IEEE GHTC 2022
September 8 - 11, 2022
Santa Clara University, California, USA

12th IEEE Global Humanitarian Technology Conference
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Welcomes

Welcome from the Chair

I welcome you to the 2022 IEEE Global Humanitarian Technology Conference (GHTC). GHTC has become a flagship annual venue for academics, for-profit and non-profit businesses, and governmental and non-governmental organizations to identify the present and future humanitarian needs and demonstrate their work to create influential, novel, and accessible humanitarian technologies. GHTC is an excellent opportunity to network, share, learn, and establish collaborations to build innovative and accessible humanitarian technologies.

This year's event is held in a hybrid fashion. All the keynotes, plenaries, panels, special sessions, workshops, contests, and demos are held in person with live broadcasts to enhance the engagement of attendees. Authors are provided with the opportunity to present their work in person or remotely.

The conference's mission is to:

- Foster the exchange of information, networking, and cooperation in Sustainable Development, Humanitarian Technology, Information and Communication Technologies for Development (ICT4D), and Disaster Recovery spaces.
- Focus attention on organizations that enable or leverage technologies and engineering expertise in support of Sustainable Development and the UN's Sustainable Development Goals (SDGs)
- Provide a forum where practitioners can share solutions or identify solutions or potential partners when addressing specific societal challenges
- Impact in positive and meaningful ways the lives of disadvantaged billions of people around the world
- Attract young people to these professional fields by exploring Science, Engineering, Technology, and Math (STEM) solutions to addressing the world's vulnerable communities

The Technical Program Committee has prepared an excellent program featuring over 80 technical paper presentations on the latest developments and deployments related to the United Nation's Sustainable Development Goals (SDGs). The topics of the technical sessions are good health and well-being, connectivity and communication in support of development, agriculture and food security, affordable and clean energy, quality education, decent work and economic growth, and disaster mitigation, preparedness, response and recovery.

The conference program includes keynote and plenary presentations by professionals from academia, industry, and non-profit organizations. Our speakers are Neha Kumar (Associate Professor, Georgia Tech), Janice Zdankus, (Vice President, CTO Technology Strategy and Innovation for Social Impact, HPE), Tim Lee (Director, IEEE Region 6), Puneet Sharma (Distinguished Technologist, Hewlett Packard Labs), Kithinji Muriungi and Chris Murimi (Moi University Nairobi, Kenya), Stephanie Gillespie (Chair, EPICS in IEEE Committee), Vishnu S. Pendyala (Professor, San Jose State University), Maya Ackerman (Assistant Professor, Santa Clara University), Eric Goldman (Professor, Santa Clara University), Kelly Yamanishi and Eric Hess (Maker Nexus, USA) Paul Shmotolokha (New Use Energy), and Aline D. McNaull (IEEE-USA).
The conference program also includes several panel discussions and special sessions with the following titles: "Diversity in the Workplace: Retaining Early Career Women and Minority Engineers," "Quality Education Online and the Way Forward," "Communications, Computing, and Power during Disaster Response," "Advancing DEI in Journalism with Tech: Opportunities and Guardrails," "Web3 and Human Rights," and "HAC Capacity Building" with Sampathkumar Veeraraghavan, Chair, IEEE Humanitarian Activities Committee.

The first day of the conference features three half-day workshops and student poster competition. The workshops are: "Machine Learning for Social Good," "Building Wireless Sensing Systems," and "GHTC and IEEE Consulting Network Synergies." Professionals from industry and academia will be running these workshops.

I want to thank:

- the authors for submitting their influential papers,
- the Technical Program Committee and track chairs for their excellent job of reviewing the papers and preparing the scientific program,
- speakers and panelists for accepting our invitation to participate and present at this venue,
- the publication team for preparing the conference proceedings, and
- the program team and steering committee for their sustained support and orchestrating this year's events.

Please join us from September 8 through 11 at Santa Clara University.

Dr. Behnam Dezfooli
General Chair, 2022 GHTC
Welcome from the Technical Program Chair

Welcome to the 12th Annual IEEE Global Humanitarian Technology Conference (GHTC) in Santa Clara, CA. GHTC 2022 promises to be an exciting conference, held in person for the first time in three years. GHTC addresses the need to bring together researchers and developers to share practical technology-enabled solutions that address the needs of underserved populations worldwide. Critically, topics within the conference address many of the United Nations Sustainable Development Goals (SDGs) to advance the state of the art and positively impact successful humanitarian technology implementation. Particularly noteworthy is the new track this year on SDG5, technologies that promote gender equality and the empowerment of women and girls.

The response to the call for papers was very positive. We received a total of 118 submissions of full papers, short papers, and oral-only presentations that represent earlier stage projects. 84 of the original submissions have been accepted, resulting in an array of exciting presentations that broadly cover the 11 thematic areas of the conference. These presentations are spread across 27 technical sessions and are complemented by an array of keynotes, plenary presentations and panel discussions on a variety of topics.

We are very thankful to all the Track Chairs and paper reviewers for their thoughtful evaluations of the submissions. The dedicated help and hard work of these individuals helped us to put together a strong technical program for the conference. In addition to the TPC, we would in also like to thank the Chair, Behnam Dezfooli, and the Vice-Chair of Operations, Ed Perkins, for their invaluable leadership during the planning of the conference. Finally, we would also like to thank the Organizing Committee and Steering Committee members for their critical contributions in making this conference a success.

We welcome you to Santa Clara, CA, (or to the GHTC virtual world, if you are an online participant) and hope that you will enjoy the conference program and the technical discussions with other researchers and practitioners. We also look forward to your continued participation in future GHTC conferences.

Elizabeth M. Belding
IEEE GHTC 2022 Technical Program Committee Chair
**Conference Committees**

**GHTC 2022 Organizing Committee**

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<thead>
<tr>
<th>Position</th>
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<tr>
<td>Chair</td>
<td>Behnam Dezfooli</td>
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<td>Vice-Chair</td>
<td>Yuhong Liu</td>
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<td>Vice-Chair Operations</td>
<td>Ed Perkins</td>
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<td>Khanjan Mehta</td>
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<td>Technical Program Chair</td>
<td>Elizabeth Belding</td>
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<td>Plenary/Keynote/Panels</td>
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<td>Tutorials/Workshops</td>
<td>Behnam Dezfooli</td>
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<td>Vice Chairs 2023</td>
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<td>Toby Cumberbatch</td>
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<td>Joseph Wei</td>
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<td>Mike Brisbois</td>
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<td>Erik Godo</td>
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<td>Erik Godo</td>
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<td>Student Posters Chair</td>
<td>Mostafa Mortezaie</td>
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<td>R6 Humanitarian Chair</td>
<td>Nirupama Prakash Kumar</td>
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<td>IEEE SSIT Jay Pearlman</td>
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<td>IEEE-USA Scott Tamashiro</td>
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<td>IEEE-SA Rudi Schubert</td>
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**GHTC Advisory Committee**

Advisor, R6 Conferences Chair Charlie Jackson
Advisor, R6 Mike Andrews
Advisor, R6 Past-Director Keith Moore
Advisor, R6 Director Tim Lee
COMMITTEES

Advisor, R6 Director-elect Kathy Herring Hayashi
Advisor Daniel Lottis
Advisor Ed Aoki
Advisor Ed Perkins
Advisor Lewis Terman

Program Committee

TPC Chairs
Technical Program Chair Elizabeth Belding
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Tutorials/Workshops Behnam Dezfooli
Vice Chairs 2023 John Gershenson
Toby Cumberbatch

Track Chairs
Affordable & Clean Energy Toby Cumberbatch, Cooper Union
Agriculture & Food Security Adil Usman, UCSC,
Clean Water & Sanitation Laura Doyle, SCU
Connectivity & Communication in Support of Morgan Vigil-Hayes, Northern Arizona
Development University
Decent Work and Economic Growth Tom Coughlin
Disaster Mitigation, Preparedness, Response & Recovery Mariya Zheleva, SUNY Albany
Good Health and Well Being Khanjan Mehta, Lehigh
Quality Education Pritpal Singh, Villanova, USA
Other Related United Nations Sustainable Development Goals Silvia Figueira, Santa Clara University, USA
Technology Impacts on Societal Evolution Joyojeet Pal, University of Michigan
Technologies that promote gender equality and the empowerment of women and girls (SDG5) Kathleen Kramer, USD
## Reviewers

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<th>Title</th>
<th>Given name</th>
<th>Surname</th>
<th>Affiliation</th>
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<tr>
<td>Mr.</td>
<td>Hakiri</td>
<td>Akram</td>
<td>Laboratoire d'Architecture et d'Analyse des Systèmes</td>
<td>France</td>
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<td>Ireland</td>
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<td>Calderon Cordova</td>
<td>Universidad Tecnica Particular de Loja</td>
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<td>Chakraborty</td>
<td>Johnson C. Smith University</td>
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<td>Rahmad</td>
<td>Dawood</td>
<td>Universitas Syiah Kuala</td>
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<td>Dr.</td>
<td>Xavier</td>
<td>Fernando</td>
<td>Ryerson University</td>
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<td>Prof.</td>
<td>Anna</td>
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<td>ComNets, University of Bremen</td>
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<td>Dr.</td>
<td>Kenneth</td>
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<td>Agyei</td>
<td>Fosu</td>
<td>Walter Sisulu University</td>
<td>South Africa</td>
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<td>Prof.</td>
<td>Shaddi</td>
<td>Hasan</td>
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<td>Germany</td>
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<td>Kejriwal</td>
<td>University of Southern California</td>
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<td>Albert</td>
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<td>Lingnan University</td>
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<td>Dr.</td>
<td>Maria</td>
<td>Lopez Molina Guadalupe</td>
<td>Universidad Iberoamericana Puebla</td>
<td>Mexico</td>
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<td>Prof.</td>
<td>Pietro</td>
<td>Manzoni</td>
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<td>Spain</td>
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<td>Mr.</td>
<td>Robert</td>
<td>Nutter</td>
<td>IEEE PES SES DC Working Group</td>
<td>USA</td>
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<td>Prof.</td>
<td>Mehul</td>
<td>Raval</td>
<td>School of Engineering and Applied Science, Ahmedabad University</td>
<td>India</td>
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<td>Dr.</td>
<td>Alan</td>
<td>Rocha</td>
<td>National Institute of Technical Teachers Training And Research Bhopal Goa Extension Centre</td>
<td>India</td>
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<td>Mr.</td>
<td>Jaykumar</td>
<td>Sheth</td>
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<td>Prof.</td>
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<td>Mr.</td>
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<td>Infra Innovations, Inc.</td>
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<td>Dr.</td>
<td>Wenbo</td>
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Sponsors, Patrons & Exhibitors

Organizational Patrons

Platinum Patrons

MOVE Vehicle

As a proud GHTC Supporter, IEEE-CNSV is hosting the MOVE Community Outreach Truck and participating in the conference!

Gold Patrons

EPICS stands for Engineering Projects in Community Service, founded in 1995 at Purdue University. EPICS in IEEE was founded in 2009 and has facilitated more than 130 projects in over 30 countries and has impacted more than 250,000 people through our university initiative and K-12 initiative.

Venue Patron

Student Attendance Grant

Silver Patron

https://www.scu.edu/

http://www.comsocscv.org/
Viodi (pronounced V-O-D) aims to be the premier provider of information and assistance to independent communications service providers and their vendors in their efforts to add value to their broadband networks.

The Global Innovation Exchange (GIX) is a collaboration between major research universities and companies from around the world. GIX represents a new model of learning and practice focused on developing leaders in innovation who work collaboratively on solving global challenges. Academic Network members promote GIX to their students, connect faculty with relevant areas of research expertise, and offer projects to GIX learners in connection with industry partners. Industry Consortium members gain access to the GIX community of faculty, inventors and learners, and may submit projects for students in the launch phase of the curriculum.

https://gixnetwork.org/
Climate-driven disasters are increasing exponentially – requiring backup power sources, often in the form of fossil fuel-powered generators. Paradoxically, the use of these generators contributes to greater greenhouse gas emissions (and other toxins) which further exacerbates the problem! NUE’s solar powered solutions help break this cycle.

Our goal is to bring affordable clean energy, to anyone, anywhere.

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IEEE Engineering Medicine & Biology Society

IEEE Microwave Theory & Techniques Society

IEEE Power & Energy Society™

IEEE Smart Village
eSmart Village
Power a Village, Empower Community
IEEE Standards Association (IEEE SA) provides a neutral and open environment that empowers innovators – across borders and disciplines – to develop standards and solutions that shape and improve technology for the benefit of industry, society and humanity.

Our vision is to serve the U.S. IEEE member by being the technical professional's best resource for achieving lifelong career vitality and by providing an effective voice on policies that promote U.S. prosperity.
VENUE

Venue

The 12th IEEE Global Humanitarian Technology Conference (IEEE GHTC 2022) will take place from September 8 to 11, 2022 in person at Santa Clara University (SCU) in the John and Susan Sobrato Campus for Discovery and Innovation (SCDI), Building (#402).

SCU main entrance is located at 500 El Camino Real, Santa Clara, CA 95053, USA. See SCU Campus Map (https://www.scu.edu/map/) and building info page at (https://www.scu.edu/map/location/247).

Travel
Santa Clara University is located in the heart of Silicon Valley just 5 miles from the San Jose International Airport and about 35 miles south of the San Francisco International Airport. The campus is easily reachable from U.S. Highway 101, Interstate 880, and Interstate 280.

For travel to the US, please refer to the CDC guidelines (https://www.cdc.gov/coronavirus/2019-ncov/travelers/). Note: The conference is not liable for any sort of loss, damage or sickness caused by communicable disease.

COVID Policy
IEEE GHTC 2022 was planned to be an in-person event. The GHTC 2022 Organizing Committee understands that everyone is concerned with the situation regarding COVID-19. Our primary concern is for the health and welfare of all of the attendees, staff and workers involved in GHTC 2022. We will require all attendees to wear masks. (Masks will be available at registration). In addition, we will be following the guidelines/mandates set forth by the IEEE and the County of Santa Clara: https://covid19.sccgov.org/covid19-guidelines.
VENUE

Rooms

All conference sessions (excluding the Banquet) are in the Sobrato Campus for Discovery and Innovation (SCDI), Building (#402) on SCU Campus.

GHTC is using the following SCDI rooms:

Level 1: 1301 (session), 1302 & 1308 (auditorium, plenary sessions)
Level 2: 2302, 2301
Level 3: 3301, 3302
Ground Level (breakfast, lunch)

The IEEE MOVE truck will be in the Leavey Center Lot Parking.

