	224,678,400	-	224,678,400
<i>Mutual funds:</i>			
Growth funds	56,471,400	-	56,471,400
Fixed income funds	157,819,600	-	157,819,600
Money market funds	159,319,000	-	159,319,000
Other funds	51,224,400	-	51,224,400
Total mutual funds	424,834,400	-	424,834,400
U.S. Government securities	62,703,000	-	62,703,000
Commingled funds	-	89,190,400	89,190,400
	\$ 712,215,800	\$ 89,190,400	\$ 801,406,200
Cash held for investment			11,819,200
Add: receivables for securities sold and accrued interest			625,600
Less: liabilities for securities purchased and accrued fees			(718,500)
Total investments, at fair value		\$	813,132,500

As of December 31, 2019, the Institute's investments, at fair value, by level within the fair value hierarchy, consist of the following:

	2019		
	Level 1	Net Asset Value	Total
<i>Common stock:</i>			
Consumer	\$ 25,087,700	\$ -	\$ 25,087,700
Technology	53,859,600	-	53,859,600
Financial services	38,612,800	-	38,612,800
Healthcare	33,331,800	-	33,331,800
Industrials	18,053,400	-	18,053,400
Energy	11,937,500	-	11,937,500
Other	10,238,400	-	10,238,400
Total common stocks	191,121,200	-	191,121,200
<i>Mutual funds:</i>			
Growth funds	45,012,200	-	45,012,200
Fixed income funds	144,506,600	-	144,506,600
Money market funds	85,672,100	-	85,672,100
Other funds	48,384,200	-	48,384,200
Total mutual funds	323,575,100	-	323,575,100
U.S. Government securities	45,449,000	-	45,449,000
Commingled funds	-	78,533,300	78,533,300
	\$ 560,145,300	\$ 78,533,300	\$ 638,678,600
Cash held for investment			11,777,300
Add: receivables for securities sold and accrued interest			339,200
Less: liabilities for securities purchased and accrued fees			(810,700)
Total investments, at fair value		\$	649,984,400

The Institute's policy is to recognize transfers in and transfers out of levels at the end of the reporting period.

The categorization of the investments within the fair value hierarchy presented above is based solely on the pricing transparency of the respective instrument and does not necessarily correspond to the Institute's perceived risk associated with the respective investment security.

The Institute uses, as a practical expedient for fair value, a NAV per share or its equivalent for purposes of valuing certain investments which:

(a) do not have a readily determinable fair value and (b) prepare their financial statements consistent with the measurement principles of an investment company or have the attributes of an investment company.

The following table lists such investments by major category as of December 31, 2020 and 2019:

2020							
Type	Strategy	NAV in Funds	# of Funds	Remaining Life	\$ Amount of Unfunded Commitments	Redemption Terms	Redemption Restrictions
Commingled funds	One fund seeks to outperform the Russell 2000 Index over a 1 to 3 year period; and one fund seeks to maximize portfolio returns while minimizing risk through an asset allocation based on measurements of the investible universe of institutional real estate.	\$ 89,190,400	2	To be determined by the respective fund manager.	N/A	One fund has daily redemption upon notice; and, one fund has quarterly redemption with 60 days notice.	N/A
2019							
Type	Strategy	NAV in Funds	# of Funds	Remaining Life	\$ Amount of Unfunded Commitments	Redemption Terms	Redemption Restrictions
Commingled funds	One fund seeks to outperform the Russell 2000 Index over a 1 to 3 year period; and one fund seeks to maximize portfolio returns while minimizing risk through an asset allocation based on measurements of the investible universe of institutional real estate.	\$ 78,533,300	2	To be determined by the respective fund manager.	N/A	One fund has daily redemption upon notice; and, one fund has quarterly redemption with 60 days notice.	N/A

The Institute also held investments, which included certificates of deposits and term deposits, totaling \$3,435,900 and \$2,537,000 as of December 31, 2020 and 2019, respectively, that were classified as investments - other on the accompanying consolidated statements of financial position. These investments do not qualify as securities, as defined by relevant guidance, and as such, fair value disclosures are not provided.

Investment income, net, for the years ended December 31, 2020 and 2019, are reflected in the accompanying consolidated statements of activities and consist of the following:

IEEE	2020	2019
Interest and dividends, net	\$ 9,868,300	\$ 12,573,600
Net realized and unrealized gains on investments	59,834,000	60,432,500
IEEE investment income, net	\$ 69,702,300	\$ 73,006,100

Investment expenses, which are netted with interest and dividends, amounted to \$1,425,700 and \$1,366,400 in 2020 and 2019, respectively.

