

2021 IEEE Global Humanitarian Technology Conference (GHTC 2021)

**Virtual Conference
19-23 October 2021**



**IEEE Catalog Number: CFP21GHT-POD
ISBN: 978-1-6654-3373-0**

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IEEE Catalog Number:	CFP21GHT-POD
ISBN (Print-On-Demand):	978-1-6654-3373-0
ISBN (Online):	978-1-6654-3372-3
ISSN:	2377-6919

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10:40 Vehicle detection using YOLO and mobility tracking during COVID-19 pandemic lockdowns

Marion Ivan Tan, Clyde Calgo and Sheanne Eric Cabantac (Ateneo de Manila University, Philippines); Jaime Luis E Honrado (Ateneo de Manila University & Skyeye, Inc., Philippines); Nathaniel Libatique (Ateneo de Manila University, Philippines); Gregory Tangonan (Ateneo Innovation Center, Philippines)
pp. 1-7

11:00 Understanding COVID-19 Public Sentiment Towards Public Health Policies Using Social Media Data

Olivia Figueira, Yuka Hatori, Liying Liang, Christine Chye and Yuhong Liu (Santa Clara University, USA)
pp. 8-15

11:20 Evaluation of rule-based, CountVectorizer, and Word2Vec machine learning models for tweet analysis to improve disaster relief

Radhika Goyal (Lynbrook High School, USA)
pp. 16-19

11:40 Deploying Kalahok 1.0: Profiling Disaster-Stricken Communities Towards Intervention Initiatives

Joseph Marvin Imperial and Manolito Octaviano (National University, Philippines); Jesvir Zuniega (Bicol University, Philippines); Angelica De La Cruz and Rachel Edita Roxas (National University, Philippines)
pp. 20-23

WE-EN1: Energy 1: Off-Grid Electrification

Room: track3

Chair: Henry Louie (Seattle University, USA)

10:40 SESDC Pre-Feasibility Toolkit Economic Validation For Microgrids In Developing Countries

Robert Nutter (IEEE PES SES DC Working Group, USA); Jaspreet Singh (IEEE PES, USA); Peter Dauenhauer (University of Strathclyde & Snohomish County PUD, USA)

11:00 A Rural Microgrid Field Pilot in India Ensuring Reliable Electricity Supply and Social Upliftment

Shiv Kumar Singh (Indian Institute of Technology, Kanpur, India); Ankush Sharma (Indian Institute of Technology Kanpur, India); Santanu Mishra (Indian Institute of Technology, Kanpur, India); Suresh Chandra Srivastava (Indian Institute of Technology Kanpur, India); Deep Mukherjee (IIT Kanpur, India); Anurag. K Srivastava (West Virginia University, USA); Noel Schulz (Washington State University, USA)
pp. 24-27

11:20 An Approach Towards a Sustainable Urban City - Utilization of Existing Rooftop Solar Energy Panels by Making Use of DC Appliances

Ashir Hamim Rifat and Muckbul Hossain (Brac University, Bangladesh); Rifatul Islam Abir and Shoud Noman (BRAC University, Bangladesh); Tahmidul Ashraf and A. K. M Abdul Azad (Brac University, Bangladesh)
pp. 28-32

11:40 Energy-Efficient Programming Languages for Mobile Applications

Shashikala Mahadevappa and Silvia Figueira (Santa Clara University, USA)

pp. 33-38

WE-H1: Healthcare 1: Healthcare Applications Supporting Visual Impairments

Room: track1

Chair: Miriam Cunningham (IIMC / IST-Africa, Ireland)

10:40 Application for Measuring Eyelid Weakness in Individuals with Myasthenia Gravis

Shixin Qin, Germaine Y Ng, Hua Lo, Yanzhang Li and Ami Cuneo (University of Washington, USA); Matthew Preston (UW Medicine, USA); Nicholas Ames and John Raiti (University of Washington, USA)

pp. 39-42

11:00 Inexpensive Voice Assisted Smart Eyewear for Visually Impaired Persons in Context of Bangladesh

Md. Mahmudul Kabir Peyal, Quazi Md. Ahnaf UI Haque and Tashfia Tahiat (Brac University, Bangladesh); Sadia Habib (BRAC University, Bangladesh); Al Noor and A. K. M Abdul Azad (Brac University, Bangladesh)

pp. 43-50

11:20 Wearable Device Using Depth Sensor for the Visually Impaired

Sophia L Zhou, Jon Cili, Jay Nagpaul and Rutvik Parikh (Worcester Polytechnic Institute, USA)