The Conference Banquet will be in the Locatelli Center Building.
https://goo.gl/maps/7Te5h7DQ1e4ZH8uN6
## SCHEDULE

### Thursday, September 8th, 2022

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<th>Time/Room</th>
<th>SCDI 2302</th>
<th>SCDI 1301</th>
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<td>4:00 – 6:00 PM</td>
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<td>Ground Floor, SCDI</td>
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<td>6:00 – 9:00 PM</td>
<td>Special Session: Diversity in the Workplace: Retaining Early Career Women and Minority Engineers by IEEE-CNSV (6pm Pizza; 7pm Session)</td>
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### Friday, September 9th, 2022

<table>
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<th>Time/Room</th>
<th>SCDI 3302</th>
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<th>SCDI 2301</th>
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<th>SCDI 3301</th>
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<tr>
<td>8:00 AM – 8:45 AM</td>
<td>Breakfast</td>
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<td>8:45 AM – 9:00 AM</td>
<td>Opening Remarks (Dr. Behnam Dezfouli and Dr. Elizabeth Belding)</td>
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<td>9:00 AM – 9:30 AM</td>
<td>Keynote: To Care, and How We Get There (Dr. Neha Kumar, Georgia Tech)</td>
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<td>9:35 AM – 10:05 AM</td>
<td>Keynote: Technology’s True Promise Lies in the Good we can Do (Janice Zdankus, Vice President, Office of CTO, Hewlett Packard Enterprise)</td>
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<td>10:10 AM – 10:40 AM</td>
<td>Plenary: Federal humanitarian engineering: what programs are out there? (Aline D. McNaull, Senior Legislative Representative, IEEE-USA)</td>
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<tr>
<td>10:40 AM – 11:00 AM</td>
<td>Break</td>
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<td>11:00 AM – 12:00 PM</td>
<td>Technical Sessions (Parallel Sessions)</td>
<td>FTS1 Connectivity &amp; Comm in Support of Development</td>
<td>FTS2 Good Health and Well Being (SDG3)</td>
<td>FTS3 Agriculture &amp; Food Security (SDG2)</td>
<td>FTS4 Disaster Mitigation, Preparedness, Response &amp; Recovery</td>
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<td>12:00 PM – 1:00 PM</td>
<td>Lunch Break</td>
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<td>1:00 PM – 1:50 PM</td>
<td>Panel Discussion: Quality Education Online and the Way Forward (Moderator: Patrick Kane, Infineon Technologies)</td>
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<td>2:00 PM – 2:30 PM</td>
<td>Plenary: One Week Wonder - Emergency PPE Delivery via A Global Humanitarian Collaboration of Makers (Kelly Yamanishi and Eric Hess, Maker Nexus, a nonprofit Makerspace in Sunnyvale, CA, USA)</td>
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<td>2:35 PM – 3:05 PM</td>
<td>Plenary: Introducing the West Coast MOVE Truck (Tim Lee, IEEE Region 6 Director)</td>
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<td>3:30 PM – 5:00 PM</td>
<td>Demonstration of the MOVE Vehicle</td>
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<td>3:20 PM – 5:00 PM</td>
<td>Technical Sessions (Parallel Sessions)</td>
<td>FTS6 Connectivity &amp; Comm in Support of Development</td>
<td>FTS7 Good Health and Well Being (SDG3)</td>
<td>FTS8 Agriculture &amp; Food Security (SDG2)</td>
<td>FTS9 Affordable &amp; Clean Energy (SDG7)</td>
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<td>6:00 PM – 9:00 PM</td>
<td>Special Session: Communications, computing, and power during disaster response by IEEE-CNSV (6pm Pizza; 7pm Session)</td>
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| 9:00 AM – 9:30 AM  | SCDI 1302 and 1308 | Plenary: Academic Programs in Humanitarian Engineering  
(Moderator: Pritpal Singh, Villanova University; Allan Baez Morales, Santa Clara University and Khanjan Mehta, Lehigh University) |
| 9:35 AM – 10:05 AM | SCDI 1302 and 1308 | Keynote: IT for Sustainability (Puneet Sharma, HPE)                               |
| 10:10 AM – 10:40 AM | SCDI 1302 and 1308 | Plenary: Revolutionizing the Retail Informal Sector in Africa: Use Case of the Smart Kibanda Project  
(Kithinji Muriungi; Chris Murimi, Moi University, Nairobi, Kenya) |
| 10:40 AM – 11:00 AM| SCDI 1302 and 1308 | Break                                                                            |
| 11:00 AM – 12:00 PM| SCDI 3302, SCDI 2302, SCDI 2301, SCDI 1301, SCDI 3301 | Technical Sessions (Parallel Sessions)  
SATS1 Quality Education (SDG4)  
SATS2 Good Health and Well Being (SDG3)  
SATS3 Agriculture & Food Security (SDG2)  
SATS4 Disaster Mitigation, Preparedness, Response & Recovery  
SATS5 Other Related UN SGD |
| 12:00 PM – 1:00 PM | Ground Floor, SCDI | Lunch Break                                                                      |
| 1:00 PM – 1:40 PM  | SCDI 1302 and 1308 | Plenary: Introduction to EPICS in IEEE (Stephanie Gillespie, EPICS in IEEE Committee Chair, and Associate Dean from Tagliatela College of Engineering of University of New Haven) |
| 1:45 PM – 2:30 PM  | SCDI 1302 and 1308 | Panel: Advancing DEI in Journalism with Tech: Opportunities and Guardrails (Moderator: Subbu Vincent, Markkula Center for Applied Ethics, SCU) |
| 2:35 PM – 3:05 PM  | SCDI 1302 and 1308 | Plenary: Minimizing the Ecological Footprint using Machine Learning (Dr. Vishnu S. Pendyala, San Jose State University) |
| 3:20 PM – 5:00 PM  | SCDI 3302, SCDI 2302, SCDI 2301, SCDI 1301, SCDI 3301 | Technical Sessions (Parallel Sessions)  
SATS6 Quality Education (SDG4)  
SATS7 Good Health and Well Being (SDG3)  
SATS8 Agriculture & Food Security (SDG2)  
SATS9 Decent Work and Economic Growth (SDG8)  
OPEN |
| 6:00 PM – 9:00 PM  | Locatelli Building | Conference Banquet  
Remarks: SCU Speaker; Tim Lee (IEEE R6); Tom Coughlin (IEEE CNSV & IEEE SSIT); Winncy Du (IEEE SCV); Stephanie Gillespie (IEEE EPICS) |
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<th>Time</th>
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<td>8:00 AM – 9:00 AM</td>
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<td>SCDI 1302 and 1308</td>
<td>Keynote: Does Gender Impact Startup Funding Success? A Data-Driven Perspective (Maya Ackerman, Assistant Professor of Computer Science and Engineering, Santa Clara University)</td>
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<td>9:35 AM – 10:05 AM</td>
<td>SCDI 1302 and 1308</td>
<td>Keynote: How the Internet Improves Humanity (Eric Goldman, Professor of Law, Santa Clara University)</td>
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<td>10:10 AM – 10:50 AM</td>
<td>SCDI 1302 and 1308</td>
<td>Panel: Web3 and Human Rights (Moderator: Michael Kleinman, Director, Silicon Valley Initiative, Amnesty /AIUSA)</td>
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<td>1:00 PM – 1:50 PM</td>
<td>SCDI 1302 and 1308</td>
<td>Panel: HAC Capacity Building (Moderator: Pritpal Singh, IEEE Humanitarian Activities Committee)</td>
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<td>2:00 PM – 2:30 PM</td>
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<td>Plenary: Clean energy solutions replacing portable fossil fuel generators: Technology and lessons from Ukraine and Hurricane Ida (Paul Shmotolokha, New Use Energy)</td>
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<td>2:30 PM – 2:50 PM</td>
<td>SCDI 1302 and 1308</td>
<td>Closing Remarks and GHTC 2023 Preview</td>
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<td>3:10 PM – 5:00 PM</td>
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<td>Technical Sessions (Parallel Sessions)</td>
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<td>6:00 PM – 8:00 PM</td>
<td>SCDI 1302 and 1308</td>
<td>Co-located event: IEEE CS SCV Chapter Presentations (Registration Managed by CS SCV)</td>
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Workshops

Machine Learning for Social Good

September 8th, 2022, 12:30 PM – 3:30 PM

Organizers

- Rakshit Agrawal, Vice President of Research & Development, Camio Inc.
- Charles Delahunt, Senior Research Scientist, GH Labs

This session will focus on topics around the applications of machine learning in the social good domains. We will discuss a framework centered around identifying the important societal challenges where problems can be defined for ML capabilities. We then describe the process to develop machine learning models and deploy them in the real world. We will also include case studies of ML driven systems actively being used in real-world scenarios.

The workshop will cover the following:

1. Introduction to the concepts and frameworks for developing ML solutions for social good applications.
2. Interactive session for brainstorming solution design on certain topics
3. Invited talks (~25 minutes) on key topics, connected together with contextual material, along with Q/A.
4. Closing, further resources, questions and discussion as wished.

Rakshit Agrawal leads the engineering team at Camio and focuses on Machine Learning and Computer Vision. His expertise spans AI, Machine Learning, Crowdsourcing, HCI, ICTD and AI for Social Good. Rakshit is a trusted subject matter expert and has worked on neural networks, security and AI for Microsoft, Nvidia and eBay. He received his PhD in Computer Science from the University of California, Santa Cruz.

Charles Delahunt has 9 years of experience applying ML to global health projects including malaria diagnosis, vitamin A testing via eye videos, ultrasound, helminth egg detection, and pregnancy risk assessment. He has also held a postdoc in the University of Washington’s applied math department, focused on ML methods.
WORKSHOPS

Building Wireless Sensing Systems (using Infineon Wireless IoT Devices)

September 8th, 2022, 12:30 PM – 3:30 PM

Organizer

• Patrick Kane, Infineon, San Jose, USA

In this workshop, you learn how to use low-cost and energy efficient IoT devices for sensing and communication purposes. You will be building sample applications to collect environmental information and transmit them wireless. This three-hour hands-on IoT and sensor workshop will feature the ultra-low power PSoC™ 6 (Programmable System on Chip) and ModusToolbox™ software. The workshop will consist of an overview of Infineon’s technology portfolio and continue with hands-on exercises programming the PSoC™ 6 to interface with various sensors and Bluetooth® via your mobile device. The attendees will leave with a knowledge of Infineon products that can be used to create low-power, greener projects and the ModusToolbox™ software design flow. Attendance is limited to 30. As we get closer to the conference date confirmed attendees will receive information on which software to install for the hands-on portion of the workshop.

Why Attend: Infineon is one of the 10 largest semiconductor companies in the world and is the #1 semiconductor supplier to the automotive industry. Infineon has a broad portfolio of electronics that aims to make life greener, safer, and easier. You are (likely to be) already using our products – from the security chip in your credit card to multiple devices in your automobile. Attend the workshop and find out more about them.

GHTC and IEEE Consulting Network Synergies

September 8th, 2022, 12:30 PM – 3:30 PM

Organizers

• Joel Kent, IEEE-CNSV Board Member, IEEE Consultants’ Network of Silicon Valley (IEEE-CNSV) and
• Kim Parnell, Ph.D., P.E. (Parnell Engineering & Consulting (PEC) & IEEE-CNSV Board Member)

Consultants’ Network of Silicon Valley (CNSV) is a network that promotes the skills of its consultants, fosters collaboration among its members, creates alliances with other IEEE chapters, and provides educational opportunities in Silicon Valley. With a membership of nearly 200 consulting engineers, IEEE-CNSV is a premier source of high-tech consulting talent. This session will discuss how CNSV can work with the GHTC community. For example, initiatives by people
and organizations in the GHTC community may find help from technology experts within CNSV. Also, people in the GHTC community may speak at CNSV meetings to expand awareness of their work.

Taking advantage of an opportunity to highlight truly outstanding humanitarian leadership, CNSV will conclude the session with three brief but spectacular pre-recorded presentations.

- **Dr. Elizabeth Hausler**, CEO and founder of **Build Change**, will explain how her organization helped over 330,000 citizens of emerging nations build homes and schools better after natural disasters.
- Development of medical devices that have served over a million patients in over 70 countries will be described by **Dr. Krista Donaldson**, CEO and founder of **Equalize Health**.
- To wrap it up, **Dr. Martin Fisher**, CEO and co-founder of **Kickstart International**, will share the impressive impact of low-cost irrigation pumps in Africa to attack dual problems of hunger and poverty. Martin Fisher served as an example for both Krista Donaldson and Elizabeth Hausler. All 3 companies are shining examples of applying advanced engineering skills and creativity to develop products to address challenging problems worldwide. In this environment, constraints like low cost, durability, and accessibility are critical for success.

**Joel Kent** has been active in the IEEE Consultants’ Network of Silicon Valley (CNSV), serving as Treasurer in 2019-2020 and as a **Director** since 2021. He is a consultant specializing in applied physics. Before semi-retiring as a consultant, Joel had experience in both academia and industry, being an assistant professor of physics for five years followed by decades in industry contributing to the development of touchscreen technology. He is an inventor listed on 99 US patents. Joel led the effort to develop this presentation and hopes it will be both engaging and valuable.

**Kim Parnell, Ph.D., PE** is Principal and Founder of **Parnell Engineering & Consulting** (PEC), an engineering consulting firm focusing on providing litigation support as an Expert Witness and engineering support for early stage medical device and technology companies, and an **IEEE-CNSV Board Member**. Dr. Parnell is a Stanford PhD and MSME in Mechanical Engineering, holds a BES from Georgia Tech, and is also a Registered Professional Mechanical Engineer in California. He is an ASME Fellow, an IEEE Senior Member, and a Member of SAE and ASM. He has over 35 years of consulting experience including design, regulatory, and failure/reliability issues of a variety of consumer products, medical devices, and industrial equipment covering a wide range of equipment and systems.

**Panelists:**
Andrew Wolfe, Ph.D., Wolfe Consulting and Board Member, IEEE Consultants’ Network of Silicon Valley (IEEE-CNSV). Andrew’s Skills include consumer electronics, computer systems, IC design, mechatronics, sensors, nd embedded software and expert witness work on patents and IP strategy. Andrew is an IEEE Fellow “for contributions in hardware code compression of embedded software, power consumption analysis, and optimization.”

Daniel K. Lottis, Ph.D., head of CLSE Consulting, has been a member of CNSV since 2019. After five years at Western Digital, he returned to freelancing. He has provided technical consulting to several early-stage startups, as well as marketing support to an engineering firm specializing in simulations. Recently he has served as a language interpreter in settings ranging from corporate labs and boardrooms to Zoom meetings. Daniel’s history with GHTC dates to 2013, when he focused on identifying and booking invited and keynote speakers. Daniel’s support for GHTC continued until about 2018. That year Daniel was re-appointed to the IEEE Humanitarian Activities Committee, on which he had served between 2014 and 2016. Then, as Chair for IEEE Special Interest Group on Humanitarian Technology (SIGHT) worldwide, Daniel worked to support projects worldwide. Daniel’s interest in the role of Engineers and Scientists in Sustainable development led him to serve for two years on the leadership committee for the SCV Society for Social Implications of Technology Chapter. Similarly, Daniel’s focus as a freelancer has been mostly for clients active in Sustainable Development or closely related activities.

Thomas M. Coughlin, Ph.D., IEEE Life Fellow, is President, Coughlin Associates is a digital storage analyst and business and technology consultant. He has over 40 years in the data storage industry with engineering and senior management positions at several companies. Coughlin Associates consults, publishes books and market and technology reports (including The Media and Entertainment Storage Report and an Emerging Memory Report), and puts on digital storage-oriented events. He is a regular storage and memory contributor for forbes.com and M&E organization websites. He is an IEEE Fellow, Past-President of IEEE-USA, Past Director of IEEE Region 6 and Past Chair of the Santa Clara Valley IEEE Section, Chair of the Consultants’ Network of Silicon Valley and is also active with SNIA and SMPTE. For more information on Tom Coughlin and his publications and activities go to www.tomcoughlin.com.
Plenaries and Keynotes

GHTC 2022 Features these Keynote and Plenary Speakers:

- **Keynote: Connecting the Unconnected;** Kurtis Heimerl, Assistant professor from The University of Washington
- **Keynote: Technology’s True Promise Lies in the Good we can Do;** Janice Zdankus, Vice President of Quality from Hewlett Packard Enterprise
- **Plenary: Federal humanitarian engineering: what programs are out there?;** Aline D. McNaul Senior Legislative Representative, IEEE-USA
- **Plenary: One Week Wonder – Emergency PPE Delivery via A Global Humanitarian Collaboration of Makers;** Kelly Yamanishi and Eric Hess from Maker Nexus, a non-profit Makerspace
- **Plenary: Introducing the West Coast IEEE MOVE Truck;** Tim Lee, IEEE Region 6 Director
- **Keynote: To Care, and How We Get There;** Neha Kumar, Associate Professor from Georgia Tech, USA
- **Keynote: IT for Sustainability;** Puneet Sharma, Distinguished Technologist from Hewlett Packard Labs, USA
- **Plenary: Revolutionizing the Retail Informal Sector in Africa: Use Case of the Smart Kibanda Project;** Kithinji Muriungi; Chris Murimi from Moi University in Nairobi, Kenya
- **Plenary: Introduction to EPICS in IEEE;** Stephanie Gillespie, EPICS in IEEE Committee Chair, and Associate Dean from Tagliatela College of Engineering of University of New Haven
- **Keynote: Minimizing the Ecological Footprint using Machine Learning;** Vishnu S. Pendyala from San Jose State University
- **Keynote: Does Gender Impact Startup Funding Success? A Data-Driven Perspective;** Maya Ackerman, Assistant Professor of Computer Science and Engineering from Santa Clara University
- **Keynote: How the Internet Improves Humanity;** Eric Goldman, Professor of Law from Santa Clara University
- **Plenary: Clean energy solutions replacing portable fossil fuel generators: Technology and lessons from Ukraine and Hurricane Ida;** Paul Shmotolokha from New Use Energy
Keynote: To Care, and How We Get There

September 9th, 2022
9:00 AM – 9:30 AM, Location: SCDI 1302 and 1308

Neha Kumar, Associate Professor, Georgia Tech, USA

Care shows up in many ways and forms in technology research, design, and practice, and increasingly so. Touching upon some of these wide-ranging manifestations of care in technological interactions, this talk will consider also what futures of care work might look like. It will conclude with some lessons for futures of work more broadly, and how we might infuse these with care.