For the years ended December 31, 2020 and 2019, investment returns related to amounts held on behalf of IEEE Foundation, Incorporated, that have not been reflected in the accompanying consolidated statements of activities, consist of the following:

IEEE FOUNDATION, INCORPORATED	2020	2019
Interest and dividends, net	\$ 748,900	\$ 944,200
Net realized and unrealized gains on investments	4,587,100	5,130,900
IEEE Foundation investment income, net	\$ 5,336,000	\$ 6,075,100

NOTE 5. LAND, BUILDINGS AND EQUIPMENT, NET

Land, buildings and equipment, carried at cost, net of the related accumulated depreciation and amortization, at December 31, 2020 and 2019 consist of the following:

	2020			2019		
	Cost	Accumulated Depreciation and Amortization	Net	Cost	Accumulated Depreciation and Amortization	Net
Buildings	\$ 17,385,900	\$ 14,985,000	\$ 2,400,900	\$ 17,385,800	\$ 14,560,300	\$ 2,825,500
Furniture, equipment, vehicles and computers	91,428,300	74,842,700	16,585,600	89,139,400	71,584,700	17,554,700
Software	11,502,000	10,795,100	706,900	19,727,900	13,567,200	6,160,700
Building improvements	21,846,400	14,089,000	7,757,400	22,271,700	17,049,500	5,222,200
	142,162,600	114,711,800	27,450,800	148,524,800	116,761,700	31,763,100
Land	836,400	-	836,400	836,400	-	836,400
Building improvements in progress	93,800	-	93,800	-	-	-
Information systems upgrade in process	7,213,300	-	7,213,300	6,815,800	-	6,815,800
Total	\$150,306,100	\$ 114,711,800	\$ 35,594,300	\$ 156,177,000	\$ 116,761,700	\$ 39,415,300

Depreciation and amortization expense amounted to \$11,430,200 and \$10,209,000 for the years ended December 31, 2020 and 2019, respectively, excluding amortization of intangible assets of \$2,573,200 and \$5,687,200 as of December 31, 2020 and 2019, respectively.

Furniture and equipment include assets acquired under capital leases of \$108,600 and \$762,300 as of December 31, 2020 and 2019, respectively. Accumulated amortization of assets recorded under capital leases amounted to \$55,000 and \$172,500 at December 31, 2020 and 2019, respectively.

During the fiscal year ended December 31, 2019, the Institute sold land and building located in the State of California for \$1,971,700, resulting in a gain on the sale totaling \$1,827,700 that has been reflected in the non-operating activities section of the accompanying consolidated statement of activities.

NOTE 6. DEBT OBLIGATIONS

The Institute maintained a credit facility, through June 1, 2019, to borrow up to an aggregate amount of \$50,000,000. The credit facility consisted of \$35,000,000 with Wells Fargo Bank, N.A. and \$15,000,000 with HSBC Bank, N.A. USA. The Institute did not renew this credit facility after maturity on June 1, 2019. The credit facility was not utilized at any time during 2019. The commitment fees charged during 2019 amounted to \$62,700.

NOTE 7. CAPITAL LEASE OBLIGATIONS

The approximate annual rental payments due under capital lease obligations for equipment are as follows:

Year	Amount
2021	\$ 110,700
2022	21,300
2023	15,700
2024	-
Total minimum lease payments	147,700
Less: Amount representing interest	(5,400)
Present value of minimum lease payments	\$ 142,300

NOTE 8. PENSION AND OTHER POST-RETIREMENT BENEFITS

The Institute sponsors two qualified pension plans and one nonqualified pension plan and other post-retirement benefit plans for its employees. In November 2006, the Board of Directors approved the freezing of its qualified employee benefit plans as of June 30, 2007 and the implementation of a defined contribution plan effective July 1, 2007. Accordingly, as of June 30, 2007, no further benefits will accrue under the qualified employee benefit plans after that date.

The following tables provide a reconciliation of the changes in the plans' benefit obligations and fair value of assets over the two-year period ended December 31, 2020, and a statement of the funded status as of December 31, 2020 and 2019:

	Pension Benefits		Other Benefits	
	2020	2019	2020	2019
<i>Reconciliation of benefit obligation:</i>				
Obligation at January 1	\$ 92,855,500	\$ 80,570,200	\$ 7,630,100	\$ 6,311,100
Service cost	240,000	240,000	232,400	188,300
Interest cost	2,349,300	2,921,400	208,000	238,700
Actuarial loss (gain)	10,509,700	13,906,600	1,049,000	1,079,700
Benefit payments	(1,879,000)	(4,782,800)	(224,300)	(187,700)
Settlements	(5,414,300)	-	-	-
Obligation at December 31	\$ 98,661,200	\$ 92,855,400	\$ 8,895,200	\$ 7,630,100
<i>Reconciliation of fair value of plan assets:</i>				
Fair value of plan assets at January 1	\$ 84,483,400	\$ 62,927,100	\$ -	\$ -
Actual return on plan assets	12,668,500	15,223,700	-	-
Employer contributions	10,000	11,115,400	224,300	187,700
Benefit payments	(1,879,000)	(4,782,800)	(224,300)	(187,700)
Settlements	(5,414,300)	-	-	-
Fair value of plan assets at December 31	\$ 89,868,600	\$ 84,483,400	\$ -	\$ -
Funded status at December 31	\$ (8,792,600)	\$ (8,372,000)	\$ (8,895,200)	\$ (7,630,100)
Accumulated benefit obligation	\$ 98,661,200	\$ 92,855,400	\$ 8,895,200	\$ 7,630,100