11:40 Effatá: Obstacle Identification System to help the Blind in Urban Displacement

Lukas Bergengruen, Diego Duran and Rafael Sotelo (Universidad de Montevideo, Uruguay)

pp. 51-54

Wednesday, October 20 12:00 - 13:00 (America/
Los_Angeles)

WE-LB: Lunch Break & Networking Session

Room: Plenary

Wednesday, October 20 13:00 - 13:50 (America/
Los_Angeles)

WE-P3: Plenary Panel: Social Media Disinformation and its Impact on Public Health During the COVID-19 Pandemic

Room: Plenary

14:40 Network Hazard Flow for Multi-Tiered Discriminator Analysis Enhancement with Systems-Theoretic Process Analysis

Acklyn Murray and Danda B. Rawat (Howard University, USA)

pp. 55-61

15:00 Fixing Mobile Emergency Call Geo-Location Once and For All

Ghassan Al-Nuaimi (Flinders University, Australia); Matthew Lloyd (New Zealand Red Cross, New Zealand); Saeed Ur Rehman and Paul Gardner-Stephen (Flinders University, Australia)

pp. 62-67

15:20 NetSkylines: Digital Twins for Evaluating Disaster Communication

Tobias Meuser (Technical University of Darmstadt, Germany); Lars Baumgärtner (Technische Universität Darmstadt, Germany); Benjamin Becker (Technical University of Darmstadt, Germany)

pp. 68-71

15:40 Designing a LoRa-based Smart Helmet to Aid in Emergency Detection by Monitoring Biosignals

Marcus Choi, Guanting Li, Ross Todrzak, Qian Zhao and John Raiti (University of Washington, USA); Paul B Albee (Vulcan Inc., USA)

pp. 72-75

WE-EN2: Energy 2: Sustainable Grid Technologies

Room: track3

Chair: Henry Louie (Seattle University, USA)

14:40 DeLorean Energy: The potential of Asynchronous V2G Fleets as Peak Shaving Units

Jordan Randleman, Chris Pitterle, Pranav Rao, Arjun Chimni and Navid Shaghaghi (Santa Clara University, USA)

pp. 76-85

15:00 A New Approach to Developing Community Solar Projects for LMI Communities in ERCOT's Competitive Electricity Markets

Tam Kemabonta (Arizona State University, USA); Erick Jones (University of Texas at Arlington, USA); Dana Harmon (Texas Energy Poverty Research Institute, USA); Jason Pittman (Big Sun Solar, USA)

pp. 86-93

15:20 Investigation of the Electric Power System for San Cristobal Island in the Galapagos Archipelago

Nicole E Fronsdaahl and Pritpal Singh (Villanova University, USA)

pp. 94-100

15:40 Condition Monitoring of Electric Vehicle Drives deployed in Rural Electric Transportation

Adil Usman (University of California Santa Cruz, USA); Bharat Singh Rajpurohit (IIT Mandi, India); Muhammad Safeer Khan (Arkansas Tech University, USA); Michael Akbar (Numerica Solutions, India)

pp. 101-107

Wednesday, October 20 14:40 - 16:30 (America/

Los_Angeles)

WE-H2: Healthcare 2: Medical Technology

Room: track1

Chair: Miriam Cunningham (IIMC / IST-Africa, Ireland)

14:40 *Demonstration of a low-cost EEG system providing on-demand communication for locked-in patients*

Dongho Koo and Hernan Felipe Herrera Polanco (University of Washington, USA); Michael C Cross (University of Washington, USA & Tsinghua University, China); Yeon Hee Rho, Nicholas Ames and John Raiti (University of Washington, USA)

pp. 108-111

15:00 *A Low-cost, Automated, Portable Mechanical Ventilator for Developing World**

Saad Pasha (Ujala Technologies, Pakistan); Eesha Tur Razia Babar (UET & None, Pakistan); Jack Schneider, John Heithaus and Muhammad Mujeeb-U-Rahman (Ujala Technologies, USA)

pp. 112-118

15:20 *Improving the Use of Surgical Suction Pumps in Sierra Leone*

Asja Mucha (TU Delft, The Netherlands); Jan Henk Dubbink (Masanga Hospital, Sierra Leone); Stefan Persaud and Adithyan Senthil Athiban (TU Delft, The Netherlands); Jan-Carel Diehl (Delft University of Technology, The Netherlands)

pp. 119-126

15:40 *Heart Lung Health Monitor: Remote At-Home Patient Surveillance for Pandemic Management*