Bio. Dr. Neha Kumar is an Associate Professor at Georgia Tech, where she works at the intersection of human-centered computing and global development, with a joint appointment in the Sam Nunn School of International Affairs and the School of Interactive Computing. She was trained as a computer scientist, designer, and ethnographer at UC Berkeley and Stanford University, and thrives in spaces where she can wear these three hats at once. Her research engages feminist perspectives and assets-based approaches towards designing technologies for/with underserved communities. She currently serves as the president of ACM SIGCHI. Website: [www.nehakumar.org](http://www.nehakumar.org)

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Keynote: Technology’s True Promise Lies in the Good we can Do

September 9th, 2022
9:35 AM – 10:05 AM, Location: SCDI 1302 and 1308

Janice Zdankus, Vice President, CTO Technology Strategy and Innovation for Social Impact from Hewlett Packard Enterprise, USA

Why and how can we as leaders in industry and academia better ‘connect the dots’ between innovation and improved societal outcomes? Students of engineering and technology disciplines often express their reason for choosing their field of study and careers is because of their interest and motivation to design the improvements in the world in which we all live and work. Statistics show that many who chose to leave the field did not feel fulfilled in this vision. Yet, most major improvements in our world over the last twenty plus years were conceived of and driven by innovations in engineering, technology and science. Many companies design “tech for good” initiatives to demonstrate core values, retain and motivate talent, partnerships, and systems thinking. With an eye towards creating positive impact and to better prepare for disruptions through the pace of digital transformation, examples of designing and implementing best practices for tech for good programs are shared. And, hear more about how the critical role of at least one
explosive area—the role of data—will drive significant advancement in building a more sustainable and equitable world.

**Bio:** Janice Zdankus is Vice President, Technology Strategy and Innovation for Social Impact in Hewlett Packard Enterprise’s Office of the CTO. In this role, Zdankus is leading innovation to improve the ways data can be generated and exchanged equitably and efficiently. She also leads HPE’s Tech for Good program demonstrating that technology has the potential to drive real and positive change if harnessed effectively. By bringing together industry, technology, academia, and government partners to solve key societal challenges, global impact can be delivered and scaled.

Zdankus is a member of the World Economic Forum’s Transformation Leader Network for Food Systems Innovation. She partners to enable world-leading agriculture research and practice. Innovative technologies like Internet of Things (IoT), AI, Data Fabric and high performance compute are being applied to accelerate prediction, response, and solutions to world hunger and global health challenges, including COVID19.

Zdankus is an active supporter of increasing the interest and representation of youth in the Science, Technology, Engineering and Math (STEM) fields. Zdankus is a co-founder of the Curated Pathways to Innovation non-profit personalized learning program focused on using AI and machine learning technology to broaden the representation and inclusion of minorities and females in computing. She serves on the Boards of Directors for the National Center for Women in Technology (NCWIT) and CPI.

Zdankus earned Bachelor of Science degrees in Computer Science and Industrial Management from Purdue University, where in 2010 she was named Outstanding Computer Science alumna. She also holds an MBA degree from Santa Clara University. She has been named “Top 50 Woman in Tech” (2018) and a “T 50 Diverse Leader in California” (2020) by the National Diversity Council.

**Plenary: Federal humanitarian engineering: what programs are out there?**

**September 9th, 2022**
10:10 AM – 10:40 AM, Location: SCDI 1302 and 1308

**Aline D. McNaul**, Senior Legislative Representative, IEEE-USA

The pandemic has brought with it a global discussion of broadband access for services ranging from at home learning to telehealth. Throughout the federal government, an awareness of communication challenges has risen to the forefront of societal issues as offices work from home. This focus has led to a growth in resources to improve communication and access to computer-based resources. As the engineering community looks to address global challenges including improving health technology and access to health services, strengthening electric grids in isolated
areas, and providing internet access, there are many opportunities at the federal level for funding and resources for these projects. The pandemic has highlighted the need for some of these projects and as such the federal research agencies are continuously adjusting funding for projects based on these needs. This talk will provide an overview of programs at the Department of Energy, USAID, NIST, NSF and other research agencies that look to address areas of humanitarian need. The recently passed CHIPS Act included authorizations for the National Science Foundation, National Institute of Standards and Technology, as well as some portions of the Department of Energy. Other recent congressional actions on energy and international aid will also be discussed. This talk will address how some of the program changes within these federal agencies could benefit the humanitarian engineering community.

Bio: Aline McNaull works on energy, space, defense and research policy on behalf of IEEE-USA members and is the staff lead for IEEE-USA’s research and development policy committee, the committee on aerospace and transportation, as well as the energy policy committee. She collaborates closely with the Coalition for National Security Research, Energy Sciences Coalition, Coalition for National Science Funding and the Task Force on American Innovation. As an advocate for IEEE-USA members, she has influenced legislation on issues and programs at DOD, DOE, NASA, NIST, and NSF. Previously, she was a semiconductor engineer at Raytheon and a patent examiner for the U.S. Patent and Trademark Office. She holds a BA in physics from Bryn Mawr College.

Plenary: One Week Wonder – Emergency PPE Delivery via A Global Humanitarian Collaboration of Makers

September 9th, 2022
2:00 PM – 2:30 PM, Location: SCDI 1302 and 1308

Kelly Yamanishi*/Eric Hess, Maker Nexus, a nonprofit Makerspace in Sunnyvale, CA, USA
When the state of California shut down all but essential services on March 19, 2020, Maker Nexus was not quite a year in business as a non profit organization offering a community makerspace. Based at the time on a membership use model, 100% in person, Maker Nexus suddenly faced an existential crisis. One week later, Maker Nexus was delivering hospital approved, sterilizable and reusable face shields, as well as other PPE at no charge directly to grateful, exhausted, medical professionals. A prototype was developed in less than 24 hours based on a global open source collaboration. During the next 48 hours, Maker Nexus delivered prototypes to local hospitals, allowing us to iterate and refine the design. Hospital approval achieved, a committed group of staff, members and volunteers swung into action to deliver. Over the next few weeks the delivery network spread out across the country and even outside the US borders. In the end, Maker Nexus and its team of volunteers directly manufactured and delivered over 85,000 reusable face shields at no charge to medical professionals throughout the United States. Maker Nexus’ design and shared resources, including staff and members, combined with other local manufacturing companies as they were able to come up to speed to deliver over 300,000 additional face shields at no charge before the need could be met by traditional manufacturing. Having experienced the power of the open source, nonprofit maker space model in rapid response to a global emergency, Maker Nexus can share an entirely different perspective on the value of the maker movement community and local makerspaces to responses to global humanitarian crises.

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**Plenary: Introducing the West Coast IEEE MOVE Truck — Keynote and Demonstration**

*September 9th, 2022*

*2:35 PM – 3:05 PM, Location: SCDI 1302 and 1308*

*Tim Lee, IEEE Region 6 Director*

MOVE Community Outreach, an IEEE-USA Initiative, is an emergency relief program committed to assisting victims of natural disasters with short-term communications, computer, and power solutions. These temporary emergency relief provisions help those affected stay connected and make sure they can access the help they need. Services include phone charging, internet & communications support, and lighting to disaster victims.
Bio. Timothy Lee is IEEE Region 6 Director and an active member and supporter of the MOVE initiative. He is currently a Boeing Technical Fellow at The Boeing Company in Southern California and leads the development of disruptive microelectronics technologies for advanced communications networks and sensor systems for airborne and space applications.

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**Plenary: Academic Programs in Humanitarian Engineering**

**September 10th, 2022**

**9:00 AM – 9:30 AM, Location: SCDI 1302 and 1308**

**Moderator: Pritpal Singh, Villanova University; Allan Baez Morales, Santa Clara University and Khanjan Mehta, Lehigh University**

Discussion on academic programs in humanitarian engineering with Frugal Innovation Hub of Santa Clara University and Montaintop Initiative of Lehigh University.

**Moderator.** Pritpal Singh is a professor of electrical engineering at Villanova University, where he teaches courses on semiconductor microelectronics, power electronics renewable energy systems, sustainable product development for low resource settings, and information and communication technologies for development (ICT4D). He has developed a telehealth project in Nicaragua, supervised students from Villanova and the Universidad Nacional de Ingenieria (Nicaragua) on humanitarian engineering capstone projects, and worked with UNICEF in Nicaragua, Burundi, and Zimbabwe giving workshops on renewable energy and entrepreneurship. He has recently worked on humanitarian projects in Ecuador in renewable energy and connectivity with colleagues from the Escuela Politecnica de Littoral (ESPOL).

**Allan Baez Morales** is Director of Programs and Partnerships for Frugal Innovation Hub, and focuses on the development of signature programs with university, corporate and social enterprise partners to create opportunities for faculty and students to engage in the development and implementation of humanitarian technology solutions.

**Khanjan Mehta** is the inaugural Vice Provost for Creative Inquiry and Director of the Mountaintop Initiative at Lehigh University. Mehta champions the creation of learning environments and ecosystems where students, faculty, and external partners come together to increase their capacities for independent inquiry, take intellectual risks and learn from failure, recognize problems and opportunities, and effect constructive and sustainable change.
Keynote: IT for Sustainability

September 10th, 2022
9:35 AM – 10:05 AM, Location: SCDI 1302 and 1308

Puneet Sharma, Distinguished Technologist, Hewlett Packard Labs, USA

Humanity is exposed with decades of irresponsible behaviour, resulting in dramatic need for decarbonization and preventing climate change. Consumption of fossil- and other carbon-based fuels and generation of electricity from unsustainable energy sources propagates in every facet of our life. In IT, we are uniquely positioned to measure sustainability of our solutions and cradle-to-cradle, from production to disposal, of equipment and service usage. By making IT sustainable, we can expand it to the rest of enterprises and eventually all vertical markets and to our daily life. In this talk, I will showcase how we at Hewlett Packard Labs develop IT Technologies for Sustainability, contributing to humanity and planet earth. I will discuss megatrends and present some solutions.

Bio: Puneet Sharma is Director, Networking & Distributed Systems Lab and a Distinguished Technologist at Hewlett Packard Labs where he leads Edge to Cloud Infrastructure research portfolio. His research focusses on Edge Computing, SDWAN, Virtualization, IoT, NFV, SDN, Applied Machine Learning, Network Monitoring, Wireless Networks, and Data Center Networks. Prior to joining the HP Labs in 1998, he received his PhD in Computer Science from the University of Southern California. He also holds a B.Tech. in Computer Science and Engineering from Indian Institute of Technology (IIT) Delhi. His work on Mobile Collaborative Communities was featured in the New Scientist Magazine. He has also participated in various standardization efforts. Recently he contributed to the UPnP's QoS Working Group efforts as co-author for QoSv3 standards. Earlier, he had co-authored the IETF standards' RFCs on the multicast routing protocol PIM. Puneet was the Co-Chair of 13th IEEE LANMAN Workshop in April 2004. He is an IEEE Fellow and a Distinguished Scientist of ACM.

Plenary: Revolutionizing the Retail Informal Sector in Africa: Use Case of the Smart Kibanda Project

September 10th, 2022
10:10 AM – 10:40 AM, Location: SCDI 1302 and 1308

Kithinji Muriungi; Chris Murimi, Moi University Nairobi, Kenya

A Kibanda is an open-fronted cubicle structure used for informal business. About 80% of retailers in Kenya operate a kibanda: meaning for every 100m distance, there is a high probability of having at least one Kibanda. It is estimated that the retail informal sector contributes about 55% of GDP in the sub – Saharan Africa. The kibanda owners live near their business location because
they have to move business commodities to and from their residences to business locations. The profit margins are small and highly variable. Kibandas do not support a 24-hour business environment.

A Smart Kibanda is a project that aims to solve the major problems in traditional retail outlets in an affordable, secure, convenient, employing great aesthetics, and provision of renewable energy and storage units. The smart kibanda project is fully funded by IEEE Special Interest Group on Humanitarian Technology (SIGHT) / Humanitarian Activities Committee (HAC). Four fully functional units have been designed, developed, and deployed in Eldoret, Kenya as pilots. The presentation highlights lessons learnt, challenges encountered, principles in local problem solving using technologies, accomplishments, engineering design principles, recommendations, replicability, and the importance of working with the community to facilitate user-centered design for sustainability and scalability purposes.

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**Plenary: Introduction to EPICS in IEEE**

September 10th, 2022  
1:00 PM – 1:40 PM, Location: SCDI 1302 and 1308

Stephanie Gillespie, EPICS in IEEE Committee Chair, and Associate Dean, Tagliatela College of Engineering, University of New Haven in West Haven, CT, USA

EPICS in IEEE is a committee within the IEEE Educational Activities Board that believes that service-learning can positively impact our students and our communities. We believe in empowering engineers and technical professionals to impact communities, both local and global. In this workshop, the audience will receive a brief introduction to service learning pedagogy, our committee’s funding priorities, and the proposal process to receive funds from our committee. We will include a summary of best practices for project proposals as well, to increase the likelihood of selection for funding from our committee. There will be time for questions and answers at the end, or you can review our materials online at [www.epics.ieee.org](http://www.epics.ieee.org).

**Bio:** Dr. Stephanie Gillespie is the 2022 EPICS in IEEE Committee Chair, and Associate Dean at the Tagliatela College of Engineering at the University of New Haven in West Haven, CT. In this role, she leads initiatives related to accreditation, admissions, course management and scheduling, facilities, student concerns, and also coordinates the Introduction to Engineering course. Since entering academia, she has been passionate about preparing the next generation of engineers with real-life skills, specifically by teaching courses in the area of engineering service learning, first-year engineering courses, and the Grand Challenges of Engineering. Her current research interests span multiple areas of engineering education including maker-spaces, multidisciplinary teams, gender diversity and minority retention, and entrepreneurial mindset. Her PhD from Georgia Tech focused on machine learning and signal processing for affective
computing, specifically detecting stress and depression in adults with communication disorders. She is actively involved in the Society of Women Engineers, EPICS in IEEE, and ASEE.

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**Keynote: Minimizing the Ecological Footprint using Machine Learning**

**September 10th, 2022**

2:40 PM – 3:10 PM, Location: SCDI 1302 and 1308

**Vishnu S. Pendyala, San Jose State University**

Ecological footprint is a measure of the use of all forms of nature, including energy, for humans to continue their day-to-day living. Ecological footprint per capita is one of the most widely recognized indicators of environmental sustainability and the world today is concerned about this sustainability. Machine Learning has been significantly applied in the critical areas of ecological sustainability and social innovation. This talk will highlight some of these applications such as to predict and analyze the ecological footprint, optimizing transportation logistics, and waste management. Societies rely heavily on energy as it aids in human sustainability. Carbon footprints make up a large part of the ecological footprint primarily because of energy consumption. Energy consumption and associated CO$_2$ emissions around the world have increased rapidly in the past few decades due to the rising population and living standards. The talk will also focus on how Machine Learning is used in the renewable energy sector, which is critical to sustainable progress. The talk will conclude with some possible future directions.