At December 31, 2020 and 2019, the funded status of the plans is reported on the consolidated statements of financial position as follows:

	Pension Benefits		Other Benefits	
	2020	2019	2020	2019
Current liabilities	\$ (4,200)	\$ (13,500)	\$ (307,400)	\$ (274,500)
Noncurrent liabilities	(8,788,400)	(8,358,500)	(8,587,800)	(7,355,600)
Net Amount Recognized	\$ (8,792,600)	\$ (8,372,000)	\$ (8,895,200)	\$ (7,630,100)

Cumulative amounts recognized in changes in net assets without donor restrictions and not yet recognized in net periodic benefit cost as of December 31, 2020 and 2019 consist of:

	Pension Benefits		Other Benefits	
	2020	2019	2020	2019
Net loss	\$ 17,155,900	\$ 18,152,200	\$ 2,469,500	\$ 1,483,600

The following table provides the components of net periodic benefit cost for the plans for 2020 and 2019:

	Pension Benefits		Other Benefits	
	2020	2019	2020	2019
Service cost	\$ 240,000	\$ 240,000	\$ 232,400	\$ 188,300
Interest cost	2,349,300	2,921,400	208,000	238,700
Expected return on plan assets	(3,086,900)	(2,905,000)	-	-
Amortization of net loss	983,100	1,111,800	63,100	900
Settlement loss	941,400	-	-	-
Net periodic benefit cost	\$ 1,426,900	\$ 1,368,200	\$ 503,500	\$ 427,900

Amounts recognized in changes in net assets without restrictions for the years ended December 31, 2020 and 2019 consist of:

	Pension Benefits		Other Benefits	
	2020	2019	2020	2019
Net loss	\$ 928,100	\$ 1,587,900	\$ 1,049,000	\$ 1,079,700
Amortization of net loss	(1,924,500)	(1,111,800)	(63,100)	(900)
Pension related benefits activity other than periodic benefit cost	\$ (996,400)	\$ 476,100	\$ 985,900	\$ 1,078,800

The estimated amount of net assets without restrictions to be recognized as a component of net periodic benefit cost in the next fiscal year is as follows:

	Pension Benefits	Other Benefits
Net loss	\$ 831,200	\$ 130,100

The prior service costs are amortized on a straight-line basis over the average remaining service period of active participants. Gains and losses in excess of 10% of the greater of the benefit obligation and the fair value of plan assets are amortized over the average remaining service period of active participants.

The assumptions used in the measurement of the Institute's benefit obligation are shown in the following table:

	Pension Benefits		Other Benefits	
	2020	2019	2020	2019
Weighted-average assumptions as of December 31				
Discount rate	2.19%	3.00%	2.35%	3.11%
Rate of compensation increase	N/A	N/A	N/A	N/A

The assumptions used in the measurement of the net periodic benefit cost are shown in the following table:

	Pension Benefits		Other Benefits	
	2020	2019	2020	2019
Weighted-average assumptions as of December 31				
Discount rate	3.00%	4.06%	3.11%	4.13%
Expected return on plan assets	3.80%	4.85%	N/A	N/A
Rate of compensation increase	N/A	N/A	N/A	N/A

The health care plan benefits are a flat dollar reimbursement to the retirees toward health care premiums. An increase in the reimbursement amount is not assumed.

Contributions

There are no required contributions due to the qualified pension plans during 2020 under the IRS's minimum funding regulations.

IEEE expects to contribute approximately \$4,000 to its nonqualified pension plan and approximately \$307,000 to its other post-retirement benefit plans during 2021.

Expected Benefit Payments

	Pension Benefits	Other Benefits
2021	\$ 4,930,500	\$ 307,400
2022	4,970,100	311,200
2023	5,525,300	315,800
2024	5,381,300	322,800
2025	4,988,000	333,300
2026 to 2030	24,952,900	1,825,600

Plan Assets

IEEE determines its assumptions for the expected rate of return on plan assets for its retirement plans based on ranges of anticipated rates of return for each asset class. A weighted range of nominal rates is then determined based on target allocations for each asset class. IEEE considers the expected rate of return to be a longer-term assessment of return expectations and does not anticipate changing this assumption annually unless economic conditions change significantly. The expected rate of return for each plan is based upon its expected asset allocation. Market performance over a period of earlier years is evaluated covering a wide range of economic conditions to determine whether there are reliable reasons for projecting forward any past trends.

IEEE's pension and post-retirement plan asset allocation at the end of 2020 and 2019, and the target asset allocation for 2020 and 2019 by asset category based on asset fair values are as follows:

Asset Category	Target Asset Allocation	Pension Assets at December 31		Post-Retirement Assets at December 31	
		2020	2019	2020	2019
Equity securities	10%	12%	11%	N/A	N/A
Debt securities	90%	87%	86%	N/A	N/A
Cash and cash equivalents	0%	1%	3%	N/A	N/A
Total	100%	100%	100%	N/A	N/A

Third-party investment professionals manage IEEE's pension plan assets, rebalancing assets as the Institute deems appropriate. IEEE's investment strategy with respect to its pension plan assets is to maintain a diversified investment portfolio across several asset classes targeting an annual rate of return of 5% in 2020 and 2019, respectively. To develop the expected long-term rate of return on assets assumption, the Institute considered the historical returns and the future expectations for returns for each asset class, as well as the target asset allocation of the pension portfolio.

