



Engagement opportunities for engineers and technology developers in the health sector with the UN Technology Facilitation Mechanism and beyond

New York, 17 December 2020

[Background on the UN Technology Facilitation Mechanism](#)

In the 2010s, new direct entry points were created for scientists and engineers at the highest levels of the UN, most notably the *UN Technology Facilitation Mechanism (TFM)*, the *Global Sustainable Development Report*, and the *High-level Political Forum on Sustainable Development*. Most relevant for engineers in the health sector is the Technology Facilitation Mechanism which firmly established science and technology discussions between governments and stakeholders at the UN. It provided for the first time a global mechanism to facilitate and share technology solutions and promote substantive discussions among government officials, scientists and other stakeholders from all of society, in all countries. To-date, under the TFM umbrella more than four thousand scientists, engineers, innovators, entrepreneurs, policy makers and civil society representatives have met to discuss and showcase science, technology and innovation (STI) solutions for SDGs. Since its inception, the TFM has discussed emerging technologies in the health sector and beyond and their wider societal and policy impacts issues. Examples include artificial intelligence, antibiotic resistance, and technology solutions for COVID-19. The TFM comprises a UN interagency task team (IATT) which brings together 43 UN entities and their external partners in ten work streams; a 10-Member-Group of High-level Representatives of Scientific Community, Private Sector and Civil Society appointed by the Secretary General (10-Member-Group); an online platform (2030 Connect) for sharing technology solutions and knowledge resources; as well as the annual Multi-stakeholder Forum on Science, Technology and Innovation for the Sustainable Development Goals (STI Forum). *Overall contact:* Shantanu Mukherjee, mukherjee1@un.org.

[Partnering with and/or submit your health technology solutions to the TFM online platform “2030 Connect”](#)

2030 Connect is a UN online platform to brings together and increasing range of resources, from publications to training opportunities to technology offers and requests. Please consider submitting specific health technology solutions to the platform or partnering with it, <https://tfm2030connect.un.org/>. Current partners in this initiative include: OpenAIRE, UNU-MERIT, UNFCCC’s TT:CLEAR and CTCN, ITU’s WSIS Stocktaking Platform, UNESCO’s World Science Forum, CASEarth, WIPO Match, WIPO GREEN, WIPO Re:Search, Green Technology Bank, European Enterprise Network, Yet2, OICT’s Unite Ideas, GSSD Expo Solutions, ESA’s Space Solutions for SDGs, Global Innovation Exchange, IAEA CONNECT, eTISC platform for the Technology and Innovation Support Centers, UNTIL labs, Startup Nation Central, and OECD’s and WB’s Innovation Policy Platform. *Contact:* Stephanie Rambler rambler@un.org.

[Actively participate in the STI Forum and related initiatives and conferences \(e.g., GSTIC, GSS, GIE\) and participate in the annual UN innovation competition](#)

Every year the *Multi-stakeholder Forum on Science, Technology and Innovation for the SDGs* (STI Forum) is being held in New York to collect views and ideas from science, engineering, private sector and governments, the outcomes of which serve as a formal input to the review of the SDGs in the High-level Political Forum on Sustainable Development in July. The next STI Forum from 4 to 5 May 2021 will focus on the overall theme of COVID-19 recovery but will also address wider health technology solutions. You may want to consider participating in the Forum and possibly even organizing a side event to showcase your health technology solutions or initiatives. You may also want to submit your technology solutions to the annual UN innovation competition - the winners of which will be invited to exhibit their work at the Forum. Other engagement possibili-

ties include running policy hackathons or organizing your own event providing inputs to the STI Forum. The STI Forum has led to various STI partnerships, including within and beyond the UN system, and key initiatives and conferences – e.g., the Global Sustainable Technology and Innovation Conference series (G-STIC), the Global Solution Summit (GSS), and the Global Innovation Exchange (GIE) - have provided important contributions. Hence, contributions to these initiatives would also ultimately be contributions to the STI Forum. Registration for STI Forum participation and the call for innovations are expected to open around February 2021. Please check back here: <https://sustainabledevelopment.un.org/tfm>. *Contact:* Shantanu Mukherjee, mukherjee1@un.org

[Prepare science-policy brief in your area of expertise as inputs for UN reports on the socio-economic and environmental impacts of rapidly emerging health technologies](#)