**Bio:** Dr. Vishnu S. Pendyala is a faculty member of the Department of Applied Data Science at San Jose State University and the chair of IEEE Computer Society, Silicon Valley Chapter. He has over two decades of experience with software industry leaders like Cisco and Synopsys in the Silicon Valley, USA. During his recent 3-year term as an ACM Distinguished speaker and before that as a researcher and industry expert, he gave numerous (50+) invited talks. He holds MBA in Finance and PhD, MS, and BE degrees in Computer Engineering from US and Indian universities. Dr. Pendyala taught a one-week course sponsored by the Ministry of Human Resource Development (MHRD), Government of India, under the GIAN program in 2017 to Computer Science faculty from all over the country and delivered the keynote in a similar program sponsored by AICTE, Government of India in 2022. Dr. Pendyala’s book, “Veracity of Big Data: Machine Learning and Other Approaches to Verifying Truthfulness” made it to several libraries, including those of MIT, Stanford, CMU, and internationally. His upcoming edited book, “Machine Learning for Societal Improvement, Modernization, and Progress” is already indexed by multiple libraries internationally. Dr. Pendyala served on the Board of Directors, Silicon Valley Engineering Council during 2018-2019. He received the Ramanujan memorial gold medal at State Math Olympiad and has been a successful leader during his undergrad years.
Keynote: Does Gender Impact Startup Funding Success? A Data-Driven Perspective

September 11th, 2022
9:00 AM – 9:30 AM, Location: SCDI 1302 and 1308

Maya Ackerman, Assistant Professor of Computer Science and Engineering, Santa Clara University, USA

Research has long demonstrated the benefits of diversity for team performance, including startup success. Nevertheless, investors remain less likely to invest in women compared to their male counterparts. This talk will share data-driven research findings that shed light on the nature and extent of gender bias in venture capital allocation. Solutions for lasting change will be discussed.

Bio: Researcher and entrepreneur, Dr. Maya Ackerman, is an expert on Machine Learning, named “Woman of Influence” by the Silicon Valley Business Journal. She is an Assistant Professor at the Department of Computer Science and Engineering at Santa Clara University, and CEO/Co-Founder of musical AI startup, WaveAI. Interviews with Dr. Ackerman appeared on NBC News, New Scientist, Sirius XM, and international television stations across the globe, and she has been an invited speaker at the United Nations, IBM Research, Google, and Stanford University, amongst many other venues. She earned her PhD in Computer Science from the University of Waterloo, and held Postdoctoral Fellowships at Caltech and UC San Diego.

Keynote: How the Internet Improves Humanity

September 11th, 2022
9:35 AM – 10:05 AM, Location: SCDI 1302 and 1308

Eric Goldman, Professor of Law, Santa Clara University, USA

Given the time and energy we spend worrying about the Internet’s flaws, it’s easy to forget how the Internet makes our lives better in many ways. This talk will highlight one underappreciated aspect: how the Internet has the capacity to improve the human species by increasing pro-social interactions and reducing anti-social ones. The talk will also show how this scenario probably won’t be realized because of misguided regulatory efforts to “fix” the Internet.

Bio: Dr. Eric Goldman is Associate Dean for Research, Professor of Law, Co-Director of the High Tech Law Institute, and Supervisor of the Privacy Law Certificate, at Santa Clara University School of Law. His research and teaching focuses on Internet law, and he blogs on that topic at the Technology & Marketing Law Blog [http://blog.ericgoldman.org].
Plenary: Clean energy solutions replacing portable fossil fuel generators: Technology and lessons from Ukraine and Hurricane Ida

September 11th, 2022
2:00 PM – 2:30 PM, Location: SCDI 1302 and 1308

Paul Shmotolokha, New Use Energy, USA

This presentation will show the progress of highly mobile alternatives to using portable fossil fuel generators in disaster or humanitarian relief efforts to provide critical power when the grid is down or where it does not exist. First I will examine the use cases and dynamics of where power is commonly needed citing disaster relief and medium term support after Hurricane Ida. We will then examine humanitarian assistance examples in Ukraine supporting both internal and international refugees as well as communications, medical, municipal and relief organizations. From a technology perspective, it will focus on safe and energy dense Lithium Ion batteries, generation options with a focus on lightweight solar, refrigeration, weatherization, power conversion, and ability to scale towards larger longer lasting microgrids. The difference between portability and mobility, Cost models, Speed of deployment, re-use and Logistics lessons will be covered.

Bio: Co-Founder of New Use Energy, Paul Shmotolokha currently serves as Chairman and CEO of the company which aims to replace fossil fuel portable generators with clean energy solutions. Paul lead the international business of Power Solutions provider Alpha Technologies from 2003 through 2019, eventually holding the title of Senior Vice-President International Operations and Government Relations. During that time, Paul also served as Chairman of the Board of Cgates, the leading broadband operator in Lithuania. Paul also founded Coppervale Enterprises in 2008 which for over 10 years pioneered Sustainability and energy efficiency strategies in the Broadband industry. Prior to 2003, Paul held executive positions at Encore International in Beijing, China, and in Europe at Metromedia International Telecommunications and Multichoice. Paul currently serves on the US Chamber of Commerce Small Business Council and the Board of Directors of the US Philippines Society. Paul served as an officer for 13 years in the US Army Reserves and was nominated in 2019 by the President of the United States to serve as Vice-Chairman of the Export Import Bank of the United States.

Paul graduated Magna Cum Laude with a Bachelor of Science in Foreign Service from Georgetown University. Additionally, Paul performed graduate work International Relations at the Institute for International Studies at the Universidad de Chile as well as executive business studies at London Business School and Dartmouth College. Paul speaks fluent Ukrainian, Russian and Spanish and is an avid tennis player having reached the national 50 and over tournament.
Panel Sessions

GHTC 2022 will feature these Panel Sessions

- **Special Session: Diversity in the Workplace: Retaining Early Career Women and Minority Engineers** (September 8, 2022 | 6:00 – 9:00 PM)
- **Quality Education Online and the Way Forward** (September 9, 2022 | 1:00 PM – 2:00 PM)
- **Special Session: Communications, Computing and Power during Disaster Response** (September 9, 2022 | 6:00 – 9:00 PM)
- Advancing DEI in Journalism with Tech: Opportunities and Guardrails (September 10, 2022 | 2:00 PM – 2:50 PM)
- **Web3 and Human Rights** (September 11, 2022 | 10:00 AM – 10:50 AM)
- **IEEE HAC Capacity Building** (September 11, 2022 | 1:00 PM – 1:50 PM)
- *Safety for Autonomous Vehicles: Addressing Interoperability and Dependability Challenges with IEEE P2851* (September 11, 2022 | 6:00 PM – 8:00 PM)

**co-located event open to public; separate registration required**

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**Special Session: Diversity in the Workplace: Retaining Early Career Women and Minority Engineers**

**September 8th, 2022**

7:00 PM – 9:00 PM, Location: SCDI 1302 and 1308

(Networking & Pizza in Courtyard 6:00 PM – 7:00 PM)

**Moderator: Erin Shelby, Shelby HR Solutions**

Facilitators for this session include:

- Erin Shelby, PHR, Shelby HR Solutions.
- Claire Wemp, Ph.D., Thermal Applications Engineer, DuPont.
- Juan Vargas, M.S., Senior Project Engineer, Devcon Construction, and
- Jeewika Ranaweera, Ph.D., Principal Hardware Engineer, Oracle.

Organized by:

Kim Parnell, Ph.D., P.E., Parnell Engineering & Consulting & IEEE-CNSV Board Member
Note: IEEE-CNSV organized free event open to the public, but pre-registration is required due to limited space. GHTC attendees must also register for this public event.

Gender equality is one of the UN Sustainable Development Goals on which GHTC is focused. Additionally, the technology industry is increasingly aware of the need to include a variety of backgrounds and capabilities in the workforce. This session will be an open discussion on challenges and opportunities facing young engineers, women in engineering, and minorities in academia and industry. Topics to be covered include opportunities for networking, mentoring, and finding role models.

Claire Wemp is a Thermal Applications Engineer at the DuPont Silicon Valley Technology Center in Sunnyvale, CA. She is a Mechanical Engineering graduate of both Santa Clara University and UC Berkeley for her MS/PhD. Throughout that time, she has held leadership roles in both University and Professional chapters of Society of Women Engineers (SWE) and is the chair for the Bay Area DuPont Women’s Network. She is a passionate advocate for increasing the pipeline of women and underrepresented minorities in STEM fields. In her free time, Claire does music and dance and lives in San Jose’s Japan Town with her husband.

Erin Shelby, owner of Shelby HR Solutions, is passionate about engaging with her clients, while collaborating with senior leadership in assessing and implementing integrity-based performance standards. Embracing a background in public and private companies, including 30 years of HR leadership for the US District Court, California State Assembly, Sutter Health and HGA Architects and Engineers, Erin navigates easily through bureaucratic organizations and has served in an advisory capacity to senior leadership up to and including the CEO.

Juan Vargas is a Senior Project Engineer at Devcon Construction in Milpitas, CA. He is a previously undocumented, first-generation college graduate who moved to the Bay Area from Southern California. Juan received his B.S. in Civil Engineering and M.S. in Construction Management from Santa Clara University. During his time at SCU, Juan was a seismic research assistant and was involved in multiple groups on campus, including the Society of Hispanic Professional Engineers, where he served as Vice President. He enjoys creating and maintaining new and old friendships, and he is always happy to share what he has learned, especially with people from underrepresented communities.

Jeewika Ranaweera is a Principal Hardware Engineer at Oracle and Chair, IEEE Women in Engineering (WIE) for the Santa Clara Valley (SCV) Section. She has a diverse engineering journey which began in Sri Lanka, then on to Cuba, then to Canada, and finally to Silicon Valley—where she works on cutting-edge technologies involving microprocessors. Jeewika considers engineering to be one of the most fascinating jobs in the world, making a difference to change the world for the better, being creative, and finding innovative solutions. Jeewika is a female technologist for the Oracle Education Foundation, a community leader for Oracle Women’s Leadership, a Diversity and Inclusion ambassador, a sustainability champion, and a member of Emergency Response/Search & Rescue teams. She received both a Ph.D. and M.A.Sc from the University of Toronto in Electrical and Computer Engineering.
Panel Discussion: Quality Education Online and the Way Forward

September 9th, 2022
1:00 PM – 2:00 PM, Location: SCDI 1302 and 1308

Moderator: Patrick Kane – Director of University Alliance Program, Infineon
(formerly Cypress)

Panelists:

- David Parent (Professor of Electrical Engineering, SJSU)
- C. Wang (Director, DigiKey Academic Program)

This panel will bring together industry and academic experts to discuss “quality education: a post-pandemic view.” Panelists will describe how they were able to carry on teaching during the pandemic and what lessons and methods they learned that they will continue using going forward.
Special Session: Communications, Computing, and Power during Disaster Response

September 9th, 2022
7:00 PM – 9:00 PM, Location: SCDI 1302 and 1308
(Networking & Pizza in Courtyard 6:00 PM – 7:00 PM)

Note: IEEE-CNSV organized free event open to the public, but pre-registration is required due to limited space. GHTC attendees must also register for this public event.

Moderator: David Snyder (PE, CISSP, CCSP, 42TEK LLC & IEEE-CNSV Board Member)

Panelists:

- Dustin Li, Special Programs Director, Information Technology Disaster Resource Center;
- Kevin Cox, CEO & Founder, Hope Crisis Response Network – Disaster Resource Village;
- Dave H. Crocker, Volunteer, Silicon Valley Chapter, Information & Planning Coordinator, American Red Cross, principal with Brandenburg InternetWorking, and Senior Member of IEEE
- Paul Shmotolokha, New Use Energy, USA
- William Torre, IEEE MOVE WEST Operations Lead

In conjunction with the presence of the MOVE Community Outreach truck at the conference, this is a panel discussion among representatives from organizations involved with emergency response and disaster recovery. MOVE also offers educational outreach. The focus will be on communications, computing, and power, but may expand from there. After a brief description of the MOVE truck, the emphasis will be on stories about what works and lessons learned.

Moderator.

David Snyder is the principal of 42TEK LLC and the Board Secretary for the IEEE Consultants Network of Silicon Valley. David helps organizations develop and implement new technologies and keep them secure. His experience includes companies like Apple, Google, Kaiser Permanente, PayPal, Yahoo!, and various startups for healthcare systems, electronic payments, mobile applications, and data security. David is also a member of the City of Campbell Community Emergency Response Team (CERT).
Panelists

Dustin Li, Special Programs Director, Information Technology Disaster Resource Center serves as the Special Programs Director for ITDRC, and led projectConnect – a program dedicated to helping to bridge the digital divide, exacerbated by COVID-19, by installing community WiFi access points. He also drives software, security, and toolchain infrastructure development efforts. He has responded with ITDRC to disasters including earthquakes, hurricanes, wildfires, tornados, and floods. Dustin is also a member of the United States federal National Disaster Medical System, providing communications support in medical crises.

Kevin Cox, CEO & Founder, Hope Crisis Response Network – Disaster Resource Village currently serves on eight Long-Term Recovery Groups across California. He has been a leader in Disaster Response and Recovery for two decades. Kevin is well known for training Long-Term Recovery Committees across the country. He has assisted in the creation of over 150 successful LTRs. Kevin teaches Volunteer Management, Donations Management, Community and Faith-Based Response. Known for his innovations, Kevin created the first mobile disaster base camp (Hope City) in America, which since has been cited as a model program by FEMA. Hope City was a driving force for rebuilding and recovery in Mississippi after Hurricane Katrina. The project partnered with 100 churches and Universities completing over 1400 projects and recruiting 4700 volunteers.

Dave H. Crocker, Volunteer, Silicon Valley Chapter, Information & Planning Coordinator, American Red Cross is a principal with Brandenburg InternetWorking and Senior Member of IEEE. As a volunteer for the Red Cross, Dave is active in disaster response efforts, with roles in sheltering, as well as information and planning. Over the past 50 years he has worked in the early Internet research community, led product development efforts, and founded several startups, serving as CEO for one. He has authored 69 IETF Requests for Comments and is a co-recipient of the 2004 IEEE Internet award for his work on email.

Paul Shmotolokha, CEO & Chairman of the Board, New Use Energy Solutions (NUE) has more than 25 years international and domestic executive experience leading high performance teams, strategy, operations, sales, marketing, business development and government relations in technology, telecommunications and renewable energy market segments. Unique understanding of global business practices and markets, global business and government networking, multiple consumer cultures and diverse operating environments gained from working in or marketing to over 100 countries on all continents. NUE provides clean energy solutions replacing portable fossil fuel generators. It has provided equipment for numerous
disaster responses and humanitarian assistance in Ukraine supporting both internal and international refugees as well as communications, medical, municipal and relief organizations.

**William Torre** received his Bachelor’s Degree in Electrical Engineering at the University of Missouri in 1977, and a Masters Degree in Electrical Engineering at California Polytechnic State University. He recently retired from University of California San Diego as Program Director of Energy Storage and Systems with oversight of power system research, development and testing of advanced energy storage systems, and integration of renewable energy systems. In November 2011, he retired from San Diego Gas and Electric Co. (SDG&E) after 30 years, and his last assignments from 2010-2012 were as SDG&E’s Manager of Research and Development, Manager of Technology Innovation and Development group in Transmission & Distribution Engineering division where the testing of new power system developments as part of the SDG&E smart grid program. From 2008 – 2010 he held the position of Chief Engineer at SDG&E, and provided Engineering oversight and coordination for all engineering. Relevant to the value streams from distributed generation associated with the T&D issues from the decommissioning of SONGS, he served from 1996 to 2008 as SDG&E’s Manager of Transmission Engineering & Design where he managed 27 engineers and designers for engineering all overhead and underground transmission lines for the SDG&E’s service territory. From Jan, 1981 - June, 1988; Adjunct Professor, Electrical and Computer Engineering, Initiated the successful power engineering program at SDSU.