IEEE's pension and post-retirement funds' investment strategies are to invest in a prudent manner for the exclusive purpose of providing benefits to participants. The investment strategies are targeted to produce a total return that, when combined with IEEE's contributions to the funds, will maintain the funds' ability to meet all required benefit obligations. Risk is controlled through liability driven investing. The majority of the assets are matched against the pension liability.

The Institute's investment objectives for the pension plans are to minimize the volatility of the pension assets relative to pension liabilities and to offset the required contributions. The current target asset allocations are 10% equity securities and 90% debt securities. The investment guidelines further allow the managers to keep up to 5% in cash and cash equivalents.

Investment strategies and policies for the pension plans reflect a balance of risk-reducing and return-seeking considerations. The objective of minimizing the volatility of assets relative to liabilities is addressed primarily through asset-liability matching.

All plan assets are externally managed. Investment managers are not permitted to invest outside of the asset classes or strategy for which they have been appointed. The Institute uses investment guidelines to ensure investment managers invest solely within the investment strategy for which they have been retained.

The following table prioritizes the inputs used to measure and report the fair value of the Institute's pension plan assets at December 31, 2020:

	2020			
	Level 1	Level 2	Net Asset Value	Total
Common stock:				
Consumer	\$ 1,439,000	\$ -	\$ -	\$ 1,439,000
Technology	1,781,900	-	-	1,781,900
Industrials	429,200	-	-	429,200
Healthcare	747,000	-	-	747,000
Financial services	643,100	-	-	643,100
Energy	282,800	-	-	282,800
Other	195,300	-	-	195,300
Total common stocks	5,518,300	-	-	5,518,300
Equity mutual funds	4,968,000	-	-	4,968,000
Corporate bonds	-	74,113,800	-	74,113,800
U.S. Government Securities	624,600	-	-	624,600
Municipal bonds	-	1,742,600	-	1,742,600
Foreign bonds	-	1,156,500	-	1,156,500
Collective trust fund	-	-	1,063,300	1,063,300
	\$ 11,110,900	\$ 77,012,900	\$ 1,063,300	\$ 89,187,100
Cash held for investment				100
Add: receivables for securities sold and accrued interest				681,400
Total pension plan investments				\$ 89,868,600

The following table prioritizes the inputs used to measure and report the fair value of the Institute's pension plan assets at December 31, 2019:

	2019			
	Level 1	Level 2	Net Asset Value	Total
Common stock:				
Consumer	\$ 798,500	\$ -	\$ -	\$ 798,500
Technology	919,000	-	-	919,000
Industrials	669,400	-	-	669,400
Healthcare	714,700	-	-	714,700
Financial services	941,900	-	-	941,900
Energy	88,100	-	-	88,100
Other	364,900	-	-	364,900
Total common stocks	4,496,500	-	-	4,496,500
Equity mutual funds	4,801,100	-	-	4,801,100
Corporate bonds	-	69,532,600	-	69,532,600
Municipal bonds	-	1,686,300	-	1,686,300
Foreign bonds	-	1,182,200	-	1,182,200
Collective trust fund	-	-	2,231,200	2,231,200
	\$ 9,297,600	\$ 72,401,100	\$ 2,231,200	\$ 83,929,900
Cash held for investment				200
Add: receivables for securities sold and accrued interest				553,300
Total pension plan investments				\$ 84,483,400

The Institute's policy is to recognize transfers in and transfers out of levels at the end of the respective reporting period.

The Institute uses, as a practical expedient for fair value, a NAV per share or its equivalent for purposes of valuing certain investments which: (a) do not have a readily determinable fair value and (b) prepare their financial statements consistent with the measurement principles of an investment company or have the attributes of an investment company. The following table lists such investments by major category as of December 31, 2020 and 2019:

2020							
Type	Strategy	NAV in Funds	# of Funds	Remaining Life	\$ Amount of Unfunded Commitments	Redemption Terms	Redemption Restrictions
Collective trust fund	Seeks the highest level of current income possible consistent with the preservation of capital and maintenance of liquidity.	\$ 1,063,300	1	Subject to the determination of the respective fund manager.	N/A	Daily redemption, upon notice.	N/A
2019							
Type	Strategy	NAV in Funds	# of Funds	Remaining Life	\$ Amount of Unfunded Commitments	Redemption Terms	Redemption Restrictions
Collective trust fund	Seeks the highest level of current income possible consistent with the preservation of capital and maintenance of liquidity.	\$ 2,231,200	1	Subject to the determination of the respective fund manager.	N/A	Daily redemption, upon notice.	N/A

The Institute also has a defined contribution 401(k) Savings and Investment Plan (the "Plan") for employees, who are eligible to participate after the start of the next pay period following 30 days of employment. Under the Plan, employees may generally contribute between 2% to 16% of their salary; however, not in excess of IRS limitations. The Institute provides a 100% matching contribution up to 4% of each employee's salary. The Institute contributed \$4,937,300 and \$4,779,600 on behalf of eligible employees to the Plan in 2020 and 2019, respectively. Amounts payable at December 31, 2020 and 2019 totaled \$65,300 and \$31,100, respectively, and are included in the current portion of accrued pension and other benefits in the accompanying consolidated statements of financial position.