Shereena Shaji (Amrita University, India); Rahul Krishnan Pathinarupothi (Amrita Vishwa Vidyapeetham, India); Ekanath Rangan (Amrita University, India); K. A. Unnikrishna Menon (Amrita Vishwa Vidyapeetham, India); Maneesha Ramesh (Amrita University, India)

pp. 127-130

16:00 *Clinical investigation as an iteration tool for the design of low-risk medical devices: A case study of an IV drip monitoring system*

Kavyashree Venkatesh, Deval Karia and Manish Arora (Indian Institute of Science, India)

pp. 131-137

Wednesday, October 20 16:30 - 17:00 (America/
Los_Angeles)

WE-NS: Networking Session: Agriculture, Healthcare, Education, Connectivity, Energy, Water

Room: Plenary

10:40 Ecosystem approach to sustainable aquaculture for smallholder farmers

Nataraj Kuntagod (Accenture, India); Sanjay Podder, [Rambhau Rote](#) and Satya Sai Srinivas (Accenture Solutions Pvt Ltd, India); Neelkanth Mishra and Ayush Chopra (Center for Aquatic Livelihood Jaljeevika, India)
pp. 138-141

11:00 AI-Based Crop Rotation for Sustainable Agriculture Worldwide

[Julius Schöning](#) (Osnabrück University of Applied Sciences, Germany); Mats Richter (Osnabrück University, Germany)
pp. 142-146

11:20 Optimal Deployment Planning to Maximize Coverage of Agricultural Operations with Effective Resource Utilization

[Swagatam Bose Choudhury](#) (Tata Consultancy Services Limited, India); Sanat Sarangi and Srinivasu Pappula (Tata Consultancy Services, India)
pp. 147-154

11:40 Digital Display Recognition towards Connected Sensing Systems for Precision Agriculture

Sanket Junagade, [Prachin Jain](#), Sanat Sarangi and Srinivasu Pappula (Tata Consultancy Services, India)
pp. 155-162

TH-ED1: Education 1: Online Service Learning

Room: track3

Chair: Pritpal Singh (Villanova University, USA)

10:40 Global STEM Education through e-Service Learning in the Time of COVID-19: A Case Study

Grace Ngai, [Kenneth Wai Kwan Lo](#), Stephen Chi Fai Chan and Shuheng Lin (The Hong Kong Polytechnic University, Hong Kong)
pp. 163-168

11:00 Reconceptualizing Online Experiential Learning: Case Study of a Tele-engineering Project

[Shuheng Lin](#), Kenneth Wai Kwan Lo, Grace Ngai, Stephen Chi Fai Chan, Artemis Mei Ling Kuo and Anson Chun Wong (The Hong Kong Polytechnic University, Hong Kong)
pp. 169-172

11:20 Upgrading the Digital Intranet in the Galapagos Islands

[Javier Urquizo](#), Olivia Lajeunesse, Paige Bonvallet and Michael Carrigan (Villanova University, USA); Nathaly Simuy Sanchez Chan (Chalmers University of Technology, Sweden); [Pritpal Singh](#) (Villanova University, USA); David Lansdale (Beyond Chacay Foundation & USFQ, Ecuador); Cesar Martin (Escuela Superior Politécnica del Litoral, Ecuador)
pp. 173-180

11:40 The Impact of the Deaf Community on Student Learning in a Service-learning Study Abroad Experience

[Nusaybah Abu-Mulaweh](#) and William Oakes (Purdue University, USA)
pp. 181-187

TH-H3: Healthcare 3: Supporting Stakeholder Engagement

Room: track2

Chair: Miriam Cunningham (IIMC / IST-Africa, Ireland)

10:40 Peer and Non-Peer Academic Scientists and Peer Support Specialist Community of Practice: Stakeholder Engagement to Advance the Science of Peer Support