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**Panel Discussion: Advancing DEI in Journalism with Tech: Opportunities and Guardrails**

September 10th, 2022
2:00 PM – 2:50 PM, Location: SCDI 1302 and 1308

Moderator: Subbu Vincent, Markkula Center for Applied Ethics, SCU

Panelists:

- **Lisa Armstrong**, Associate Dean and Professor, UC Berkeley Graduate School of Journalism
- **Yi Fang**, Associate Professor, Department of Computer Science and Engineering, Santa Clara University
- **Subbu Vincent**, Director of Journalism and Media Ethics, Markkula Center for Applied Ethics, Santa Clara University

Diversity, equity, and inclusion (DEI) are fundamental to promoting robust journalism that supports a healthy society, by fostering well-researched, complex stories that explore different perspectives and voices. News stories can be audited for how often they are quoting people around a diversity categorization, e.g., gender, race/ethnicity, expertise, etc. DEI audits are high touch and
expensive to do manually. Not surprisingly, they are usually done only once a year and retroactively by a few well funded, large news organizations. But for everyday reporters and editors who are part of large and small newsrooms, there is no “everyday system” to monitor their own quoting patterns and nudge themselves towards DEI norms. To start addressing this gap with human-augmented technology, the Markkula Center for Applied Ethics and the School of Engineering at SCU joined hands to prototype an on-demand DEI audit toolkit for US newsrooms based on AI and NLP technologies, funded partly by the Google News Initiative and Facebook Research. This panel will discuss the “What, So What, and Now what” of technology solutions for DEI audits from an opportunities and guardrails perspective.

**Panel Discussion: Web3 and Human Rights**

*September 11th, 2022*

*10:00 AM – 10:50 AM, Location: SCDI 1302 and 1308*

**Moderator:** Michael Kleinman, Director, Silicon Valley Initiative, Amnesty, AIUSA

**Panelists:**

- **Lia Holland** (Campaigns and Communications Director, Fight for the Future)
- **Mai Ishikawa Sutton** (Co-founder and editor of COMPOST, an online magazine about the digital commons, as well as a Digital Commons Fellow with the Commons Network and a contributor to the Internet Archive’s work on the decentralized web)
- **Nathan Schneider** (Assistant Professor, Media Studies at the University of Colorado Boulder and Director, Media Enterprise Design Lab)

The internet in the West today is dominated by a handful of companies, including Amazon, Apple, Google, Meta (Facebook), Microsoft, TikTok, and Twitter. Each company sets the terms and conditions for how individuals engage with their platform and can potentially ban them according to those terms, including for their speech. In return for free access to these platforms, individuals provide personal information and effectively lose control over that information. In some countries, governments have pressured tech companies to censor and provide information on individuals and groups that the government disfavors.

Web3 – sometimes called the Distributed Web – potentially represents a fundamental change in this dynamic, especially as regards the question of control. The number “3” implies a specific historical view of how the web evolved, from an initial “open” state in the 1990s and early 2000s (web1) towards ever greater corporate centralization and power, leading to the dominance of a handful of Big Tech corporations today (web2). It posits web3 as the next step in this evolution, towards a more decentralized future, in which our online experience is not shaped (or not only shaped) by these companies.

This panel will examine the positive and negative implications that web3 has for human rights, including access and equity, privacy, social mobilization online, and other issues.
Panel Discussion: IEEE HAC Capacity Building

September 11th, 2022
1:00 PM – 1:50 PM, Location: SCDI 1302 and 1308

Moderator: Pritpal (Pali) Singh, IEEE Humanitarian Activities Committee

Panelists:
- Sampathkumar Veeraraghavan, Global Chair, IEEE Humanitarian Activities Committee
- Lwanga Herbert, Chair, IEEE SIGHT Steering Committee

This session will present various global programs offered by HAC and the best practices for the design and development of the IEEE HAC/SIGHT sustainable development program. The audience will have an opportunity to network and learn about the successfully implemented HAC projects.

Moderator. Pritpal Singh is a professor of electrical engineering at Villanova University, where he teaches courses on semiconductor microelectronics, power electronics renewable energy systems, sustainable product development for low resource settings, and information and communication technologies for development (ICT4D). He has developed a telehealth project in Nicaragua, supervised students from Villanova and the Universidad Nacional de Ingenieria (Nicaragua) on humanitarian engineering capstone projects, and worked with UNICEF in Nicaragua, Burundi, and Zimbabwe giving workshops on renewable energy and entrepreneurship. He has recently worked on humanitarian projects in Ecuador in renewable energy and connectivity with colleagues from the Escuela Politecnica de Littoral (ESPOL).

Sampathkumar Veeraraghavan is a globally renowned technologist best known for his technological innovations in addressing global humanitarian and sustainable development challenges. He is a seasoned technology and business leader with over 17 years of experience in the Top 500 Fortune companies. Throughout his career, he has led business-critical strategic R & D programs and successfully delivered cutting-edge technologies in the areas of Conversational Artificial Intelligence (AI), Natural Language Understanding, Cloud computing, Data privacy, Enterprise systems, Infrastructure technologies, Assistive and Sustainable technologies that were targeted to benefit millions of global users. Sampath served as an expert in the 2020 Broadband Commission working group on school connectivity co-chaired by UNESCO, UNICEF, and ITU to drive “GIGA,” a Global School Connectivity Initiative. He is the founder and president of “The Brahmam,” a humanitarian program delivering next-generation social innovations to achieve sustainable development goals and benefit marginalized communities globally. Over a decade, he has launched large-scale transformational global initiatives that brought together academic institutions, industry leaders, and Government
agencies to address pressing global challenges faced by children with disabilities, impoverished women, and students from marginalized communities in developing nations.

**Lwanga Herbert** currently serves as Chair of the 2021 IEEE SIGHT Steering Committee and is a member of the Humanitarian Activities Committee (HAC) established by the IEEE Board of Directors. Mr. Herbert is an innovation and technology enthusiast and practitioner inspired by technological solutions to diverse problems and challenges. He is the Co-founder of M/S LOG`EL GROUP LTD, an IT company based in Uganda and the co-founder of Log`el Science Foundation, a civil society organization which conducts research and development in science and technology. Mr. Herbert was a beneficiary of the presidential innovation fund in Uganda from 2000-2005, which allowed him to develop a variety of innovations to address corresponding community challenges. These innovations were patented with the support of the Uganda National Council for Science and Technology. He has made several contributions within the IEEE community, which includes co-founding the IEEE Uganda Section and implementing humanitarian projects and programs in Uganda with IEEE support.

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**Organized by IEEE CS SCV Chapter (co-located event)**

**Safety for Autonomous Vehicles: Addressing Interoperability and Dependability Challenges with IEEE P2851**

**September 11th, 2022**
**6:00 PM – 8:00 PM, Location: SCDI 1302 and 1308**

The IEEE P2851 standard defines a dependability lifecycle of products with focus on interoperable activities related to functional safety and its interactions with reliability, cybersecurity, SOTIF (Safety of the intended functionality) and real time. The standard also describes methods, description languages, data models, and databases that have been identified as necessary or critical, to enable the exchange/interoperability of data across all steps of the lifecycle encompassing activities executed at IP, SoC, system and item levels, in a technology independent way across application domains such as automotive, industrial, medical and avionics safety critical systems.

The speaker, who is the chair of the working group on the standard will provide more insights into the topic.
Special Events

MOVE Truck Display
September 9, 3:30-5:00 PM

Solar Trailer Display
GHTC 2022 Program

The first day of GHTC 2022 features three half-day Workshops, Networking Social and Special Event. The workshops are: “Machine Learning for Social Good,” “Building Wireless Sensing Systems,” and “GHTC and IEEE Consulting Network Synergies,” and the Special evening Event is produced with the IEEE Consultants’ Network of Silicon Valley (CNSV) on “Communications, Computing, and Power during Disaster Response”.

The conference program includes keynote and plenary presentations by professionals from academia, industry, and non-profit organizations. Our speakers are Neha Kumar (Associate Professor, Georgia Tech), Janice Zdankus, (Vice President, CTO Technology Strategy and Innovation for Social Impact, HPE), Tim Lee (Director, IEEE Region 6), Puneet Sharma (Distinguished Technologist, Hewlett Packard Labs), Kithinji Muriungi and Chris Murimi (Moi University Nairobi, Kenya), Stephanie Gillespie (Chair, EPICS in IEEE Committee), Vishnu S. Pendyala (Professor, San Jose State University), Maya Ackerman (Assistant Professor, Santa Clara University), Eric Goldman (Professor, Santa Clara University), Kelly Yamanishi and Eric Hess (Maker Nexus, USA), Paul Shmotolokha (New Use Energy), and Aline D. McNaull (IEEE-USA).

The conference program also includes several panel discussions and sessions with the following titles: “Diversity in the Workplace: Retaining Early Career Women and Minority Engineers,” “Quality Education Online and the Way Forward,” “Communications, Computing, and Power during Disaster Response,” “Advancing DEI in Journalism with Tech: Opportunities and Guardrails,” “Web3 and Human Rights”, and “IEEE HAC Capacity Building.”

The GHTC 2022 Technical Program consists of over 80 papers in 27 sessions covering 11 tracks:

- Affordable & Clean Energy (SDG7)
- Agriculture & Food Security (SDG2)
- Clean Water & Sanitation (SDG6)
- Connectivity & Communication in Support of Development
- Decent Work and Economic Growth (SDG8)
- Disaster Mitigation, Preparedness, Response & Recovery
- Good Health and Well Being (SDG3)
- Other Related United Nations Sustainable Development Goals
- Quality Education (SDG4)
- Technologies that promote gender equality and the empowerment of women and girls (SDG5)
- Technology Impacts on Societal Evolution
Thursday, September 8

Thursday, September 8 12:30 - 15:30 (America/Los_Angeles)

**W1: Workshop: Machine Learning for Social Good**

**Room:** SCDI 2302

Rakshit Agrawal, Vice President of Research & Development, Camio Inc. and Charles Delahunt, Senior Research Scientist, GH Labs

This session will focus on topics around the applications of machine learning in the social good domains. We will discuss a framework centered around identifying the important societal challenges where problems can be defined for ML capabilities. We then describe the process to develop machine learning models and deploy them in the real world. We will also include case studies of ML driven systems actively being used in real-world scenarios.

**W2: Workshop: Building wireless sensing systems using PSoC-6**

**Room:** SCDI 1301

Patrick Kane and Vikram Ramanna, Infineon

In this workshop, you learn how to use low-cost and energy efficient IoT devices for sensing and communication purposes. You will be building sample applications to collect environmental information and transmit them wireless. This three-hour hands-on IoT and sensor workshop will feature the ultra-low power PSoC™ 6(Programmable System on Chip) and ModusToolbox™ software. The workshop will consist of an overview of Infineon's technology portfolio and continue with hands-on exercises programming the PSoC™ 6 to interface with various sensors and Bluetooth® via your mobile device.

**W3: Workshop: GHTC and IEEE Consulting Network Synergies**

**Room:** SCDI 1302

Organizers:

- Joel Kent, IEEE-CNSV Board Member, IEEE Consultants' Network of Silicon Valley (IEEE-CNSV) and
- Kim Parnell, Ph.D., P.E. (Parnell Engineering & Consulting (PEC) & IEEE-CNSV Board Member)

Consultants’ Network of Silicon Valley (CNSV) is a network that promotes the skills of its consultants, fosters collaboration among its members, creates alliances with other IEEE chapters, and provides educational opportunities in Silicon Valley. With a membership of nearly 200 consulting engineers, IEEE-CNSV is a premier source of high-tech consulting talent. This session will discuss how CNSV can work with the GHTC community. For example, initiatives by people and organizations in the GHTC community may find help from technology experts within CNSV. Also, people in the GHTC community may speak at CNSV meetings to expand awareness of their work.
PROGRAM SESSIONS

Panelists:

- Andrew Wolfe, Ph.D., Wolfe Consulting and Board Member, IEEE Consultants' Network of Silicon Valley (IEEE-CNSV)
- Daniel K. Lottis, Ph.D., head of CLSE Consulting, member of CNSV since 2019
- Thomas M. Coughlin, Ph.D., IEEE Life Fellow, President, Coughlin Associates, digital storage analyst and business and technology consultant

Thursday, September 8 16:00 - 18:00 (America/Los_Angeles)

NWS: Networking Social

Thursday, September 8 18:00 - 21:00 (America/Los_Angeles)

CNSV Meeting: Diversity in the Workplace: Retaining Early Career Women and Minority Engineers

Rooms: SCDI 1302, SCDI 1308

IEEE-CNSV organized free event. Separate registration required

Pizza @ 6pm; session starts @ 7pm

Moderator: Erin Shelby, Shelby HR Solutions

Facilitators for this session include:

- Erin Shelby, PHR, Shelby HR Solutions,
- Claire Wemp, Ph.D., Thermal Applications Engineer, DuPont,
- Juan Vargas, M.S., Senior Project Engineer, Devcon Construction, and
- Jeewika Ranaweera, Ph.D., Principal Hardware Engineer, Oracle.

Organized by: Kim Parnell, Ph.D., P.E., Parnell Engineering & Consulting & IEEE-CNSV Board Member

Gender equality is one of the UN Sustainable Development Goals on which GHTC is focused. Additionally, the technology industry is increasingly aware of the need to include a variety of backgrounds and capabilities in the workforce. This session will be an open discussion on challenges and opportunities facing young engineers, women in engineering, and minorities in academia and industry. Topics to be covered include opportunities for networking, mentoring, and finding role models.
Friday, September 9

Friday, September 9 8:00 - 8:45 (America/Los_Angeles)

BKF: Breakfast

Friday, September 9 8:45 - 9:00 (America/Los_Angeles)

OP: Opening Remarks

Room: SCDI 1302
Dr. Behnam Dezfooli and Dr. Elizabeth Belding

Friday, September 9 9:00 - 9:30 (America/Los_Angeles)

K3: Keynote: To Care, and How We Get There

Rooms: SCDI 1302, SCDI 1308
Neha Kumar, Associate Professor, Georgia Tech, USA

Care shows up in many ways and forms in technology research, design, and practice, and increasingly so. Touching upon some of these wide-ranging manifestations of care in technological interactions, this talk will consider also what futures of care work might look like. It will conclude with some lessons for futures of work more broadly, and how we might infuse these with care.

Friday, September 9 9:35 - 10:05 (America/Los_Angeles)

K2: Keynote: Technology's True Promise Lies in the Good we can Do

Rooms: SCDI 1302, SCDI 1308
Janice Zdankus, Vice President, Tech Strategy and Innovation for Social Impact Office of the CTO, Hewlett Packard Enterprise, USA

Why and how can we as leaders in industry and academia better ‘connect the dots' between innovation and improved societal outcomes? Students of engineering and technology disciplines often express their reason for choosing their field of study and careers is because of their interest and motivation to design the improvements in the world in which we all live and work. Statistics show that many who chose to leave the field did not feel fulfilled in this vision. Yet, most major improvements in our world over the last twenty plus years were conceived of and driven by
innovations in engineering, technology and science. Many companies design "tech for good" initiatives to demonstrate core values, retain and motivate talent, partnerships, and systems thinking. With an eye towards creating positive impact and to better prepare for disruptions through the pace of digital transformation, examples of designing and implementing best practices for tech for good programs are shared. And, hear more about how the critical role of at least one explosive area—the role of data—will drive significant advancement in building a more sustainable and equitable world.