The Institute has established a Defined Contribution Retirement Plan under which it makes contributions to accounts established for each employee according to a predetermined schedule of contributions. The employee's retirement benefit is the value of the account. All contributions under the Defined Contribution Retirement Plan are made by the Institute and are not funded through salary deductions (employee contributions). Vesting occurs at the completion of each year of service at a rate of 25% per year until 100% after four years. The Institute contributed \$10,825,900 and \$9,836,700 to this plan in 2020 and 2019, respectively. Amounts payable at December 31, 2020 and 2019 totaled \$160,200 and \$73,200, respectively, and are included in the current portion of accrued pension and other benefits in the accompanying consolidated statements of financial position.

Effective September 1, 2002, the Institute implemented a 457(b) plan for those highly compensated employees who have reached the IRS maximum 401(k) contribution for the year. These employees have the option of continuing their contributions up to the maximum dollar amount under section 457(e)(15) of the Internal Revenue Code of 1986, as amended. All other criteria for eligibility follow the same guidelines as the 401(k) plan. The amounts of \$7,133,200 and \$6,212,000 pertaining to obligations due under the 457(b) plan are accrued and included in accrued pension and other employee benefits at December 31, 2020 and 2019, respectively, and the related 457(b) plan assets are included in investments on the accompanying consolidated statements of financial position.

NOTE 9. NATURAL EXPENSES

The following table summarizes the Institute's natural expense classification presented below for the years ended December 31, 2020 and 2019.

	2020						
	Program Services					Supporting Services	
	Memberships	Periodicals and Media	Conferences	Standards	Public Imperatives	General and Administrative	Total
People costs and related expense	\$ 44,099,200	\$ 82,152,200	\$ 29,393,700	\$ 19,741,100	\$ 4,649,000	\$ 1,073,900	\$ 181,109,100
Conference event related expense	116,000	-	36,167,500	-	22,000	33,200	36,338,700
Commission, licensing and royalty	1,620,200	39,744,900	854,000	171,600	15,700	-	42,406,400
Travel, meeting and accomodation	3,629,300	1,569,500	1,057,500	2,015,500	220,500	78,700	8,571,000
Printing publishing expense	6,845,200	12,020,100	2,122,000	402,900	439,300	900	21,830,400
Depreciation and amortization	1,598,600	6,614,800	1,195,400	2,620,100	55,200	1,919,300	14,003,400
Consultants and contractors	2,434,100	6,803,100	1,426,500	6,305,400	323,300	172,900	17,465,300
Maintenance expense	1,481,000	4,059,400	1,314,800	512,800	17,600	192,900	7,578,500
Computer software and related expense	2,233,600	4,460,400	1,306,900	1,342,100	76,700	56,100	9,475,800
General office expenses	3,487,700	3,072,300	416,900	214,200	112,200	66,400	7,369,700
Professional fees	1,549,900	4,173,000	576,900	245,400	-	1,500	6,546,700
Marketing and promotions	1,632,400	2,749,500	546,000	10,200	80,700	26,300	5,045,100
Grants, awards, scholarships and others	926,700	325,200	380,200	40,600	4,072,800	72,300	5,817,800
Operating leases and related expense	745,800	222,900	89,500	31,000	195,100	3,370,200	4,654,500
Insurance expense	161,300	237,800	597,600	164,000	15,900	63,700	1,240,300
Communication related services	164,900	588,600	42,200	66,400	3,600	6,300	872,000
Bad debt expense	285,600	361,100	133,000	120,200	-	9,400	909,300
Various other expenses	7,541,600	2,681,300	7,344,800	3,727,200	941,900	-	22,236,800
Total	\$ 80,553,100	\$ 171,836,100	\$ 84,965,400	\$ 37,730,700	\$ 11,241,500	\$ 7,144,000	\$ 393,470,800