The Interagency Task Team on Science, Technology and Innovation for the SDGs is calling upon scientists, engineers, economists and policy analysts to contribute to UN reports on the economic, environmental and social impacts of new and rapidly emerging technologies that pose significant challenges for institutions to adapt. For 2021, much interest is in new digital technologies in the health sector and in the context of COVID-19. Previous briefs have typically addressed automation, robotics, artificial intelligence, biotechnology, nanomaterials, and various digital technologies. Please consider submitting a *science-policy brief* in the area of your expertise, comprising abstract, outline of empirical facts and issues, and policy recommendations. The briefs are limited to 1,600 words (including tables and figures but excluding any annexes) and subject to peer-review. Accepted individual briefs and papers will be published on the UN Website and considered as inputs for UN reports and presentations. *Contact:* Richard Roehrl roehrl@un.org.

[Get nominated for the 10-Member-Group of High-level Representatives of Scientific Community, Private Sector and Civil Society in support of the TFM](#)

Every two years, the UN Secretary General appoints the 10-Member Group of High-level Representatives of Scientific Community, Private Sector and Civil Society (10-Member-Group). The 10-Member-Group works with the UN system to prepare the annual STI Forum and supports the further development and operations of the TFM online platform 2030 Connect. It is also actively involved in capacity building and analytical work with the UN interagency task team. They are internationally recognized in their respective areas of work and bring diverse expertise and experience across disciplines on science, technology, innovation and entrepreneurship. As representatives of various stakeholder groups, they provide a link to the academies, universities, NGOs, and the private sector. Since its inception, each 10-Member-Group has had one or two representatives of health science and technology. Please check the website for the next call: <https://sustainabledevelopment.un.org/tfm#group>. *Contact:* Shantanu Mukherjee, mukherjee1@un.org

[Contribute case studies and technical expertise to the UN capacity building on STI roadmaps and STI policy](#)

Contribute case studies and your technical expertise in the health sector for the training and capacity building undertaken by the UN interagency team (IATT). The team - in cooperation with the World Bank, the government of Japan and the EU's Joint Research Centre – implements several pilot countries in the development of national science, technology and innovation roadmaps for the SDGs, and a “Partnership in Action on STI for SDGs Roadmaps” is providing an entry point for engagement. Related interagency work supports government officials through training on a range of science, technology and innovation policy issues, for which case studies are particularly useful. *Contact:* Wei Liu liuw@un.org.

Engineers “of all stripes” sought for the UN Technology Access Partnership to support COVID-19 response

The *UN Technology Access Partnership* is an important initiative of the LDC Tech Bank, WHO, UNCTAD and UNDP. It is cornerstone of the UN’s coordinated approach to strengthen developing countries’ responses to COVID-19 and increase access to lifesaving health technologies.

Look out for and apply to join our roster of experts: In 2021 the Tech Access Partnership will be creating a roster of experts who will help us support technology seekers to learn from those with expertise in technology transfer and local production. Engineers who have experience *sharing and adapting know-how* via transfer of knowledge to support local manufacturing up to global standards via technical specifications and proper operation procedures, and engineers involved in *scaling local capacity* through strengthening of local skills base and supporting local manufacturers overcome technical or regulatory issues to successfully produce and deploy technology are welcome to join the roster.

Engineer and inventor? Deposit your technological innovation for the future use of technology seekers in LDCs on our dedicated platform www.techaccesspartnership.net. We particularly welcome technologies that are open source and regulatory approval. With our current focus on COVID-19 technologies for PPE, ventilators or diagnostics are our priority focal areas. All technologies deposited are subject to vetting by WHO or a stringent regulatory authority.

Contact: Spring Gombe, spring.gombe@un.org



ENHANCE PATIENT CARE AND OUTCOMES FOR ALL

IEEE SA HEALTHCARE & LIFE SCIENCE PRACTICE

The IEEE SA Healthcare and Life Sciences Practice is a global platform of excellence bringing together committed volunteer stakeholders to evaluate, validate, and develop solutions for establishing trust in new technology applications that will afford the right to safety, security, and protection of life.