**Friday, September 9 10:10 - 10:40 (America/Los_Angeles)**

**P1: Plenary: Federal humanitarian engineering: what programs are out there?**

**Rooms:** SCDI 1302, SCDI 1308  
Aline D. McNaull, Senior Legislative Representative, IEEE-USA

The pandemic has brought with it a global discussion of broadband access for services ranging from at home learning to telehealth. Throughout the federal government, an awareness of communication challenges has risen to the forefront of societal issues as offices work from home. This focus has led to a growth in resources to improve communication and access to computer-based resources. As the engineering community looks to address global challenges including improving health technology and access to health services, strengthening electric grids in isolated areas, and providing internet access, there are many opportunities at the federal level for funding and resources for these projects. The pandemic has highlighted the need for some of these projects and as such the federal research agencies are continuously adjusting funding for projects based on these needs.

This talk will provide an overview of programs at the Department of Energy, USAID, NIST, NSF and other research agencies that look to address areas of humanitarian need. The recently passed CHIPS Act included authorizations for the National Science Foundation, National Institute of Standards and Technology, as well as some portions of the Department of Energy. Other recent congressional actions on energy and international aid will also be discussed. This talk will address how some of the program changes within these federal agencies could benefit the humanitarian engineering community.

**Friday, September 9 10:40 - 11:00 (America/Los_Angeles)**

**B1: Break**

Room: SCDI 1302
Friday, September 9 11:00 - 12:00 (America/Los_Angeles)

**FTS1: Connectivity & Communication in Support of Development**

**Room:** SCDI 3302  
Chair: Elizabeth Belding (UCSB, USA)

11:00 *Ageism and Its Impact on Information and Communications Technology Usage and Design*  
Kim T Nguyen (Alumna, University of Southern California, USA)

11:25 *The Challenge & Value of Dashboard Development during the COVID19 Pandemic*  
Kenny Meesters (Tilburg University, The Netherlands); Mats Visser (Vrije Universiteit, The Netherlands); Joris Wijnen (Tilburg University, The Netherlands); Kees Boersma (Vrije Universiteit, The Netherlands)

**FTS2: Good Health and Well Being (SDG3)**

**Room:** SCDI 2302  
Chair: Michele Parker (Santa Clara University, USA)

11:00 *A usability study of an innovative optical device for the diagnosis of schistosomiasis in Nigeria*  
Michel Bengtson (LUMC, The Netherlands); Adeola Onasanya (Researcher, The Netherlands); Prosper Oyibo (TU Delft / University of Lagos, The Netherlands); Brice Meulah (LUMC, The Netherlands); Karlheinz Tondo Samengo and Ingeborg Braakman (Delft University of Technology, The Netherlands); Wellington Aghoghovwia Oyibo (University of Lagos, Nigeria); Jan-Carel Diehl (Delft University of Technology, The Netherlands)

11:25 *EcoRealms: Improving Wellbeing and Enhancing Productivity Through Incorporating Nature into the Workplace*  
Evy M. Rahmey, Giavanna Gast, Sebastian R. Wick, Tram U. H. Vo, Margaret A. McLaughlin, Jonathan Osika, Brian C Slocum, Nicholas Sawicki and Khanjan Mehta (Lehigh University, USA)

**FTS3: Agriculture & Food Security (SDG2)**

**Room:** SCDI 2301  
Chair: Adil Usman (National Renewable Energy Laboratory, USA)

11:00 *Modular Methods for Oyster Mushroom Cultivation in Low-Resource Settings*  
William Yaeger, Muzammil Jawed, David Tauman, Philip T Ho, Asgar Ali, Naakesh N Gomanie and Khanjan Mehta (Lehigh University, USA)

11:25 *Assessment of Emissions with Carbon-smart Farming Practices and Participatory Sensing in Rice*
Rushikesh Dattatraya Kulat, Mariappan Sakkan, Prachin Jain, Sanat Sarangi and Srinivasu Pappula (Tata Consultancy Services, India)

**FTS4: Disaster Mitigation, Preparedness, Response & Recovery**

(Room: SCDI 1301
Chair: David M Snyder (42TEK, USA)

11:00 *User-driven flood response & monitoring information - Key findings of the Data4Human project*
Anne Schneibel, Nina Merkle and Marc Wieland (German Aerospace Center, Germany); Konstanze Lechner (German Aerospace Center (DLR), Germany); Seyedmajid Azimi, Fabian Henkel, Corentin Henry, Ralph Kiefl, Xiangtian Yuan and Monika Gaehler (German Aerospace Center, Germany)

11:25 *ULAT: Deployment of Dense and Nationwide Lightning Detection Network for Weather Forecasting in the Philippines*
Glenn Vincent Lopez, Jerico Orejudos and Adrian Aristotle Dellagas (Advanced Science and Technology Institute, Philippines)

**FTS5: Technologies that promote gender equality and the empowerment of women and girls (SDG5)**

(Room: SCDI 3301
Chair: Kathleen A Kramer (University of San Diego, USA)

11:00 *Brilliance Bias in GPT-3*
Juliana Shihadeh, Margareta Ackerman, Ashley Troske, Nicole Lawson and Edith Gonzalez (Santa Clara University, USA)

11:25 *A gender-smart simulator to reduce the financing gap for female entrepreneurs in emerging markets*
Misha Rawal and Jona Repishti (Massachusetts Institute of Technology (MIT) D-Lab, USA)

**Friday, September 9 12:00 - 13:00 (America/Los_Angeles)**

L1: Lunch
Friday, September 9 13:00 - 13:50 (America/Los_Angeles)

PNL1: Panel: Quality education online and the way forward

Rooms: SCDI 1302, SCDI 1308

Moderator: Patrick Kane - Director of University Alliance Program, Infineon (formerly Cypress)

Panelists:

- David Parent (Professor of Electrical Engineering, SJSU)
- C. Wang (Director, DigiKey Academic Program)

This panel will bring together industry and academic experts to discuss "quality education: a post-pandemic view." Panelists will describe how they were able to carry on teaching during the pandemic and what lessons and methods they learned that they will continue using going forward.

Friday, September 9 13:50 - 14:00 (America/Los_Angeles)

B2: Break

Friday, September 9 14:00 - 14:30 (America/Los_Angeles)

P2: Plenary: One Week Wonder - Emergency PPE Delivery via A Global Humanitarian Collaboration of Makers

Rooms: SCDI 1302, SCDI 1308

Kelly Yamanishi and Eric Hess, Maker Nexus, a nonprofit Makerspace in Sunnyvale, CA, USA

When the state of California shut down all but essential services on March 19, 2020, Maker Nexus was not quite a year in business as a non profit organization offering a community makerspace. Based at the time on a membership use model, 100% in person, Maker Nexus suddenly faced an existential crisis.

One week later, Maker Nexus was delivering hospital approved, sterilizable and reusable face shields, as well as other PPE at no charge directly to grateful, exhausted, medical professionals. A prototype was developed in less than 24 hours based on a global open source collaboration. During the next 48 hours, Maker Nexus delivered prototypes to local hospitals, allowing us to iterate and refine the design. Hospital approval achieved, a committed group of staff, members and volunteers swung into action to deliver.

Over the next few weeks the delivery network spread out across the country and even outside the US borders. In the end, Maker Nexus and its team of volunteers directly manufactured and delivered over 85,000 reusable face shields at no charge to medical professionals throughout the
UNited States. Maker Nexus' design and shared resources, including staff and members, combined with other local manufacturing companies as they were able to come up to speed to deliver over 300,000 additional face shields at no charge before the need could be met by traditional manufacturing.

Having experienced the power of the open source, nonprofit maker space model in rapid response to a global emergency, Maker Nexus can share an entirely different perspective on the value of the maker movement community and local makerspaces to responses to global humanitarian crises.

Friday, September 9 14:35 - 15:05 (America/Los_Angeles)

P3: Plenary: Introducing the West Coast IEEE MOVE Truck

Rooms: SCDI 1302, SCDI 1308
Tim Lee, IEEE Region 6 Director

MOVE Community Outreach, an IEEE-USA Initiative, is an emergency relief program committed to assisting victims of natural disasters with short-term communications, computer, and power solutions. These temporary emergency relief provisions help those affected stay connected and make sure they can access the help they need. Services include phone charging, internet & communications support, and lighting to disaster victims.

Friday, September 9 15:05 - 15:20 (America/Los_Angeles)

B3: Break

Friday, September 9 15:20 - 17:30 (America/Los_Angeles)

FTS10: Other Related United Nations Sustainable Development Goals

Room: SCDI 3301
Chair: John Gershenson (The Pennsylvania State University, USA)

15:20 Multiple disciplinary research collaboration in an academic environment: the university as a driver for frugal innovation
Tine Van Lommel and Herman Bruyninckx (Katholieke Universiteit Leuven, Belgium)

15:45 Detecting the destruction of populated sites in northeastern Nigeria from Sentinel-2 satellite imagery by EfficientNet
Yunya Gao (Paris Lodron University of Salzburg, Austria)
Comparing the robustness of U-Net, LinkNet, and FPN towards label noise for refugee dwelling extraction from satellite imagery
  Yunya Gao, Stefan Lang, Dirk Tiede, Getachew Gella and Lorenz Wendt (Paris Lodron University of Salzburg, Austria)

Determining which Carbon Capture Method and Application are Most Beneficial for Social Entrepreneurs in Kenya
  Matthew Costanzo, Zara Meyer and John Gershenson (The Pennsylvania State University, USA)

Motorcycle and Vehicle Detection for Applications in Road Safety and Traffic Monitoring Systems
  Gerson Gerard L. Cruz, Alysia Noreen P San Juan, Aaron Litonjua and Nathaniel Libatique (Ateneo de Manila University, Philippines); Jaime Luis E Honrado (Ateneo de Manila University & Skyeye, Inc., Philippines); Marion Ivan Tan (Ateneo de Manila University, Philippines)

FTS6: Connectivity & Communication in Support of Development
  Room: SCDI 3302
  Chair: Elizabeth Belding (UCSB, USA)

Social Media Data-Driven Sentiment Analysis for COVID-19 and COVID-19 Vaccines
  Ghaida Alorini and Danda B. Rawat (Howard University, USA)

Deep Learning-Based Path Loss Prediction Model for 5G mmWave
  Simon Karanja Hinga (Santa Clara University, USA); Oluwaseun Ajayi (Illinois Institute of Technology, USA); Tokunbo Ogunfunmi (Santa Clara University, USA)

Massive RF Simulation Applied to School Connectivity in Malawi
  Ermanno Pietrosemoli (ICTP & Fundacion EsLaRed, Italy); Marco Rainone (ICTP, Italy); Marco Zennaro (ICTP - The Abdus Salam International Centre for Theoretical Physics, Italy); Chomora Mikeka (Directorate of Science, Technology and Innovation, Malawi & Ministry of Education, Malawi)

RuralSync: Providing Digital Content to Remote Communities in the Philippines through Opportunistic Spectrum Access
  Julian III Eballa (Department of Science and Technology - Advanced Science and Technology Institute, Philippines); Philip A. Martinez (Department of Science and Technology - Advanced Science and Technology Institute & Electrical and Electronics Engineering Institute, Philippines); Jean Jay J Quitayen (Advanced Science and Technology Institute & Department of Science and Technology, Philippines); Ramon Vann Cleff B. Raro (Department of Science and Technology - Advanced Science and Technology Institute & University of the Philippines Diliman, Philippines)

Quantifying cost-benefit in emergency telecommunications investments: how pre-disaster preparedness pays
  Ria Sen (United Nations World Food Programme, Italy)
FTS7: Good Health and Well Being (SDG3)

**Room:** SCDI 2302

Chair: Cristina Mayr (Universidad de Montevideo, Uruguay)

15:20 *A Smart Prevention Management in Gestational Diabetes Mellitus*
Nattacha Palawat, Supaporn Kiattisin and Theeraya Mayakul (Mahidol University, Thailand)

15:45 *Towards Generating Contextual and Empathetic Response for Covid-related Queries*
Sowmya Rasipuram (Technology R&D Associate Principal, India & Accenture Labs); Anutosh Maitra (Accenture Services Pvt. Ltd., INDIA, India); Bishal Shaw (IIT Patna, India); Sriparna Saha (IIT Patna & Department of CSE, India)

16:10 *A Comparative Analysis Of Regression Algorithms With Genetic Algorithm In The Prediction Of Breast Cancer Tumors*
Joyce Ayoola and Tokunbo Ogunfunmi (Santa Clara University, USA)

16:35 *quEASY: A tilting interface to alleviate vehicle-induced motion sickness in passengers*
Vinitha Erusu, Soojin Hwang, Sebastian Kuhn, Manasa Sama and John Raiti (University of Washington, USA)

17:00 *Finite State Automata for Real-Time Health Electronic Record Update: A survey*
Jose M Ruiz Mejia, Atul Rawal and Danda B. Rawat (Howard University, USA)

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**Friday, September 9 15:20 - 17:00 (America/Los_Angeles)**

FTS8: Agriculture & Food Security (SDG2)

**Room:** SCDI 2301

Chair: Adil Usman (National Renewable Energy Laboratory, USA)

15:20 *Market demand analysis and validation of Ace Aquatec Seal Detection system for protecting salmonids from predation in fish farms*
Md Arif Reza Anwary (Edinburgh Napier University & Ace Aquatec Ltd, United Kingdom); Armina Goodlad, Donald Sutherland and Nathan Pyne-Carter (Ace Aquatec Ltd, United Kingdom); Amir Hussain (Edinburgh Napier University, United Kingdom)

15:45 *Micronutrient-Fortified Drinks: Commercial Products and Compelling Opportunities*
David Tauman, Philip T Ho, Naakesh N Gomanie, William Yaeger, Muzammil Jawed and Khanjan Mehta (Lehigh University, USA)

16:10 *Peanut maturity classification by features extracted from selected hyperspectral components*
Sree Nirmillo Biswash Tushar (University of Tennessee, Knoxville, USA); Soma Sarker, William Stapleton and Damian Valles (Texas State University, USA)

16:35 *Design and Testing of a Low-Cost Wheel-Driven Crop Sprayer*
Tatenda C Mashongedza and Heather R Beem (Ashesi University, Ghana)
PROGRAM SESSIONS

FTS9: Affordable & Clean Energy (SDG7)

**Room:** SCDI 1301
Chair: Tam Kemabonta (Arizona State University, USA)

15:20 *IEEE Smart Village Testbed Micro-grids and Sensors*
Shultz A Hartgrove IV, Kellen B Kennedy, Zane R McMorris, Sam W Siemer, Brad Oren and Alan Mickelson (University of Colorado at Boulder, USA)

15:45 *Accelerating Mini-grid Feasibility Assessments with Rapid Engineering and Business Model Evaluation*
Tam Kemabonta, Elena A van Hove, Nathan G Johnson and Abdulrahman Alsanad (Arizona State University, USA)

16:10 *The repurposing of nickel metal hydride hybrid electric vehicle batteries for solar energy storage applications in rural Pacific Island communities*
Brandon K Simons, Pritpal Singh, Iain Hunt and Jordan Ermilio (Villanova University, USA)

16:35 *SEMFI: A Software-Based and Real-Time Energy Monitoring Platform for WiFi IoT Devices*
Aastha Chawla, Nidusha Kannan, Sreya Goyalia, Vikram Ramanna, Jaykumar Sheth and Behnam Dezfooli (Santa Clara University, USA)

**Friday, September 9 15:30 - 17:00 (America/Los_Angeles)**

MOVE: Demo: Exhibiting the MOVE Truck
Leavey Center Lot Parking

**Friday, September 9 17:00 - 18:00 (America/Los_Angeles)**

B4: Break

**Friday, September 9 18:00 - 21:00 (America/Los_Angeles)**

SS: Panel: Communications, computing, and power during disaster response

Rooms: SCDI 1302, SCDI 1308

IEEE-CNSV organized free event. Separate registration required
Pizza @ 6pm; session starts @ 7pm
PROGRAM SESSIONS

Moderator: David Snyder of 42TEK LLC and Board Secretary for the IEEE Consultants’ Network of Silicon Valley

Panelists:
- Timothy Lee, Director, IEEE Region 6
- Dustin Li, Special Programs Director, Information Technology Disaster Resource Center
- Kevin Cox, CEO & Founder, Hope Crisis Response Network - Disaster Resource Village
- Dave H. Crocker, Volunteer, Silicon Valley Chapter, Information & Planning Coordinator, American Red Cross, principal with Brandenburg InternetWorking, and Senior Member of IEEE
- Paul Shmotolokha, New Use Energy, USA

In conjunction with the presence of the MOVE Community Outreach truck at the conference, this is a panel discussion among representatives from organizations involved with emergency response and disaster recovery. Besides providing onsite services for disaster recovery, MOVE also offers educational outreach regarding Science, Technology, Engineering and Mathematics (STEM). The focus will be on communications, computing, and power during disaster response, but may expand from there. After a brief description of the MOVE truck, the emphasis will be on stories about what works and lessons learned.
Saturday, September 10

Saturday, September 10 8:00 - 9:00 (America/Los_Angeles)

BKSA: Breakfast

Saturday, September 10 9:00 - 9:30 (America/Los_Angeles)

PAHP: Plenary: Academic Programs in Humanitarian Engineering

Rooms: SCDI 1302, SCDI 1308
Moderator: Pritpal Singh, Villanova University;
Allan Baez Morales, Santa Clara University; KhanJan Mehta, Lehigh University

Discussion on academic programs in humanitarian engineering with Frugal Innovation Hub of Santa Clara University and Montaintop Initiative of Lehigh University.