	2019						
	Program Services					Supporting Services	
	Memberships	Periodicals and Media	Conferences	Standards	Public Imperatives	General and Administrative	Total
People costs and related expense	\$ 43,103,100	\$ 88,242,500	\$ 33,724,700	\$ 17,729,100	\$ 4,787,000	\$ 3,148,500	\$ 190,734,900
Conference event related expense	560,700	50,900	107,606,200	-	47,600	181,600	108,447,000
Commission, licensing and royalty	666,600	42,030,500	781,400	134,500	1,700	78,700	43,693,400
Travel, meeting and accomodation	12,556,100	8,222,800	5,228,100	6,927,800	821,000	811,200	34,567,000
Printing publishing expense	7,140,300	12,032,300	2,274,600	799,400	177,000	5,000	22,428,600
Depreciation and amortization	1,537,900	9,790,100	1,946,100	649,900	54,200	1,918,000	15,896,200
Consultants and contractors	2,618,600	5,360,200	1,601,400	4,934,400	273,800	732,400	15,520,800
Maintenance expense	1,709,800	3,688,500	2,669,300	538,300	-	1,552,300	10,158,200
Computer software and related expense	1,632,100	4,122,000	1,873,000	1,014,700	66,800	188,600	8,897,200
General office expenses	3,601,600	3,583,100	511,300	197,000	184,600	200,400	8,278,000
Professional fees	1,920,000	3,887,300	982,100	203,400	-	30,700	7,023,500
Marketing and promotions	1,643,200	3,801,800	372,300	6,600	125,100	192,900	6,141,900
Grants, awards, scholarships and others	1,129,100	264,500	596,000	76,500	3,636,300	199,500	5,901,900
Operating leases and related expense	1,341,800	1,095,200	919,400	215,100	367,500	769,200	4,708,200
Insurance expense	92,400	243,200	478,100	149,900	16,000	176,800	1,156,400
Communication related services	200,700	556,700	100,700	72,900	6,600	4,900	942,500
Bad debt expense	49,900	304,300	17,900	3,400	9,700	-	385,200
Various other expenses	8,186,900	4,371,800	4,804,700	4,610,300	1,745,200	-	23,718,900
Total	\$ 89,690,800	\$ 191,647,700	\$ 166,487,300	\$ 38,263,200	\$ 12,320,100	\$ 10,190,700	\$ 508,599,800

Management has reviewed all overhead costs and determined that it is appropriate to allocate the majority of these costs to the program services. There are a number of allocation methodologies that are used focusing on the location where the costs are incurred along with staffing levels and program service cost incurred prior to allocations. Included in these allocations are approximately \$49 million and \$61 million of Society administrative, committee and executive expenses and approximately \$51 million and \$55 million of indirect corporate overhead charges in 2020 and 2019, respectively.

NOTE 10. ADDITIONAL INFORMATION PRESENTED BY ACTIVITY

The following presents the Institute's consolidated financial results presented in a traditional surplus or loss format for the years ended December 31, 2020 and 2019. This format differs from the accompanying consolidated statements of activities, which present the financial results by the types of products and services sold. The surplus and loss presents the same data pertaining to the nature of activities.

	2020	2019
Net Revenues	\$ 464,633,200	\$ 556,769,200
Less: Cost of revenues	159,033,200	245,868,200
Direct contribution to surplus	\$ 305,600,000	\$ 310,901,000
Expenses:		
Selling	\$ 35,158,000	\$ 39,988,700
Marketing	33,013,100	32,476,300
Product design	6,715,100	6,718,400
Supporting services	148,309,900	171,228,000
Contribution to surplus	\$ 82,403,900	\$ 60,489,600
Public imperatives, net	(8,839,400)	(9,604,400)
Non-operating activities:		
Investment income, net	\$ 69,702,300	\$ 73,006,100
Loss on sale and dissolution of IEEE GlobalSpec, Inc.	(10,691,000)	-
Pension benefit (expense)	10,400	(1,554,900)
Surplus before tax	132,586,200	122,336,400
Income tax benefit	499,400	744,700
Net surplus after tax	\$ 133,085,600	\$ 123,081,100

A description of each line item is discussed below:

Revenues: Net earnings from the sales of products and services.

Cost of Revenues: Direct costs incurred in producing or providing products and services that are sold and generate revenue.

Selling: Expenses incurred in the effort to sell products or services, includes commissions and other related expenses.

Marketing: Expenses incurred to generate additional sales of existing products or services, including brand awareness, promotions, displays and media.

Product Design: Expenses incurred in relation to developing new products and services to be sold in the future.

Supporting Services: This caption includes operational support and shared services. Operational support includes expenses that are indirectly related to the sale of products and services which generate revenue (e.g., costs associated with conference and event management, volunteer engagement and executive or governance functions). Shared services include general overhead such as Human Resources, Finance, Information Technology, Facilities and other related expenses. The presentation of supporting services, as reported on the accompanying consolidated statements of activities, reflects an allocation of such costs amongst the lines of operation specifically benefited.

Public Imperatives: Public imperatives are outreach and public awareness efforts to inform the public and members about technology and the engineering profession.

NOTE 11. LIQUIDITY RESOURCES

The Institute's primary source of operating funds is derived from the sale of products and services for its memberships, periodicals, conferences and standards. These activities are intended to advance technology for humanity. The Institute has various sources of liquidity at its disposal, including cash and cash equivalents, and investments.

The following table reflects the Institute's financial assets as of December 31, 2020 and 2019 reduced by amounts that are not available to meet general expenditures within one year of the statement of financial position date because of contractual restrictions or donor restrictions.