Karen Fortuna (Dartmouth College, USA); Mbita Mbao (Simmons University, USA); Arya Kadakia (Dartmouth College, USA); Amanda Myers (Rivier University, USA); Daniel Fischer (National Empowerment Center, USA); Sandi Macdonald (International Association of Pre-Menstrual Disorders, Canada); Sheila Brunchet (International Association of Pre-Menstrual Disorders, Canada); Iga Hintz (National Empowerment Center, Poland); Rebecca Rossom (HealthPartners Institute, USA); Jessica Brooks (University of Wisconsin-Madison, USA); Joseph Kalisa (University of Rwanda, Rwanda); Claver Haragirimana (Opromamer, Rwanda); Marianne Storm (University of Stavanger, Norway & Molde University College, Norway); George Mois (University of Georgia, USA); Emre Umucu (University of Texas at El Paso, USA); Margaret Almeida (Harvard University, USA & The Mental Health Cntr of Greater Manchester, USA); Jennifer Rivera (Boston College, USA); Yaara Zisman Ilani (Temple University, USA); Maria Venegas (Veterans Affairs, USA); Robert Walker (Department of Mental Health, USA)

pp. 188-194

11:00 Stakeholders' Perspectives on Partnering to Inform the Software Development Lifecycle of Smartphone Applications for People with Serious Mental Illness

Marianne Storm (University of Stavanger, Norway & Molde University College, Norway); Amanda Myers (Heller School for Social Policy and Management at Brandeis University); Maria Venegas (Veterans Affairs, USA); Jessica Brooks (University of Wisconsin-Madison, USA); Alyssa Gocinski (Boston College, School of Social Work, USA); Karen Fortuna (Dartmouth College, USA)

pp. 195-199

11:20 Designing an interactive real-time web-mapped dashboard to visualise conflict ceasefires data over COVID-19 infection rates: facilities and the way ahead

Devanjan Bhattacharya, Sanja Badanjak, Christine Bell, Fiona Knäussel, Laura Wise, John Allison and Benjamin Bach (University of Edinburgh, United Kingdom (Great Britain))

pp. 200-207

Thursday, October 21 12:00 - 13:00 (America/Los_Angeles)

TH-LB: Lunch Break & Networking Session

Room: Plenary

Thursday, October 21 13:00 - 13:50 (America/Los_Angeles)

TH-P3: Plenary Panel: Tech Innovations for Healthy Aging

Room: Plenary

15:00 *Lessons learnt from deploying an IoT sensing system for e-Agriculture in South Africa*

Yemisi Oyedele and Phumla Dlamini (Nelson Mandela University, South Africa); [Darelle Van Greunen](#) (Nelson Mandela University, Ireland); Tinashe R Chizema (Centre for Community Technologies & Tinashe Chizema, South Africa)

pp. 208-212

15:20 *Towards Building a Data-Driven Framework for Climate Neutral Smart Dairy Farming Practices*

[Mohit Taneja](#) (Walton Institute of Information and Communication Systems Science & Telecommunications Software and Systems Group, Ireland); Nikita Jalodia (Waterford Institute of Technology & Walton Institute for Information and Communication Systems Science, Ireland); Behnam Dezfouli (Santa Clara University, USA)

pp. 213-218

15:40 *Innovating Solar Charging Kiosks for Shambatek's Agricultural Business in Kenya*

Dane Nicklaus (Penn State University, USA); [John Gershenson](#) (The Pennsylvania State University, USA)

pp. 219-224

16:00 *GrapeSense: A Grape Aging Classifier Using Residual Transfer Learning On Drone Images*

[Maanit Sharma](#) (St. Ignatius College Preparatory, USA); Navid Shaghaghi (Santa Clara University, USA)

pp. 225-228

TH-DM3: Disaster Mitigation 3: Aerial Monitoring System for disaster response and recovery

Room: track2

Chair: Adil Usman (University of California Santa Cruz, USA)

15:00 *UAV 3D-Draping System for Sharing Situational Awareness from Aerial Imagery Data*

[Toru Yamanouchi](#) (LLC. Spatial Architects, Japan); Go Urakawa (University of Hyogo, Japan); Shigeru Kashihara (Osaka Institute of Technology, Japan)

pp. 229-232

15:20 *Calling Ground Support: Cooperative DTNs for Improved Aerial Monitoring Systems*