Saturday, September 10 9:35 - 10:05 (America/Los_Angeles)

K4: Keynote: IT for Sustainability

Rooms: SCDI 1302, SCDI 1308
Puneet Sharma, Distinguished Technologist, Hewlett Packard Labs, USA

Humanity is exposed with decades of irresponsible behaviour, resulting in dramatic need for decarbonization and preventing climate change. Consumption of fossil- and other carbon-based fuels and generation of electricity from unsustainable energy sources propagates in every facet of our life. In IT, we are uniquely positioned to measure sustainability of our solutions and cradle-to-cradle, from production to disposal, of equipment and service usage. By making IT sustainable, we can expand it to the rest of enterprises and eventually all vertical markets and to our daily life.

In this talk, I will showcase how we at Hewlett Packard Labs develop IT Technologies for Sustainability, contributing to humanity and planet earth. I will discuss megatrends and present some solutions.
P4: Plenary: Revolutionizing the Retail Informal Sector in Africa: Use Case of the Smart Kibanda Project

Rooms: SCDI 1302, SCDI 1308
Kithinji Muriungi and Chris Murimi, Moi University in Nairobi, Kenya

A Kibanda is an open-fronted cubicle structure used for informal business. About 80% of retails in Kenya operate a kibanda: meaning for every 100m distance, there is a high probability of having at least one Kibanda. It is estimated that the retail informal sector contributes about 55% of GDP in the sub-Saharan Africa. The kibanda owners live near their business location because they have to move business commodities to and from their residences to business locations. The profit margins are small and highly variable. Kibandas do not support a 24 hour business environment.

A Smart Kibanda is a project that aims to solve the major problems in traditional retail outlets in an affordable, secure, convenient, employing great aesthetics, and provision of renewable energy and storage units. The smart kibanda project is fully funded by IEEE Special Interest Group on Humanitarian Technology (SIGHT) / Humanitarian Activities Committee (HAC).

Four fully functional units have been designed, developed, and deployed in Eldoret, Kenya as pilots. The presentation highlights lessons learnt, challenges encountered, principles in local problem-solving using technologies, accomplishments, engineering design principles, recommendations, replicability, and the importance of working with the community to facilitate user-centered design for sustainability and scalability purposes.

Saturday, September 10 10:10 - 10:40 (America/Los_Angeles)

B5: Break

Saturday, September 10 11:00 - 12:00 (America/Los_Angeles)

SATS1: Quality Education (SDG4)

Room: SCDI 3302
Chair: Juliana Shihadeh (Santa Clara University, USA)

11:00 A Machine Learning-Based Automatic Feedback System to Teach Cybersecurity Principles to K-12 and College Students
Eric M Dillon, Craig Carpenter II, John Cook, Thomas Wills and Husnu S Narman (Marshall University, USA)
11:25 *The Cybersecurity Packet Control Simulator: CSPCS*  
Neil Loftus, Cameron Green and Husnu S Narman (Marshall University, USA)

**SATS2: Good Health and Well Being (SDG3)**

**Room:** SCDI 2302  
Chair: Priscilla Law (Santa Clara, USA)

11:00 *How WhatsApp is Transforming Healthcare Services and Empowering Health Workers in Low- and Middle-Income Countries*  
Noah Weaver, Anneke Roy, Skyler J Martinez, Naakesh N Gomanie and Khanjan Mehta (Lehigh University, USA)

11:25 *Use of Voluntary Cough Sounds and Deep Learning for Pulmonary Disease Screening in Low-Resource Areas*  
Ashley Mo and Emma Gui (University of Toronto Schools, Canada); Richard Fletcher (MIT, USA & Massachusetts General Hospital, USA)

**SATS3: Agriculture & Food Security (SDG2)**

**Room:** SCDI 2301  
Chair: Tine Van Lommel (KU Leuven, Belgium)

11:00 *Mitigation Intermediary Transactions within Kenya's Agricultural Supply Chain*  
John Gershenson, David Moyer and Megan Ostertag (The Pennsylvania State University, USA)

11:25 *Enhancing Stress Prediction Models for Rice with Ambient and Field Data in Rabi 2019-20*  
Prachin Jain, Swagatam Bose Choudhury, Sanat Sarangi and Srinivasu Pappula (Tata Consultancy Services, India)

**SATS4: Disaster Mitigation, Preparedness, Response & Recovery**

**Room:** SCDI 1301  
Chair: Tim Lee (IEEE MTT-S, USA)

11:00 *Prioritizing emergency evacuations under compounding levels of uncertainty*  
Lisa J Einstein, Robert J Moss and Mykel J Kochenderfer (Stanford University, USA)

11:25 *Blockchain-based Data Access Environment for Disaster Risk Reduction*  
Neil H Wasserman (George Washington University & Timewave Analytics, LLC, USA)
PROGRAM SESSIONS

SATS5: Other Related United Nations Sustainable Development Goals

Room: SCDI 3301
Chair: Allan Morales (Santa Clara University, USA)
11:00 Terrorism Detection and Approaches to Fairness: A Brief Literature Review
Cesa Salaam and Danda B. Rawat (Howard University, USA)
11:25 Connecting the Gold Supply Chain and SDGs: Communal Processing Plants as
Sociotechnical Ensembles to Reduce Mercury Pollution and Empower Artisanal Gold Mining
Communities
Mateo F Rojas (Colorado School of Mines); Juan Lucena (Colorado School of Mines &
Humanitarian Engineering, USA); Jessica Smith (Colorado School of Mines, USA); Oscar
Restrepo Baena (Universidad Nacional de Colombia, Colombia); Thomas J. Phelan
(United States Air Force Academy, USA)

Saturday, September 10 12:00 - 13:00 (America/Los_Angeles)
L2: Lunch

Saturday, September 10 13:00 - 13:40 (America/Los_Angeles)
P5: Plenary: Introduction to EPICS in IEEE
Rooms: SCDI 1302, SCDI 1308
Stephanie Gillespie, EPICS in IEEE Committee Chair, and Associate Dean from Tagliatela
College of Engineering of University of New Haven

EPICS in IEEE is a committee within the IEEE Educational Activities Board that believes that
service-learning can positively impact our students and our communities. We believe in
empowering engineers and technical professionals to impact communities, both local and global.
In this presentation, the audience will receive a brief introduction to service learning pedagogy,
our committee's funding priorities, and the proposal process to receive funds from our committee.
We will include a summary of best practices for project proposals as well, to increase the likelihood
of selection for funding from our committee. There will be time for questions and answers at the
end, or you can review our materials online at www.epics.ieee.org.
Saturday, September 10 13:45 - 14:30 (America/Los_Angeles)

PNL2: Panel: Advancing DEI in Journalism with Tech: Opportunities and Guardrails

**Rooms:** SCDI 1302, SCDI 1308

**Moderator:** Subbu Vincent. Markkula Center for Applied Ethics, SCU

**Panelists:**
- Lisa Armstrong, Associate Dean and Professor, UC Berkeley Graduate School of Journalism
- Yi Fang, Associate Professor, Department of Computer Science and Engineering, Santa Clara University
- Subbu Vincent, Director of Journalism and Media Ethics, Markkula Center for Applied Ethics, Santa Clara University

Diversity, equity, and inclusion (DEI) are fundamental to promoting robust journalism that supports a healthy society, by fostering well-researched, complex stories that explore different perspectives and voices.

News stories can be audited for how often they are quoting people around a diversity categorization, e.g., gender, race/ethnicity, expertise, etc. DEI audits are high touch and expensive to do manually. Not surprisingly, they are usually done only once a year and retroactively by a few well-funded, large news organizations. But for everyday reporters and editors who are part of large and small newsrooms, there is no "everyday system" to monitor their own quoting patterns and nudge themselves towards DEI norms.

To start addressing this gap with human-augmented technology, the Markkula Center for Applied Ethics and the School of Engineering at SCU joined hands to prototype an on-demand DEI audit toolkit for US newsrooms based on AI and NLP technologies, funded partly by the Google News Initiative and Facebook Research. This panel will discuss the "What, So What, and Now what" of technology solutions for DEI audits from an opportunities and guardrails perspective.

Saturday, September 10 14:35 - 15:05 (America/Los_Angeles)

K5: Keynote: Minimizing the Ecological Footprint using Machine Learning

**Rooms:** SCDI 1302, SCDI 1308

Vishnu S. Pendyala, San Jose State University

Ecological footprint is a measure of the use of all forms of nature, including energy, for humans to continue their day-to-day living. Ecological footprint per capita is one of the most widely recognized indicators of environmental sustainability and the world today is concerned about this sustainability. Machine Learning has been significantly applied in the critical areas of ecological sustainability and social innovation.
This talk will highlight some of these applications such as to predict and analyze the ecological footprint, optimizing transportation logistics, and waste management. Societies rely heavily on energy as it aids in human sustainability. Carbon footprints make up a large part of the ecological footprint primarily because of energy consumption. Energy consumption and associated CO2 emissions around the world have increased rapidly in the past few decades due to the rising population and living standards.

The talk will also focus on how Machine Learning is used in the renewable energy sector, which is critical to sustainable progress. The talk will conclude with some possible future directions.

**Saturday, September 10 15:05 - 15:20 (America/Los_Angeles)**

**B6: Break**

**Saturday, September 10 15:20 - 17:30 (America/Los_Angeles)**

**SATS6: Quality Education (SDG4)**

**Room:** SCDI 3302

Chair: Pritpal Singh (Villanova University, USA)

15:20 **Technology Applications in Teaching at the Right Level Programs**

John Gershenson and Edward Amoah (Penn State University, USA); Mumbe Mwangangi (Nyansapo, USA); Tanish Rastogi, Emily Snow and Lauren Werner (Penn State University, USA)

15:45 **Community Capacity Building: A Renewable Energy Workshop as an Investment in Sustainable Businesses in the Galapagos Islands**

Viviana Villavicencio, Javier Urquizo and Pritpal Singh (Villanova University, USA); David Lansdale (Beyond Chacay Foundation & USFQ, Ecuador); Cesar Martin (Escuela Superior Politécnica del Litoral, Ecuador)

16:10 **Save Tuba: A Gamified App for Children to Explore Environmental Issues and Develop Sustainable Behaviors**

Allan F Santana, Trevor A Lachman, Dariia Tyshchenko, Samir Hassan, Arlan J Dawdy, Artur Poole, Nada Stojanovic and Naakesh N Gomanie (Lehigh University, USA); Ekaterina Abramova, Tamirlan Kabetov, Karina Kabiyeva, Yuliana Kolossova, Rumilya Kurbanova, Karina Kadyrbulat and Aigerim Muratbekova (Almaty Management University, Kazakhstan); Khanjan Mehta (Lehigh University, USA)

16:35 **Design and Deployment of Content Stacks and Portable Asynchronous Learning Platforms for Socially Distanced Learning in a Pandemic or Post Disaster Situation**

Joselito Christian Paulus M. Villanueva Mark Anthony Melendres, Catherine Genevieve Lagunzad, Nathaniel Joseph C Libatique and Carlos Oppus (Ateneo de Manila University, Philippines); Jaime Luis E Honrado (Ateneo de Manila University & Skyeye, Inc.,
SATS7: Good Health and Well Being (SDG3)

Room: SCDI 2302

Chair: Noah Weaver (Lehigh University, USA)

15:20 The Impact of Social Media Use on Young Adults' Quality of Life During the COVID-19 Pandemic in South India
   Johanna Sophie von Lieres (Amrita Vishwa Vidyapeetham, India); Gopakumar Cauvery (Amrita Vishwa Vidyapeetham, Amritapuri, India)

15:45 On-Device Prediction for Chronic Kidney Disease
   Alex Whelan and Soham Phadke (Santa Clara University, USA); Alessandro Bellofiore (San Jose State University, USA); David C Anastasiu (Santa Clara University, USA)

16:10 The Impact of Ebola and COVID on the Provider-Patient Relationship in Sierra Leone's Maternal Health Care System: Cues for Technology Innovation
   Masuma Moravej, Isabelle Glazer, Naakesh N Gomanie and Khanjan Mehta (Lehigh University, USA)

16:35 A Narrative Review of Demand Generation Strategies for Family Planning in Low- and Middle -Income Countries
   Matthew T Rivera, Kayla Miller, Naakesh N Gomanie and Khanjan Mehta (Lehigh University, USA)

17:00 Gaia VR: A Virtual Reality-based Neuro and Biofeedback Meditation Application
   Szu-Yun Wang, Hyeon-Seok Bang, Yiding Liu, Minjee Kim and John Raiti (University of Washington, USA)

Saturday, September 10 15:20 - 17:00 (America/Los_Angeles)

SATS8: Agriculture & Food Security (SDG2)

Room: SCDI 2301

Chair: Adil Usman (National Renewable Energy Laboratory, USA)

15:20 Remote Crop Disease Detection Using Deep Learning with IoT
   Ivy Chung, Anoushka Gupta and Tokunbo Ogunfunmi (Santa Clara University, USA)

15:45 Empowering Middle-Aged Women to Bolster Food Security in their Communities
Maya Neumann, Ella Varano, Shreya Chawla, Naakesh N Gomanie and Khanjan Mehta (Lehigh University, USA)

16:10 *Smallholder farmer-centric integration of IoT and Chatbot for early Maize diseases detection and management in pre-visual symptoms phase*

Theofrida Julius Maginga (University of Rwanda & Sokoine University of Agriculture, Rwanda); Jimmy Nsenga (Self-employed & Jimmy NSENGA, Belgium); Pierre Bakunzibake and Emmanuel Masabo (University of Rwanda, Rwanda)

16:35 *UAV-assisted Multi-modal Detection and Severity Assessment for Red Spider Mites in Tea*

Swagatam Bose Choudhury, Sanket Junagade, Sanat Sarangi and Srinivasu Pappula (Tata Consultancy Services, India)

**SATS9: Decent Work and Economic Growth (SDG8)**

**Room:** SCDI 1301

Chair: Thomas Coughlin (Coughlin Associates, USA)

15:20 *Promoting Inclusive Work with Digital Assistance Systems: Experiences of Cognitively Disabled Workers with In-Situ Assembly Support*

Mario Heinz-Jakobs (OWL University of Applied Sciences and Arts, Germany); Anja Große-Coosmann (Wertkreis Gütersloh gGmbH, Germany); Carsten Röcker (OWL University of Applied Sciences and Arts, Germany)

15:45 *Humanitarian Technology Due Diligence, Part II, United Nations SDGs 5 (gender equity) and 8 and 10 (economic equality)*

LaVonne Reimer (Descant Labs, USA)

16:10 *A sociotechnical analysis of interventions to promote safer working conditions in informal e-waste recycling settings*

Sofia Lara Schlezak (Colorado School of Mines, USA); Juan Lucena (Colorado School of Mines & Humanitarian Engineering, USA); Alina Handorean (Colorado School of Mines, USA); Luciana Antolini (Autoridad de Cuenca Matanza-Riachuelo (ACUMAR), Argentina); Richard Neitzel (University of Michigan, USA); Oscar Restrepo Baena (Universidad Nacional de Colombia, Colombia)

**Saturday, September 10 18:00 - 21:00 (America/Los_Angeles)**

**BQ: Conference Banquet**

**Room:** Locatelli

Remarks: SCU Speaker; Tim Lee (IEEE R6); Tom Coughlin (IEEE CNSV & IEEE SSIT); Winncy Du (IEEE SCV); Stephanie Gillespie (IEEE EPICS)
Sunday, September 11

Sunday, September 11 8:00 - 9:00 (America/Los_Angeles)
BKSU: Breakfast

Sunday, September 11 9:00 - 9:30 (America/Los_Angeles)
K6: Keynote: Does Gender Impact Startup Funding Success? A Data-Driven Perspective
Rooms: SCDI 1302, SCDI 1308
Maya Ackerman, Assistant Professor of Computer Science and Engineering, Santa Clara University

Research has long demonstrated the benefits of diversity for team performance, including startup success. Nevertheless, investors remain less likely to invest in women compared to their male counterparts. This talk will share data-driven research findings that shed light on the nature and extent of gender bias in venture capital allocation. Solutions for lasting change will be discussed.