Financial assets as of December 31	2020	2019
Cash and cash equivalents	\$ 20,126,300	\$ 22,122,700
Accounts receivable, less allowance for doubtful accounts	27,451,200	41,699,100
Investments, at fair value	813,132,500	649,793,000
Investments - other	3,435,900	2,537,000
Total financial assets available within one year	864,145,900	716,151,800
Less:		
IEEE Board-designated net assets	18,604,200	20,400,000
Amounts held on behalf of IEEE Foundation, Incorporated	54,112,600	48,367,900
Amounts subject to expenditure for specified donor purposes	1,415,700	1,298,900
Amounts relating to endowment funds with donor restrictions	633,100	589,300
Total amounts unavailable for general expenditures within one year	74,765,600	70,656,100
	\$ 789,380,300	\$ 645,495,700

NOTE 12. NET ASSETS AND ENDOWMENT FUNDS

Net assets with donor restrictions are available for the following purposes at December 31, 2020 and 2019:

	2020	2019
Grant funds held for specific purposes	\$ 737,700	\$ 880,400
Funds held for awards, medals and other specific purposes	678,000	418,500
Donor-restricted endowment funds, including accumulated unspent appreciation of \$441,700 and \$397,900	633,100	589,300
	\$ 2,048,800	\$ 1,888,200

Net assets were released from donor restrictions by incurring expenses satisfying the restricted purposes for the years ended December 31, 2020 and 2019 as follows:

	2020	2019
Grant funds released for specific purposes	\$ 128,200	\$ 115,900
Funds released for awards, medals and other specific purposes	15,200	10,200
	\$ 143,400	\$ 126,100

Donor-imposed endowment net assets at December 31, 2020 and 2019 consist of assets that have been restricted by donors to be invested in perpetuity to provide a permanent source of income. The Institute's donor-restricted endowment consists of eleven (11) individual funds established principally for awards.

On September 17, 2010, the State of New York passed the NYPMIFA, its version of the Uniform Prudent Management of Institutional Funds Act. All not-for-profit organizations formed in New York must apply this law. The Institute classifies as net assets with donor restrictions, unless otherwise stipulated by the donor: (a) the original value of gifts donated to its donor-restricted endowment, (b) the original value of subsequent gifts to its donor-restricted endowment and (c) accumulations to its donor-restricted endowment made in accordance with the direction of the applicable donor gift instrument at the time the accumulation is added to the funds.

In accordance with NYPMIFA, the Institute considers the following factors in making a determination to appropriate or accumulate donor-restricted endowment funds: the purpose, duration and preservation of the endowment fund; expected total return on endowment investments; general economic conditions; the possible effects of inflation and deflation; other resources of the Institute; and, the investment policy of the Institute.

The Institute has adopted investment management and spending policies for its donor-restricted endowment assets which totaled \$633,100 and \$589,300 as of December 31, 2020 and 2019, respectively. This supports the objective of providing a sustainable and increasing level of donor-restricted endowment income distribution to support the Institute's activities while seeking to maintain the purchasing power of the endowment assets. The Institute's primary investment objective is to maximize total return within reasonable and prudent levels of risk while maintaining sufficient liquidity to meet disbursement needs and ensure preservation of capital.

To satisfy its long-term rate-of-return objectives, the Institute relies on a total return strategy, the objective of which is to achieve a return consisting of a combination of current income and capital appreciation, without regard to an emphasis on either, recognizing that changes in market conditions and interest rates will result in varying strategies in an attempt to optimize results. The endowment portfolio is diversified among various investment classes and strategies to help reduce risk.

The following table summarizes the Institute's total return on donor-restricted endowment investments and the changes in donor-restricted endowment net assets for the years ended December 31, 2020 and 2019:

	2020		
	Without Donor Restrictions	With Donor Restrictions	Total
Donor-restricted endowment funds	\$ -	\$ 633,100	\$ 633,100

	Without Donor Restrictions	With Donor Restrictions	Total
Endowment assets, beginning of year	\$ -	\$ 589,300	\$ 589,300
Dividends and interest	-	10,100	10,100
Net realized and unrealized appreciation in fair value of endowment assets	-	48,500	48,500
Endowment return used for operations	-	(14,800)	(14,800)
Endowment assets, end of year	\$ -	\$ 633,100	\$ 633,100

	2019		
	Without Donor Restrictions	With Donor Restrictions	Total
Donor-restricted endowment funds	\$ -	\$ 589,300	\$ 589,300

	Without Donor Restrictions	With Donor Restrictions	Total
Endowment assets, beginning of year	\$ -	\$ 534,000	\$ 534,000
Dividends and interest	-	13,200	13,200
Net realized and unrealized appreciation in fair value of endowment assets	-	51,900	51,900
Endowment return used for operations	-	(9,800)	(9,800)
Endowment assets, end of year	\$ -	\$ 589,300	\$ 589,300

NOTE 13. OPERATING LEASES

At December 31, 2020, minimum rental commitments due under noncancelable operating leases for office space and computer equipment are as follows:

Year	Amount
2021	\$ 2,734,000
2022	2,344,800
2023	2,210,400
2024	2,059,700
2025	1,914,500
Thereafter	2,630,500
	\$ 13,893,900

The leases for the office space are subject to escalation. Total rent expense for noncancelable operating leases amounted to \$3,358,600 and \$4,216,600 in 2020 and 2019, respectively.

Letters of Credit

At December 31, 2020, the Institute had irrevocable standby letters of credit with Wells Fargo Bank, N.A., in the amount of \$583,000, which serves as security deposit as required by the terms of its lease agreements with Three Park Avenue Building Company, LP and 2001 L Street, LLC, respectively.