[Julian Zobel](#) and Tobias Meuser (Technical University of Darmstadt, Germany); Ralf Steinmetz (Technische Universität Darmstadt, Germany)

pp. 233-240

TH-ED2: Education 2: Professional Preparation of Social Entrepreneurs

Room: track3

Chair: Pritpal Singh (Villanova University, USA)

15:00 Academic Social Entrepreneurship in Higher Education and its Impact on Students Entering the Workforce

Erica Blaze, Nicole Cingolani, Adira Nair and Nicholas Vescera (Penn State University, USA); John Gershenson (The Pennsylvania State University, USA)
pp. 241-246

15:20 Recent Advances in Socially Relevant Computing: Status and Perspectives

Acklyn Murray and Danda B. Rawat (Howard University, USA)
pp. 247-252

15:40 Humanitarian Technologists as Prototypical V-Shaped Professionals

Daniel B Oerther (Missouri University of Science and Technology, USA)
pp. 253-257

16:00 Attributes Based Ranking and Selection of Vending Carts using Fuzzy TOPSIS

Suraj Bhat (Indian Institute of Technology, India); Subir Saha (Indian Institute of Technology Delhi, India); Vinay Gupta (IEC College of Engineering, India)
pp. 258-264

Thursday, October 21 16:30 - 17:00 (America/Los_Angeles)

TH-NS: Networking Session: Agriculture, Healthcare, Education, Connectivity, Energy, Water

Room: Plenary

Friday, October 22

Friday, October 22 9:00 - 9:40 (America/Los_Angeles)

FR-P1: Plenary Presentation: Hearing Aids and Internet-of-Things Ecosystem

Dr. Octav Chipara, The University of Iowa

Room: Plenary

Over the last decade, researchers have successfully improved the performance of hearing aids by leveraging the increasing capabilities of hardware platforms, which enabled sophisticated signal processing algorithms. In contrast, I expect that further improvements will not be driven primarily by better hardware but rather by the integration of hearing aids into the Internet of Things (IoT) ecosystem. The IoT ecosystem is composed of resource-constrained devices such as phones, smart glasses, or Internet-enabled doorbells. As an example of this trend, I present two benefits of integrating smartphones and hearing aids. First, I will discuss how smartphones helped improve our understanding of the performance of hearing aids in the real world. Next, I will explain how smartphones can help better personalize hearing aids to meet a user's individual hearing needs. Finally, I will conclude with a vision of hearing aids in which they are tightly integrated into the IoT ecosystem.

Friday, October 22 9:45 - 10:30 (America/Los_Angeles)

FR-P2: Plenary Presentation: Innovations and challenges in developing Medical Devices

Dr. Farid Farahmand, Sonoma State University

Room: Plenary

In this brief talk we explore the building blocks and applications of the Internet of Medical Things (IoMT). We talk about technical challenges of developing IoMT and its tremendous value for patient care. We also briefly examine the logistical hurdle in developing novel medical devices, including navigating FDA regulations.

Friday, October 22 10:30 - 10:40 (America/Los_Angeles)

FR-B2: Break

Room: Plenary

Friday, October 22 10:40 - 12:00 (America/Los_Angeles)

FR-AG3: Agriculture 3: Technology Adoption in Agriculture

Room: track1

Chair: Paul M Cunningham (IIMC / mHealth4Afrika / IST-Africa Institute, Ireland)

10:40 Offloading an Energy Efficient IoT Solution to the Edge: A practical Solution for Developing Countries

Gibson Kimutai (University of Rwanda & Moi University, Rwanda); Alexander Ngenzi (Jain University, Rwanda); Said Ngoga (University of Rwanda, Rwanda); Anna Förster (ComNets, University of Bremen, Germany)

pp. 265-272

11:00 Optimization of Generational Grain Spawn and Mushroom Production In Tropical Environments

Asgar Ali, David Tauman, Belle Sullivan and Khanjan Mehta (Lehigh University, USA)

pp. 273-280

11:20 Data to Donations: Towards In-Kind Food Donation Prediction across Two Coasts

Esha Sharma (North Carolina State University, USA); Lauren Davis (North Carolina A&T State University, USA); Julie Ivy and Min Chi (North Carolina State University, USA)

pp. 281-288

11:40 Ground Clutter Mitigation and Insect Signature Detection for Polarimetric C-Band Doppler Weather Radar