The practice is focused on three main priority areas to help address the obstacles to universal and sustainable quality of care for all individuals:

- **Clinical health:** New technology applications enabling a patient-driven approach to monitoring, diagnosis, and therapeutic delivery with precision and efficiency for all patients.
- **Bio/pharmaceutical value chain:** Optimizing the pharmaceutical value chain from R&D through drug distribution with new technology applications that enable more inclusive, safe and efficacious approach to enhancing patient outcomes.
- **Global wellness:** Enabling foundational technology frameworks for immediate response to national emergencies, disease outbreaks, and climate impact on food sustainability and security, while protecting the security and privacy of the most vulnerable.

The HLS practice community helps to establish programs, activities, standards, events, workshops and other initiatives to further these causes. Participate in existing programs or instantiate a new one.

Learn more at ieeesa.io/hls

GLOBAL INITIATIVES IN PROGRESS



IEEE Global Wearables and Medical IoT, Interoperability & Intelligence (WAMIII) Program

The WAMIII program cultivates a global community of multi-disciplinary stakeholders to openly collaborate, build consensus, and develop solutions that will enable:

- Standard frameworks for a seamless, secure and validated Personal Patient Area Networks
- Data portability, compatibility and interoperability from device to device and device to EHR
- Frameworks to help enable patients with the ability to consent to share their device data
- A global certification system that can assure patient security and privacy

Learn more at ieee-wamiii.org

Technology And Data Harmonization Enabling Decentralized Clinical Trials Industry Connections Program

A global multidisciplinary stakeholder participating in an open collaborative training and testing program to digitalize workflows from study design to end point validation while establishing trust and validation in the use of decentralized health technologies and toolkits for this application.

Learn more at standards.ieee.org/



Transforming the Telehealth Paradigm: Sustainable Connectivity, Accessibility, Privacy, and Security for All— Industry Connections Program

Collectively address the challenge inhibiting accessible, secure, and private connections providing quality and sustainable access to immediate and critical care for immobilized and unconnected patients.

Learn more at standards.ieee.org/industry-connections/transforming-telehealth.html





ENHANCE PATIENT CARE AND OUTCOMES FOR ALL

WHO SHOULD PARTICIPATE IN HEALTHCARE & LIFE SCIENCE ACTIVITIES & PROGRAMS?

This is a global multidisciplinary stakeholder program:

- Bio/Pharmaceutical
- Clinical and Research laboratories
- Scientists
- Regulatory Professionals
- Scientific and industry researchers
- Clinicians
- Clinical Trials Design & Operations Professionals
- Health Insurance Payors (public or private)
- Health Wearable Technology developer (software/hardware)
- Hospital/Health System—Innovation and Data Project Leads
- Medical Device Manufacturers—product design or engineering
- Medical Device Software—design or engineering
- Micro-Electro-Mechanical Systems (MEMS) product design or engineering
- Sensor Development
- Tele/Communications Network Engineering
- Cloud Storage
- Patient Advocacy
- Blockchain/DLT Technologist
- Biosensor/IoMT developer
- Mobile Health App Developer
- Digital Therapeutics Developer/Technologist
- Other: Enthusiast not mentioned in this list

OPPORTUNITIES TO LEARN AND ENGAGE

WAMIII VIRTUAL TALK SERIES



The **WAMIII virtual talks series** will continue to convene and educate the global community of technologists, clinicians, healthcare professionals, regulatory, patient advocates, bio/pharma professionals and any other stakeholder who have a common interest in developing solutions around the safe, responsible and validated use of connected wireless medical devices in, on, and around us.

Get access to all sessions at standards.ieee.org/events/wamiii/virtual-talk-series-2020.html

RE-THINK HEALTH PODCAST



In the five-part **Re-Think Health Season 1**, we will share expert insights into the latest technology applications, vet stakeholders' unresolved concerns, and motivate progressive committed thinkers to take an action to collaborate, build consensus and develop solutions for trusted and validated adoption.

Listen now at standards.ieee.org/practices/healthcare-life-sciences/rethink-health.html

SHARE INSIGHT & CONTRIBUTE TO SOLUTIONS

Is there a problem that needs to be addressed/streamlined/leverage new tech?

Have an exciting case study or potential solutions to adoption of new technologies that you'd like present to global community of stakeholders?

Do you have an interest or would like to participate in technology/data standards development?

Contact: **Maria Palombini, IEEE SA Healthcare Life Sciences Practice Lead**, m.palombini@ieee.org



The [IEEE Global Artificial Intelligence Systems \(AIS\) Well-being Initiative](#) recently launched and all are welcome and invited to join.