At December 31, 2020, the Institute had issued standby letters of credit in relation to certain dealers' agreements and VAT tax payments totaling \$411,000 with HSBC Bank USA, N.A. The Institute is charged 2% of the face amount, upon issuance, of the standby letters of credit.

Litigation

The Institute, in the normal course of its operations, is a party to various legal proceedings and complaints, some of which are covered by insurance. While it is not feasible to predict the ultimate outcomes of such matters, management of the Institute is not aware of any claims or contingencies, which are not covered by insurance, that would have a material adverse effect on the Institute's consolidated financial position, changes in net assets or cash flows.

NOTE 14. RELATED-PARTY TRANSACTIONS

IEEE Foundation, Incorporated

The Institute has transactions with IEEE Foundation, Incorporated (the "Foundation"), a related organization, which performs activities in support of the scientific and educational functions and programs of the Institute. The Institute made cash contributions of \$423,000 and \$409,000 in 2020 and 2019, respectively, to the Foundation.

The Foundation has no staff and thus, receives certain accounting and administrative services from IEEE. The Foundation reimbursed IEEE for the cost of such services, which amounted to \$830,800 and \$809,900 during 2020 and 2019, respectively. The Institute provided fundraising administrative services (contributed services) during 2020 and 2019 that were not reimbursed by the Foundation, that were valued at \$1,221,300 and \$1,286,600 during 2020 and 2019, respectively.

The Institute held on deposit \$54,112,600 and \$48,367,900 from the Foundation at December 31, 2020 and 2019, respectively, and is separately reported on the accompanying consolidated statements of financial position. The Institute invests these amounts on behalf of the Foundation. Receivables due from the Foundation include grants receivable of \$889,200 and \$1,807,400 at December 31, 2020 and 2019, respectively, and other receivables of \$38,400 and \$79,500 at December 31, 2020 and 2019, respectively, and are included in accounts receivable on the accompanying consolidated statements of financial position. Amounts due to the Foundation of \$91,800 and \$121,600 at December 31, 2020 and 2019, respectively, are included in accounts payable and accrued expenses on the accompanying consolidated statements of financial position.

NOTE 15. COVID-19

The COVID-19 pandemic, whose effects first became known in January 2020, caused economic interruptions through mandated and voluntary closings of businesses and organizations throughout the United States. The extent of the impact of COVID-19 on the Institute's operational and financial performance will depend on certain developments, including the duration and spread of the outbreak and its impact on the Institute's donors, employees, conference delays and vendors, all of which at present, cannot be fully determined. Accordingly, the extent to which COVID-19 may impact the Institute's financial position and changes in net assets and cash flows is uncertain and the accompanying consolidated financial statements include no adjustments relating to the effects of this pandemic.

As a result of the pandemic, the Institute voluntarily closed its offices in North America, Europe and Asia. In many places, governments also issued "stay-at-home" orders that required businesses to remain closed. The Institute worked together as a worldwide organization and kept moving forward by being agile and responsive with its activities. In-person conferences that were originally scheduled to take place from February 2020 through December 2020 were cancelled or transitioned to virtual events. The impact of the pandemic continues to create uncertainty about the future economic outlook and poses a significant challenge to conference activities in 2021 due to event cancellations. The Institute continues to adhere to guidance from the Centers for Disease Control and Prevention and state, local and international governments.

IEEE Office Locations

Corporate Headquarters

3 Park Avenue, 17th Floor
New York, NY 10016-5997 USA
Phone: +1 212 419 7900

Operations Center

445 and 501 Hoes Lane
Piscataway, NJ 08854-4141 USA
Phone: +1 732 981 0060

California Office

10662 Los Vaqueros Circle
P.O. Box 3014
Los Alamitos, CA 90720-1314 USA
Phone: +1 714 821 8380

Washington D.C. Office

2001 L Street, N.W. Suite 700
Washington, DC 20036-4928 USA
Phone: +1 202 785 0017 (IEEE-USA)
+1 202 371 0101 (Computer Society)

Global IEEE Institute for Engineers, India

26/1, Fifth Floor, WTC-Brigade Gateway Campus
Dr. Rajkumar Road, Malleswaram West
Bangalore - 560 055, Karnataka, India
Phone: +91 80 4944 4333

IEEE Asia-Pacific Limited

1 Fusionopolis Walk, #04-07
South Tower
Solaris, Singapore 138628
Phone: +65 6778 2873

IEEE, Inc. Representative Office, China

Room 1503, South Tower, Raycom
InfoTech Park C,
No. 2 Kexueyuan South Road,
Haidian District, Beijing, 100190, China
Phone: +86 10 8286 2025

IEEE Japan Office

E-1904 Aoyama-Twin Tower
1-1-1 Minami-aoyama
Minato-ku, Tokyo 107-0062, Japan
Phone: +81 3 3408 3118

IEEE Technology Centre GmbH

Heinestraße 38
1020 Vienna, Austria
Phone: +43 1 213004 332



www.ieee.org