Maniraguha Fidele (African Center of Excellence in IoT, University of Rwanda, Rwanda & Rwanda Meteorology Agency, Rwanda); Anthony Vodacek (Rochester Institute of Technology, USA); Emmanuel Ndashimye (Carnegie Mellon University Africa & University of Rwanda, Rwanda); Gerard Rushingabigwi (African Center of Excellence in IoT, University of Rwanda, Rwanda)

pp. 289-296

FR-CM: Communications based Applications and Issues

Room: track2

Chair: Yuhong Liu (Santa Clara University, USA)

10:40 *Escaping the Dead Zone: a Bottleneck in Humanitarian Ionospheric Radio Communications*

Ben A. Witvliet (University of Twente, The Netherlands)

pp. 297-303

11:00 *coreemu-lab: An Automated Network Emulation and Evaluation Environment*

Lars Baumgärtner (Technische Universität Darmstadt, Germany); Tobias Meuser (Technical University of Darmstadt, Germany); Bastian Bloessl (TU Darmstadt, Germany)

pp. 304-311

11:20 *Is Social Diversity Related to Misinformation Resistance? An Empirical Study on Social Communities*

I Chang, Orion Sun, Jasper Ahn and Yuhong Liu (Santa Clara University, USA)

pp. 312-318

11:40 *Model for Humanitarian-Centered Technology for Micro, Small, Medium Enterprises (MSME), United Nations SDGs 8 & 10*

LaVonne Reimer (Descant Labs, USA)

FR-EN3: Energy 3: Human-Centered Design of Energy Applications

Room: track3

Chair: Henry Louie (Seattle University, USA)

10:40 *Kashmiri Hamam: An Exploration of Technical Design Within Traditional Architecture and Culture*

Sabahat Sakinah and Mahshida Hamid (Islamic University of Science and Technology, India); Paarth Chopra (University of California- Berkeley, USA); Afshan Anjum Baba (Sher-e-Kashmir University of Agricultural Sciences and Technology of Kashmir & India, India); Asad H. Sahir (Indian Institute of Technology Ropar, India); Daniel Sweeney (Massachusetts Institute of Technology, USA)

pp. 319-326

11:00 *A theory of change for cleaner cooking: building a health belief model for service design starting with the slums of Kathmandu*

Brita Fladvad Nielsen (Norwegian University of Science and Technology, Norway); Paras Khanal (NTNU, Norway)

pp. 327-330

11:20 *Analysis of Agricultural Waste Briquettes as a Sustainable Charcoal Substitute in Kenyan Markets*

Xiaochen Yuan (Penn State University, USA); John Gershenson (The Pennsylvania State University, USA)

pp. 331-337

11:40 *Micro-controllers, Sunlight, and Educators from Two Continents: The Genesis of Mutually*

Beneficial Techno-cultural Relations

Geraldine Light (Walden University, USA); Jorge Santiago-Aviles and Aavo I Reinvald (University of Pennsylvania, USA); Meredith J Bolen (Energy Institute High School, USA); Tashweena Heeramun (University of Pennsylvania, USA); Promise O Adebayo-Ige (University of Tennessee, Knoxville, USA); Erin Brown (University of Pennsylvania, USA)

pp. 338-341

Friday, October 22 12:00 - 13:00 (America/Los_Angeles)

FR-LB: Lunch Break & Networking Session

Room: Plenary

Friday, October 22 13:00 - 14:00 (America/Los_Angeles)

FR-P3: Plenary Panel: Think Global, Act Local: Fostering Engineering Knowledge and Capacity for Impact

Room: Plenary

Moderator: Iana Aranda, Director, Engineering Global Development, ASME and President, Engineering for Change

Panelists:

- Nishant Agarwal, Founder & CEO, Life and Limb (P) Ltd., (India)
- Abdul Rashid Mussah, Graduate Assistant at the University of Missouri-Columbia (USA)
- Valentina Ospira, Architect (Colombia)
- Brandon Simmons, Graduate Assistant at Villanova University (USA)

Friday, October 22 14:10 - 15:00 (America/Los_Angeles)

FR-P4: Plenary Presentation: Federal Policies, Programs and Funding Opportunities on Humanitarian Engineering

Aline McNaull, Senior Legislative Representative, IEEE-USA

Room: Plenary

The federal government organizes many programs, through the Department of State, USAID and other research agencies, that support humanitarian engineering projects. This talk will provide an overview of these programs and funding opportunities and will offer a brief overview of how IEEE-USA is working with these agencies to ensure that the United States can address humanitarian needs in a manner that is sustainable and technology-based. From ensuring the sustainability of our oceans to collaborating with developing nations on remote sensing and environmental monitoring, IEEE-USA members have been at the forefront of developing technological solutions to global challenges. Ensuring refugees access to electric grids and that they have access to clean water are just some of the many issues that IEEE engineers address through humanitarian programs. Lastly, this talk will provide a summary of how IEEE-USA can be helpful in working with the federal government, Congress and the administration to ensure robust support for the federal programs that support technical work in humanitarian fields.