The goal of this Industry Connections group is to continue and proliferate the existing work of the IEEE Standards Association focused on well-being and technology building on the [IEEE Std 7010™-2020](#), IEEE Recommended Practice for Assessing the Impact of Autonomous and Intelligent Systems on Human Well-Being. The group is also drawing on the [well-being chapter of Ethically Aligned Design](#).

Directly mirroring and supporting IEEE's tagline of "*Advancing Technology for Humanity*", this well-being initiative will continue the pioneering work of IEEE to provably align and prioritize the increase of human well-being and ecological sustainability by providing "AIS creators" (corporations, engineers, data scientists, academics, marketers, policy makers, educators) and end users the resources, knowledge, and tools needed to support a shift whereby AIS creators are able and willing to help safeguard and improve human well-being and ecological sustainability through their AIS creations today and into the future.

For more information or to join, please email: WellBeingInitiative@ieee.org.

IEEE Neuroethics Framework

Addressing the **Ethical, Legal and Social** Implications of Neurotechnology

The Institute of Electrical and Electronics Engineers (IEEE) is the world's largest technical professional organization dedicated to advancing technology for the benefit of humanity.

IEEE Brain was formed as a Future Directions initiative within IEEE, with the mission of facilitating cross-disciplinary collaboration and coordination to advance research, standardization and development of innovative tools and technologies in the field of neuroscience to treat diseases and improve lives.

As part of our effort to support the neuroengineering community, the IEEE Brain Neuroethics Subcommittee was established to create a neuroethical framework to facilitate the development of guidelines for engineers working on new neurotechnologies. The goal for this framework is to educate engineers, applied scientists, and practitioners about the ethical, legal, and social issues and implications of their specific area of work without the need to digest a large body of neuroethical literature. To this end, the IEEE Brain neuroethical framework is organized as a matrix of specific types of neurotechnologies and their current and potential applications. In this framework, the columns represent different types of neurotechnology, and the rows represent applications of these technologies. Each element in the matrix will expand to highlight the ethical, legal, and social issues generated by a particular neurotechnology when used in specific contexts and applications.

The details within this matrix are being developed through ongoing collaboration with a team of engineers, scientists, clinicians, and ethicists. The resulting guidelines are intended to act as a "living document" that evolves with new technology and new ethical, legal, and social issues, ideas, and perspectives. Because each element can stand alone, we can update the elements of the matrix to address change, and add new rows and columns as new technologies and applications emerge. In this way, the IEEE Brain neuroethical framework will provide an iteratively current, practical resource for informing and guiding ethically sound research and use of neurotechnologies.

IEEE Brain Neuroethics Subcommittee

James Giordano, PhD, MPhil, Georgetown University (neuroscientist/neuroethicist) - Chair

Laura Cabrera, PhD, Michigan State University (engineer/ethicist)

Jennifer Chandler, JD, University of Ottawa (lawyer)

Seth Elkin Frankston, PhD, U.S. Army CDC Soldier Center (neuroscientist)

Jack Judy, PhD, University of Florida (electrical/biomedical engineer)

Adolfo Ramirez-Zamora, MD, University of Florida (neurologist)

Peter Reiner, VMD, PhD, University of British Columbia (neuroscientist/neuroethicist)

Jacob Robinson, PhD, Rice University (neuroengineer)

Laura Specker Sullivan, PhD, College of Charleston (philosopher/ethicist)

John Shook, PhD, University of Buffalo (philosopher)

William 'Jamie' Tyler, PhD, Arizona State University (neuroscientist)

Brett Wingeier, PhD, Halo Neuroscience (biomedical engineer)