Sunday, September 11 9:35 - 10:05 (America/Los_Angeles)
K7: Keynote: How the Internet Improves Humanity
Rooms: SCDI 1302, SCDI 1308
Eric Goldman, Professor of Law, Santa Clara University

Given the time and energy we spend worrying about the Internet’s flaws, it's easy to forget how the Internet makes our lives better in many ways. This talk will highlight one underappreciated aspect: how the Internet has the capacity to improve the human species by increasing pro-social interactions and reducing anti-social ones. The talk will also show how this scenario probably won't be realized because of misguided regulatory efforts to "fix" the Internet.

Sunday, September 11 10:10 - 10:50 (America/Los_Angeles)
PNL3: Panel: Web3 and Human Rights
Rooms: SCDI 1302, SCDI 1308
Moderator: Michael Kleinman, Director, Silicon Valley Initiative, Amnesty / AIUSA
Panelists:
• Lia Holland (Campaigns and Communications Director, Fight for the Future)
• Mai Ishikawa Sutton (Co-founder and editor of COMPOST, an online magazine about the digital commons, as well as a Digital Commons Fellow with the Commons Network and a contributor to the Internet Archive's work on the decentralized web)
• Nathan Schneider (Assistant Professor, Media Studies at the University of Colorado Boulder and Director, Media Enterprise Design Lab)

The internet in the West today is dominated by a handful of companies, including Amazon, Apple, Google, Meta (Facebook), Microsoft, TikTok, and Twitter. Each company sets the terms and conditions for how individuals engage with their platform and can potentially ban them according to those terms, including for their speech. In return for free access to these platforms, individuals provide personal information and effectively lose control over that information. In some countries, governments have pressured tech companies to censor and provide information on individuals and groups that the government disfavors.

Web3 - sometimes called the Distributed Web - potentially represents a fundamental change in this dynamic, especially as regards the question of control. The number "3" implies a specific historical view of how the web evolved, from an initial "open" state in the 1990s and early 2000s (web1) towards ever greater corporate centralization and power, leading to the dominance of a handful of Big Tech corporations today (web2). It posits web3 as the next step in this evolution, towards a more decentralized future, in which our online experience is not shaped (or not only shaped) by these companies.

This panel will examine the positive and negative implications that web3 has for human rights, including access and equity, privacy, social mobilization online, and other issues.

Sunday, September 11 10:50 - 11:00 (America/Los_Angeles)

B7: Break

Sunday, September 11 11:00 - 12:00 (America/Los_Angeles)

SUTS1: Quality Education (SDG4)

Room: SCDI 3302
Chair: Pritpal Singh (Villanova University, USA)
11:00 LATAM Intelligent Filter for Education (LIFE): A Modular Water Purification and STEM Education Tool
Linnea Y Rothi, Nicole Mossing, Emily Nakata, Jordyn Quesenberry, Cinthya Jauregui, Andrew Lemus, Daniel McCann-Sayles, Jonathan Woo, Edison Yang, Michele Parker, Jes Kuczenski and Kourosh Pahlavan (Santa Clara University, USA)
11:25 Implementation of the STEAM Method to motivate and inspire primary and secondary school students in Colombia to pursue space science research, NASA Human Exploration Rover Challenge (HERC) 2020, 2021, 2022 Project Case Study

Tito Alberto Nuncira Gacharna, Erick David Daleman Amaya, John Alvaro Rueda Forero, Joaquin Jose Avila Pallares, Wendy Avila, Miguel Reyes Parra, Catalina Marcela Rodriguez, Leidy Soler Arias, Yeison Javier Fonseca Rojas, Fanhor Navia Forero, Nicolas Carvajal Restrepo, Augusto Cubillos Cuadros, Manuel Arturo Gonzalez Parra, Ruben Dario Lozano Quecan, Julio Andres Salgado Reyes, Manuel Amezquita Pulido, Samuel Alejandro Nuncira Lopez, Juan Pablo Morales Arias, Nelson Alberto Forero Rincon and Maria Eugenia Lambertinez Rivera (Universidad ECCI, Colombia)

SUTS2: Good Health and Well Being (SDG3)

Room: SCDI 2302

Chair: Eric Rasmussen (Infinitum Humanitarian Systems & School of Public Health, University of Washington, USA)

11:00 Santé le Match: A mobile health game application to educate the youth of Senegal
Shelby Tadaki, Reha Shah, Michele Parker, Krizia Araracap, Evan Chou, Matthew Tolosa, Silvia Figueira, Carly Kellner and Kristina Yin (Santa Clara University, USA)

11:25 Deep learning-based models combined with different optimization methods for the automatic diagnosis of melanoma skin cancer
Radhika Goyal (Lynbrook High School, USA)

SUTS3: Technologies that promote gender equality and the empowerment of women and girls (SDG5)

Room: SCDI 2301

Chair: Kathleen A Kramer (University of San Diego, USA)

11:00 Animalogy: Learning through Analogy and Technology
Naomi-Tida Essers, Dries Rutten and Syed Jaffar Mujtaba (KU Leuven, Belgium)

11:25 Empowering Women in Low-income Communities in Colombia by Recycling Construction and Demolition Waste
Jaime E Styer (Colorado School of Mines, USA); Juan Lucena (Colorado School of Mines & Humanitarian Engineering, USA); Lori Tunstall and Elizabeth Reddy (Colorado School of Mines, USA); Jason Ideker (Oregon State University, USA)
SUTS4: Affordable & Clean Energy (SDG7)

Room: SCDI 1301

Chair: Kellen B Kennedy (University of Colorado at Boulder, USA)

11:00 *Experimental Design for Measuring the Effect of Soiling on Power Production of Solar Panels in Ghana*

   Takudzwa Kampira (Ashesi University, Ghana); Stewart Isaacs (Massachusetts Institute of Technology, USA); Heather R Beem (Ashesi University, Ghana)

11:25 *Design, Fabrication, and Aerodynamic Testing of a Vertical Axis Wind Turbine (VAWT) for Berekuso, Ghana*

   Trish A Maduche and Heather R Beem (Ashesi University, Ghana)

Sunday, September 11 12:00 - 13:00 (America/Los_Angeles)

L3: Lunch

Sunday, September 11 13:00 - 13:50 (America/Los_Angeles)

PNL4: Panel: IEEE HAC Capacity Building

Rooms: SCDI 1302, SCDI 1308

Moderator: Pritpal (Pali) Singh, IEEE Humanitarian Activities Committee

Panelists:

- Sampathkumar Veeraraghavan, Global Chair, IEEE Humanitarian Activities Committee
- Lwanga Herbert, Chair, IEEE SIGHT Steering Committee

This session will present various global programs offered by HAC and the best practices for the design and development of the IEEE HAC/SIGHT sustainable development program. The audience will have an opportunity to network and learn about the successfully implemented HAC projects.
PROGRAM SESSIONS

Sunday, September 11 14:00 - 14:30 (America/Los_Angeles)

P6: Plenary: Clean energy solutions replacing portable fossil fuel generators: Technology and lessons from Ukraine and Hurricane Ida

Rooms: SCDI 1302, SCDI 1308
Paul Shmotolokha, New Use Energy

This presentation will show the progress of highly mobile alternatives to using portable fossil fuel generators in disaster or humanitarian relief efforts to provide critical power when the grid is down or where it does not exist. First I will examine the use cases and dynamics of where power is commonly needed citing disaster relief and medium term support after Hurricane Ida. We will then examine humanitarian assistance examples in Ukraine supporting both internal and international refugees as well as communications, medical, municipal and relief organizations. From a technology perspective, it will focus on safe and energy dense Lithium Ion batteries, generation options with a focus on lightweight solar, refrigeration, weatherization, power conversion, and ability to scale towards larger longer lasting microgrids. The difference between portability and mobility, Cost models, Speed of deployment, re-use and Logistics lessons will be covered.

Sunday, September 11 14:30 - 14:50 (America/Los_Angeles)

CLS: Closing Remarks and GHTC 2023 Preview

Rooms: SCDI 1302, SCDI 1308
Dr. Behnam Dezfooli and Dr. Elizabeth Belding, Dr. Pritpal Singh

Sunday, September 11 14:50 - 15:10 (America/Los_Angeles)

B8: Break

Sunday, September 11 15:10 - 17:00 (America/Los_Angeles)

SUTS5: Clean Water & Sanitation (SDG6)

Room: SCDI 3302
Chair: Avery J Lu (IEEE Consumer Technology Society, Santa Clara Valley - Silicon Valley & Aventurine Capital Management, LLC, USA)
PROGRAM SESSIONS

15:10 *A Community Water System Mapping (CWSMap) Platform for Supporting Rural Water Operators*
Andy Florian Irakoze and Flavio Esposito (Saint Louis University, USA); Andrew Schranck (Global Health Engineering, USA); Lee Voth-Gaeddert (University of the Witwatersrand, USA)

15:35 *Water Access in the Unhoused Setting of Portland, Oregon: Overlooked and Impactful*
Emma F. Chapman (Colorado School of Mines, USA)

16:00 *M3MLF: Mapping, Measuring and Monitoring Using the Machine Learning Framework for Dynamic Water Source Classification*
Amritanand S (Amrita Vishwa Vidyapeetham, India); Ashwin Shenoy (Amrita Vishwa Vidyapeetham, India); Megha C (Amrita Vishwa Vidyapeetham, India); A S Reshma (Amrita School for Sustainable Development, Amrita Vishwa Vidyapeetham, India); Rekha P (Amrita Vishwa Vidyapeetham, India)

**Sunday, September 11 15:10 - 17:20 (America/Los_Angeles)**

**SUTS6: Good Health and Well Being (SDG3)**

**Room:** SCDI 2302

Chair: Taylor Winship (IEEE SCV SSIT, USA)

15:10 *Design of an affordable lower limb bionic prosthesis*
Maximiliano N Palay and Rafael Sotelo (Universidad de Montevideo, Uruguay)

15:35 *Detection and Low-Latency Notification of Improper Backpack Posture using Deep Learning*
Hsin-Ya Hung and Garrett Millaway (University of Washington, USA); Saif Mustafa (University of Washington & Global Innovation Exchange, USA); Haonan Peng, Avi Geiger and John Raiti (University of Washington, USA)

16:00 *A Wearable Device For Postoperative Breast Cancer Rehabilitation With Machine Learning For Motion Tracking*
Yunfan Zhao, Carl-Michael Adams, Tantai Davis and Jiaxin Zhao (University of Washington & Global Innovation Exchange, USA); Niall O'Rourke (Western Washington University, USA); Haonan Peng, Avi Geiger and John Raiti (University of Washington, USA)

16:25 *A Gamified Approach to Cognitive Assessment with Machine Learning Based Predictions*
Alexander C Simpson, Yongjie An, Jacob Estep, Abhijeet Saraf and John Raiti (University of Washington, USA)

16:50 *Assisted Mobility: an application to help the blind to use public transport*
Victoria Tejera, Valentina Kunze, Stephanie Mendonça and Cristina Mayr (Universidad de Montevideo, Uruguay)
SUTS7: Technology Impacts on Societal Evolution

Room: SCDI 2301
Chair: Ananya Gopal (Santa Clara University, USA)

15:10 Pedal ‘n Spin Foot-cranked Washing Machine Innovation
Kai Goodall, David Oyedokun and Pitambar Jankee (University of Cape Town, South Africa)

15:35 Slums in Smart Cities - Rethink the Standard
John Friesen and Martin Pietsch (TU Darmstadt, Germany)

16:00 Extraction of Reliable and Actionable Information from Social Media During Emergencies
Mohammadbagher Fotouhi, Wei Cheng and Payman Arabshahi (University of Washington, USA); Haixun Wang (Instacart, USA)

16:25 Climate-Focused Field Research Within the Kwajalein Atoll Sustainability Laboratory
Eric Rasmussen (Infinitum Humanitarian Systems & School of Public Health, University of Washington, USA); Gregg Nakano (Infinitum Humanitarian Systems, USA); Kitlang Kabua (Minister of Education, Marshall Islands); Alex Hatoum (Infinitum Humanitarian Systems, USA)

SUTS8: Affordable & Clean Energy (SDG7)

Room: SCDI 1301
Chair: Kellen B Kennedy (University of Colorado at Boulder, USA)

15:10 Selection of multicriteria decision analysis methods for electrification projects in rural Sub-Sahara Africa - A case study in Niger
Julian Huwer (Cologne University of Applied Sciences & University of Saarland, Germany)

15:35 Installing Solar for Haitian Civil Society with Emphases on Maintenance and Empowerment
Brian Thomas and Kayla Garrett (Baylor University, USA)

16:00 Optimizing Renewable Energy Share in Remote Areas Microgrids and Its Trade-off to Cost
Ilman Sulaeman, Amalia Suryani and Niek Moonen (University of Twente, The Netherlands); Jelena Popovic (University of Twente & Klimop Energy, The Netherlands); Frank Leferink (University of Twente, The Netherlands)

16:25 Design of a Dust Cleaning Machine to Reduce Dust Soiling on Solar PV Panels in Ghana
Issahaku Walaman-i (Ashesi University, Ghana); Stewart Isaacs (Massachusetts Institute of Technology, USA); Heather R Beem (Ashesi University, Ghana)
Safety for Autonomous Vehicles: Addressing Interoperability and Dependability Challenges with IEEE P2851
Speaker: Jyotika Athavale, NVIDIA

The IEEE P2851 standard defines a dependability lifecycle of products with focus on interoperable activities related to functional safety and its interactions with reliability, cybersecurity, SOTIF (Safety of the intended functionality) and real time. The standard also describes methods, description languages, data models, and databases that have been identified as necessary or critical, to enable the exchange/interoperability of data across all steps of the lifecycle encompassing activities executed at IP, SoC, system and item levels, in a technology independent way across application domains such as automotive, industrial, medical and avionics safety critical systems. The speaker, who is the chair of the working group on the standard will provide more insights into the topic.