Friday, October 22 15:10 - 16:20 (America/Los_Angeles)

FR-ED3: Education 3

Room: track1

Chair: Pritpal Singh (Villanova University, USA)

15:10 *An English to Punjabi Educational Video Translation Pipeline for Supporting Punjabi Mother-Tongue Education*

Navid Shaghaghi, [Smita Ghosh](#) and [Raghav Kapoor](#) (Santa Clara University, USA)
pp. 342-348

15:30 *Automating Translation of Educational Material to Promote Global Education*

Devesh Katta, Revanth Thantepudi, Hannah Kareti, Vedy Konda, Mahalakshmi Nagulapati, Maria Joseph Israel and Navid Shaghaghi (Santa Clara University, USA)

15:50 *Investigating the Economic Feasibility of Community-Scale Plastic Recycling Facilities*

Susan H Cheng, Laura E. Marsiglio, Kelly M Mulvaney, Brian C Slocum, Donald Morris, Ganesh Balasubramanian and [Khanjan Mehta](#) (Lehigh University, USA)
pp. 349-355

FR-EN4: Energy 4: Energy Conversion and Storage for Humanitarian Applications

Room: track3

Chair: Henry Louie (Seattle University, USA)

15:10 *Fuzzy Logic Based MPT Algorithm for Reconfigurable Photovoltaics*

[Rakeshkumar Mahto](#), Nate Ruppert, Aaron Nguyen and Gaurav Kalotra (California State University, Fullerton, USA)
pp. 356-359

15:30 *A Prototype Small Utility-Scale Joint Vertical Axis Wind Turbine and Solar Energy System (VAWT/SES) to Provide Water Pumping in Remote Areas of Uganda*

Jacquelyne Hernandez (Energy Storage Technologies, USA); Samuel J Roberts-Baca (University of Denver & Sandia National Laboratories, USA); [Gabriel Gurule](#) (Sandia National Laboratories, USA)
pp. 360-367

15:50 *Design and ideation workshop for ejector-based refrigeration system with disaster relief applications*

[Kartik V Bulusu](#) (The George Washington University, USA)
pp. 368-370

FR-WS: Water and Sanitation Applications and Issues

Room: track2

Chair: Yuhong Liu (Santa Clara University, USA)

15:10 Guidelines for the design of digital knowledge: Empowering Bangladeshi communities to improve their water safety

Nayantara Thomas (TU Delft, The Netherlands); Annemarie Mink (Delft University of Technology, The Netherlands); Abhigyan Singh (TU Delft, The Netherlands); Bilqis Amin Hoque (EPRC, The Netherlands); Doris Van Halem (TU Delft, The Netherlands); [Jan-Carel Diehl](#) (Delft University of Technology, The Netherlands)

pp. 371-378

15:30 Mobile Application to Distribute Water Quality and Weather Information in Rural Nicaragua

[Angela Musurlian](#), Allan Morales, Rachael Freitag, Alexa Grau, Justin Ling, Sarah Ortiz-Jones and Greta Seitz (Santa Clara University, USA)

pp. 379-383

15:50 Design and development of Air to Water Generator for the Village in Kerala, India

Harish P, Sayee R, Pranesh S and Sumedh Degaonkar (Amrita Vishwa Vidyapeetham, India); Sara Kaya and Omar Kiwan (Saxion University of Applied Sciences, The Netherlands); [Renjith Mohan](#) and Sowndaram C S (Amrita Vishwa Vidyapeetham, India)

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Friday, October 22 16:30 - 17:00 (America/Los_Angeles)

FR-CL: Closing Session and Best Papers Awards

Room: Plenary

Closing remarks; Best Paper Award; Poster Competition winners announced. GHTC 2022 Introduction.