Get Engaged » Help create the guidelines in your area of expertise

Complete online form to participate: tiny.cc/engagelEEneuroethics

IEEE Neuroethics Framework

Addressing the **Ethical, Legal and Social Implications of Neurotechnology**

TECHNOLOGIES / METHODS

	 Recording/ Sensing Technologies to capture information about or from the nervous system	 Stimulating/ Actuating Technologies to stimulate or modulate the nervous system	 Closed-Loop Technologies that combine recording / sensing with stimulation / actuation to control the nervous system	 Direct Physical and Biological Modification Technologies to physically alter the nervous system by modifying physiology, and/or specific systems or sub-systems	 Augmentation and Facilitation Technologies to support or expand the existing function of the nervous system
 Medical Technologies for diagnostics or treatment of infirmity and disease, including direct-to-consumer	TBD	TBD	TBD	TBD	TBD
 Wellness Tools for active pursuit of a healthy and fulfilling life; improving physical, mental, and social well-being	TBD	TBD	TBD	TBD	TBD
 Education Technologies to improve and/or facilitate learning; assist in remedial learning strategies; cognitive enhancement	TBD	TBD	TBD	TBD	TBD
 Workplace Technologies to monitor or modify brain in the workplace; efficiency improvements, evaluation and monitoring	TBD	TBD	TBD	TBD	TBD
 Military/National Security Technologies to augment or improve the ability to fight or defend through soldier enhancement, intelligence, and/or debilitate the enemy	TBD	TBD	TBD	TBD	TBD
 Sports and Competitions Technologies impacting success in sports or competition, including before, during or after competition	TBD	TBD	TBD	TBD	TBD
 Entertainment Entertainment technologies, including virtual/augmented reality and brain-controlled video games	TBD	TBD	TBD	TBD	TBD
 Analytics, Marketing, & Advertising Technologies used to inform decision making, including data used to profile and influence consumers	TBD	TBD	TBD	TBD	TBD
 Justice System Technologies for use in civil and criminal adjudication, as well as in the correctional context, including to detect, modify and/or surveil brain states	TBD	TBD	TBD	TBD	TBD

APPLICATIONS / PURPOSE

IMPLICATIONS FOR

Education

**Stimulating/
Actuating**

Neuroscience and technology are being considered and used to optimize learning, memory, and performance of certain cognitive and behavioral tasks. This has led to ethical, legal and social concerns about how and when neuro-engineering should be used in educational settings.

Issues to consider include:

- » Unknowns stemming from use of frontier science and technology
- » Long-term effects of use in children/adolescents
- » Trade-offs of cognitive “gains” vs “losses”
- » Viability, validity and value of “informed” consent
- » Implicit or explicit coercion
- » Development of “super-scholars” and its limitations, vulnerabilities and liabilities
- » Establishment of a “new normal” of optimized cognitive performance
- » Issues/concerns surrounding “fairness”
- » Stigma/bias (for and/or against those receiving interventions)
- » Implications of “mind control”
- » Escalation and brinkmanship

Get Engaged » Help create the guidelines in your area of expertise

Complete online form to participate: tiny.cc/engageIEEEneuroethics



Humanitarian Activities
Committee

IEEE Humanitarian Activities Committee (HAC) and SIGHT: Health-Related Projects

Sampath Veeraraghavan, 2021 Global Chair, IEEE HAC

Holly Schneider Brown, Staff Lead, IEEE HAC

What is HAC?

HAC is a committee of IEEE that reports to the IEEE BoD

HAC provides leadership as well as a suite of resources that inspire and enable IEEE volunteers around the world to carry out and support impactful humanitarian technology and sustainable development activities at the local level.

HAC focuses on:

- Raising Awareness
- Providing Training
- Supporting and Evaluating Projects
- Connecting with the Greater Sustainable Development Community

HAC/SIGHT addresses a wide range of topics/issues, with health/well-being being one of them



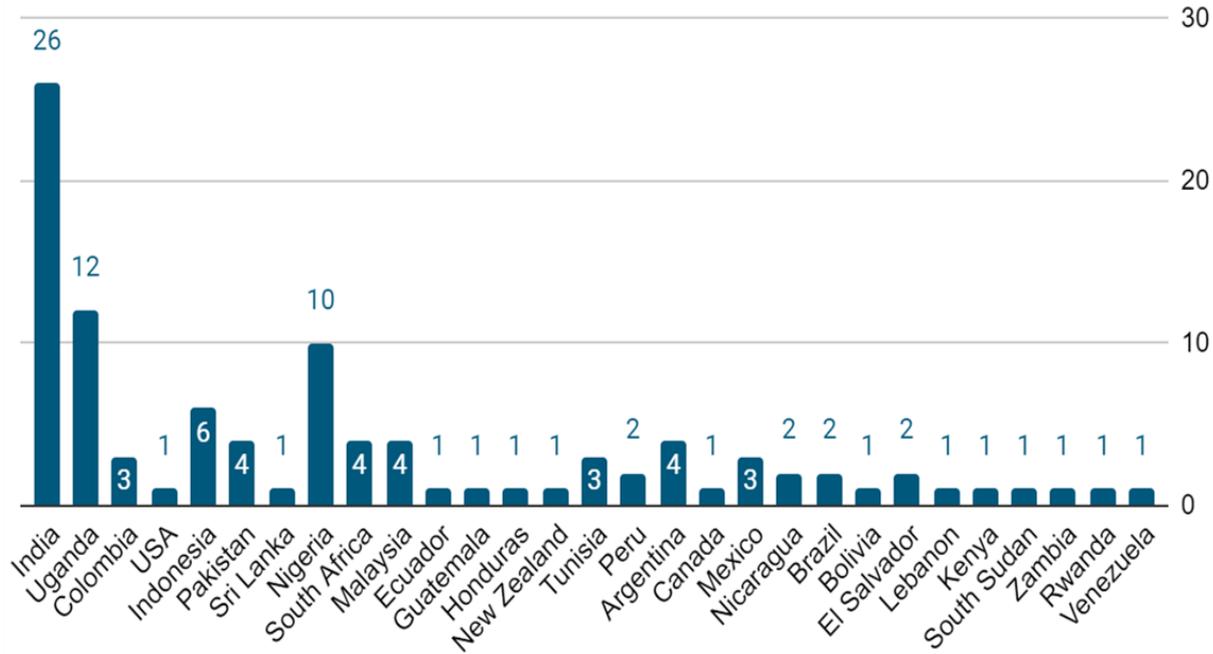
What is SIGHT?

SIGHT is a program and subcommittee of HAC

- SIGHT is a network of IEEE volunteers around the globe that partner with underserved communities and local organizations to leverage technology for sustainable development.
- **174 SIGHT groups in 54 countries.** Groups are most often found at the IEEE Section, Student Branch, or Society level.
- 11,000+ individual SIGHT members in 108 countries.



In 2020, 101 Approved Projects in 29 Countries

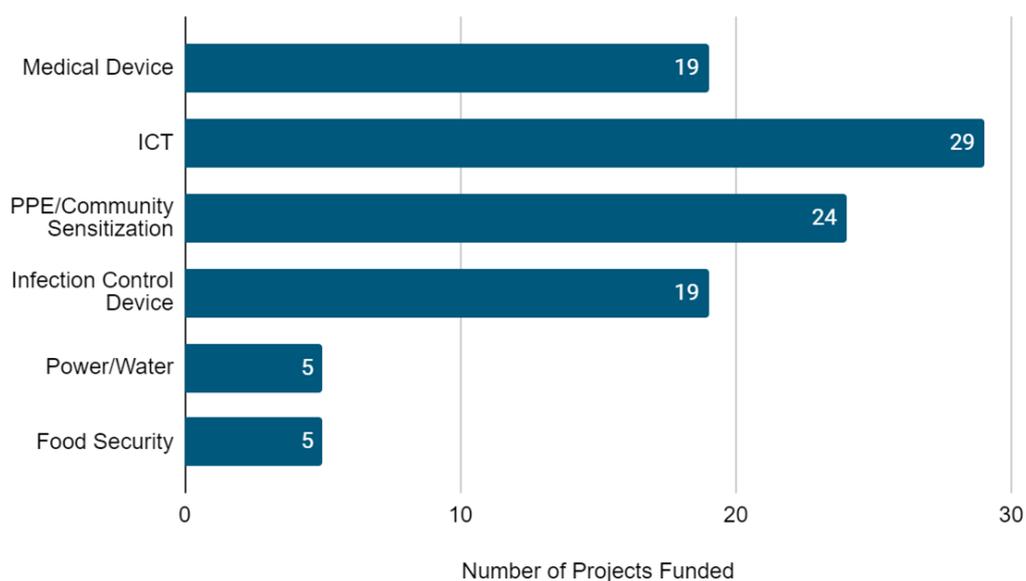


Count of Funded Projects by Country

Development of Communities of Practice (CoPs)

*Bringing together projects by thematic area to increase project impact, member engagement and professional development – **All CoPs are currently underway***

- Led by experienced IEEE volunteers
- Increase information sharing between related projects to speed learning curve
- Provide guidance and mentoring, when needed
- Develop and track common indicators
- Collect lessons learned to enable future replication and scaling



Empowering Women in Ajegunle Community

Empowering Women in Ajegunle Community



IEEE HAC/SIGHT COVID Project,
“Production of Locally Made Hand Sanitizers
and Health Awareness for Ajegunle Slum
in Lagos State, Nigeria”




Humanitarian Activities
Committee

- ▶ Location: Nigeria Section (R8)
- ▶ Funding Awarded: \$4,500
- ▶ Date Funded: 12 June 2020
- ▶ Brief Description: *The project provides material resources and knowledge to the women in the Ajegunle community to locally produce sanitizers for their use. This contributes to their hygiene while providing an income source as well. Health awareness discussions about life during and after the COVID-19 pandemic have also been a crucial element in this project. These discussions are done in their native dialect, and manuals are provided in all their languages. More than 500 women in the Ajegunle community are now equipped with this knowledge.*

Project Accolades

What we know so far!

2020 MGA Achievement Award Winner:

TEAM: Engineers Assisting Ventilator Maintenance project

Region 9 - Rio de Janeiro Section

“For engaging IEEE volunteers to work collaboratively with external institutions on a project that served the Rio de Janeiro area in fighting against COVID-19”

Project also featured in [The Institute](#).



What can you do?

- **Explore** the [list of funded projects](#) – updated regularly
- **Recommend** subject matter experts to be advisors on Communities of Practice
- **Publicize** projects relevant to your stakeholders – communications materials for funded projects coming soon
- **Identify** potential opportunities for partnership, additional funding, replication, and scaling
- **Let us know** if you have any questions, suggestions, or ideas



Humanitarian Activities
Committee

IEEE SIGHT

Special Interest Group on
Humanitarian Technology

Talk to us!

Reach out at hac-projects@ieee.org



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Stay Connected!

Where to find us:

- Visit HAC and SIGHT online — HAC.IEEE.org, SIGHT.IEEE.org
- Read [HAC Project Case Studies](#)
- [Become a SIGHT member](http://www.ieee.org/join-sight): www.ieee.org/join-sight
- [HAC Facebook](#) page and [SIGHT Facebook](#) page
- Join the SIGHT [Facebook group](#) and follow [ieeesight](#) on Instagram
- Questions? Contact: hac-office@ieee.org or sight@ieee.org

IEEE TechEthics[™]

*Exploring the
ethical and societal
implications
of technology*



Advancing technology for the benefit of humanity is the IEEE tagline. In order for technology to benefit humanity, it is essential to address ethical concerns and societal implications.

The IEEE TechEthics program offers a platform for discussion, conversation and debate of these issues via events, published content, educational modules, collaborations, and more.

JOIN THE EXPLORATION!

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Additional Health & Human Well-Being Resources

[IEEE Engineering in Medicine and Biology Society](#)

IEEE Engineering in Medicine and Biology Society (EMBS) is the world's largest international society of biomedical engineers. The organization's 12,000 members reside in some 97 countries around the world. EMBS provides its members with access to the people, practices, information, ideas and opinions that are shaping one of the fastest growing fields in science.

[IEEE Life Sciences](#)

The IEEE Life Science Technical Community (LSTC) fosters collaboration and communication among an array of IEEE Societies making contributions in the Life Sciences, to provide a broad-based home for IEEE members who are interested in some aspects of the life sciences. LSTC also seeks to create a virtual community for stakeholders that have interests in technology and its application in life sciences, including technology companies, hospitals, government organizations, pharmaceutical company researchers, and university researchers.

[Generation AI 2020: Health, Wellness and Technology in a Post-COVID World](#)

Generation AI 2020: Health, Wellness and Technology in a Post-COVID World is a global IEEE study that reveals the confidence Millennial parents with Generation Alpha children (under 11-years-old) in the U.S., U.K., India, China and Brazil may have in AI and emerging technologies for the health and wellness of their families.

[Join IEEE](#)

IEEE membership offers access to technical innovation, cutting-edge information, networking opportunities, and exclusive member benefits. Members support IEEE's mission to advance technology for humanity and the profession, while memberships build a platform to introduce careers in technology to students around the world.